

# Consciousness! It's Only a Model

Sh!

*by Dana Bryan Jones*

All we ever really deal with are models. To say a thing is or isn't actually a thing could really be utter nonsense. Even the words 'consciousness' and 'reality' are just models. They are words that are part of a language that we developed and use to communicate our thoughts and ideas to one another. We all know this but it's something that's easy to take for granted.

I'm not trying to convince anyone of my beliefs about the nature of consciousness and reality (at least not yet 😊) I just want to bring more awareness to the idea that models of consciousness and reality are just that: models. Trying to eat the menu instead of the meal or attempting to travel the map instead of the territory are classic examples of what I'm talking about. I don't feel it's necessary to try to prove that my ideas are right and someone else's are wrong. I'd rather explore the different models that are proposed and see which ones are useful under which circumstances and/or for what purposes or simply what resonates with me. If, at some point, I decide to create my own model to share with the world then I hope it will be taken as such... a model. And then, of course, I'll set about proving everyone else wrong 😊.

Models help us make sense of whatever it is that's being modeled. They won't ever be (or at least probably *shouldn't* be) full representations but they are often useful in determining what we are dealing with and how we should attempt to use it as successfully as possible. Models of consciousness and reality vary widely and have been developed by many different people across time and space. Since many of these models break consciousness and/or reality into levels, stages, or sections one of the many challenges is maintaining a holistic view and not losing sight of the purpose of that particular map by giving one 'level of reality' too much attention at the expense of the others.

There is far too much to be said about each of the following topics to fit into one book, let alone one article, so this will necessarily be a basic and oversimplified overview of some of the models I find interesting and worthy of deeper attention. At some point in time I may give each of topics the below, give or take a few, a more thorough investigation and report.

Though it's certainly not necessary, I've chosen to go in a rough chronological order beginning at the beginning (of course) with some 'native' thoughts and follow that through into the 'New Age' towards the end.

## **Nine Underworlds and the Mayan Calendar**

Around 2000 BCE the Mayans seemed to have found it reasonable to separate consciousness into nine levels called underworlds. These levels are represented in what's called the cosmic pyramid and, from the bottom up, they are Cellular, where matter and physical laws begin, Mammalian, which focuses on survival and stimuli and response, Familial, which awakens the recognition of the family unit, Tribal, where the focus is on the ability to observe what is the same or different between or among us, Cultural, where we begin to build our cultural experience, National, which brings us to the laws of civilization. The Planetary underworld gives us science because we now begin to notice the laws of nature, Galactic guides the moral compass for humanity, and Universal will bring us all back together as The One Consciousness... more or less.

There are so-called physical representations of these pyramids in the form of the Temple of the Jaguar, the Pyramid of the Plumed serpent, and the Temple of the Inscriptions all in what was known as Mesoamerica that spanned from what is now central Mexico, through Central America and almost into South America. Each level seems to correspond not only to personal consciousness development but also to the development of reality itself, or Cosmos, and of the consciousness of humanity as a whole. It appears the Maya believed consciousness to be the fundamental unit of Cosmos.

The levels are broken into consecutive blocks of time and they begin roughly 16.4 billion years ago, around the time it is said our universe began, and end in 2011. This actually seemed to

generate a lot of hubbub about the world ending in 2012 (some interpretations put the end at 2011 and some at 2012, but on a cosmic time scale it seems silly to argue that point; consider that I say 16.4 billion years ago is 'close to' 13.799 billion years ago which appears to be the current agreed upon age of our universe, give or take several million years). It is said that these levels are strongly linked to the Mayan calendar and that this calendar was going to end in 2011/2012 not because the world was ending but because we would be entering the last phase of the evolution of human consciousness. This new wave or phase, the Universal, is supposed to enable us to co-create a unity consciousness.

The calendar is sometimes reported to be more of a metaphysical map used to navigate the evolution of human consciousness rather than a calendar of astronomical or celestial events. So, it's not that specific events at specific times in history will trigger the next phase of our consciousness evolution but rather that after a certain amount of time we, ourselves, are ready to begin that process. However, we have to willingly align ourselves with this change and actively participate in this evolution.

## **Nondualism**

Now this is a subject that already has numerous volumes devoted to its study and it is something I will certainly touch on again so here is a very brief overview. Nondualism seems to be a very popular concept in Eastern philosophies like Hinduism and Buddhism. It is the belief that there is but one entity, namely, the universe. While it's acknowledged that there seem to

be 'other things' 'out there' like your car, your house, other people, etc. they are all essentially without existence outside of the context of the whole universe. Basically, nothing exists without everything else, therefore there is but one thing.

Everything that we see, hear, smell, feel, and taste, all of our experience is an interaction between the unchanging eternal, the Consciousness, if you will, and the temporary, ever-changing material world. This eternal is sometimes known as Brahman: "...that which does not change but is the cause of all changes"; it is the cause of all things. The individual, the self, is likewise sometimes known as Atman. The Atman is not limited to humans, but extends to all living things animal and plant alike. It is the eternal within us. The illusion of the material world that Atman experiences is sometimes referred to as Maya and Maya is an illusion. In this sense, though, the illusion is not that the material world isn't real, it's just that it's not what it seems to be. This is a topic I will indeed revisit.

### **Ego, Id and Super-Ego**

A very popular model in the West is Freud's psychic or mental apparatus which is comprised of the Ego, the Id, and the Super-Ego. This model grew out of and expanded upon his earlier model consisting of the unconscious, the preconscious, and the conscious. To a large extent this model seems to still greatly influence how we think about the subject today. And, in the spirit of this article, I'd like to point out that Freud says "...our hypothesis set out to be no more than graphic illustration." 😊

We take the existence of our unconscious mind for granted, but in the late 19<sup>th</sup> century Freud had to work very hard at getting people (in the Western scientific community) to take the idea seriously. During the course of his psycho-analytical work, Freud reasoned that there must be more to the mind than what we find as immediately obvious, something that our conscious mind wasn't usually aware of. He was exploring the depth of the mind or "depth-psychology". In the dreams of healthy people and in the obsessions of the ill he found evidence of something more than meets the mind's eye. When a thought pops into your head and you don't know where it came from or when you come to some intellectual conclusion and you don't know quite how, they must come from somewhere. He says: "...at any given moment consciousness includes only a small content, so that the greater part of what we call conscious knowledge must in any case be for very considerable periods of time in a state of latency, that is to say, of being psychically unconscious." In the introduction of one edition of Freud's essay, "The Unconscious", the editor proclaims "[m]ental events are like pearls on an invisible chain, a chain largely invisible precisely because many of the links are unconscious."

It seems Freud figured there had to be a kind of staging area for the unconscious to unload its goods to the conscious mind. On their journey from the deep, thoughts would pass into the preconscious mind. As they crossed this barrier they were judged by an internal censor and waited to be released into conscious awareness or be forgotten, perhaps to make the journey again some other time though (not completely unlike the journey of a photon trying to leave

the sun, eh? Check back in a few years to see if I ever finish the book 'After Forever', then you'll get the reference! 😊). There are also the conscious events that make their way to the preconscious and though we're no longer presently aware of them, that's where they sit while they're waiting to be deemed repressible and sent to the unconscious or suitable for re-integration with our waking mind.

Although he didn't base his psychical topography on the actual structure of the brain, Freud did seem to think of it as somehow physical: "...it has reference not to anatomical localities, but to regions in the mental apparatus, wherever they may be situated in the body." Even though he knew that substantial research had shown that mental activity is inextricably linked to the brain like it is with no other organ and that there was clear evidence showing that different parts of the brain related to different parts of the body and different mental events, every attempt to localize mental processes or find ideas stored in "nerve-cells" that travelled "nerve-fibres" had failed.

Freud proposed that the unconscious consists of instinctual representatives that want to be actualized, basically wishful impulses. I think searching further along this path helped him realize that the model of the unconscious, preconscious, and conscious mind was, alone, insufficient to handle the complexities of the human mind.

As the coherent organization of our mental processes the ego is what our consciousness is attached to and consciousness is the surface of the mental apparatus; this is the first part of the system that stimuli from the external world encounter. And derived from bodily sensations the ego represents the projection of the self. So, as far as we're concerned, on a waking level, we seem to be our egos.

He determined that things we perceived externally through our senses and internally via feelings and sensations are immediately conscious. There were internal thought processes, however, that he called "...displacements of mental energy..." that emanated from somewhere within the mental apparatus. He wondered if this mental energy making its way to the surface was what generated consciousness or if consciousness was somehow already there and sought this displacement. While he decided that neither of these seemed likely and that there must be a third alternative, I've not yet found if he discovered what it was. Much to learn, I still have!

Freud believed we are "lived" by unknown and uncontrollable forces that basically reside in the id. The id is the instinctual unconscious we are born with and it has no censor, no bridle. That is, of course, until our ego develops. The ego is developed out of the id. It is the id experiencing the external world and realizing there are rules and limitations. The ego "...is that part of the id which has been modified by the direct influence of the external world..." through conscious perception. In the ego it's all about perception while in the id it's all about instinct. While the ego represents common sense and reason, the id represents passion. Freud compares the ego's



relationship with the id to that of a human riding a horse: sometimes, while trying to control the movements of something with far superior strength the best you can do is guide it to where it wants to go.

If we picture the classic image of the mind as an iceberg with the unconscious being the 90% of it under the water and the conscious being the 10% of it above, we need to consider something above this that is also unconscious... hmmm, what happened here? OK, so further along in the course of his psycho-analytical work Freud discovered that we have a “higher” portion of the ego that is also mostly unconscious that contains things like self-criticism and that unconscious sense of guilt: the super-ego. The super-ego is basically our conscience, the part of us that tells us we could, and should, do better. It’s also known as the ego ideal and is a modified section of the ego that challenges the ego’s contents. He claims the super-ego is originally born out of our repressing the Oedipus complex... and, yeah, sorry, I’m not getting into that here 😊. The super-ego is the higher nature in humanity “...it represents the most important characteristics of the development of both the individual and of the species.” He even goes so far as to say “...it contains the germ from which all religions have evolved. The self-judgement which declares that the ego falls short of its ideal produces the religious sense of humility to which the believer appeals in his longing.”

Freud theorized that we inherit our id and that it could possibly be the egos of the countless generations before us. And that when the ego, formed from the id, forms the super-ego "...it may perhaps only be reviving shapes of former egos and be bringing them to resurrection."

### **A Spectrum of Consciousness**

Brought to us by Ken Wilber he likens consciousness to the electromagnetic spectrum and calls it the Spectrum of Consciousness. In his attempt to integrate what he says are commonly termed 'Western' and 'Eastern' psychologies or philosophies he argues that the explorers of consciousness are not typically opposing one another but rather examining different bands of the same spectrum. In his model, each band has its own purpose and its own particular strengths and weaknesses and that, ultimately, they can be used in a complementary fashion. "Although there are numerous important exceptions, the general consensus of the Western scientific community is that the 'Eastern' mind is regressive, primitive, or at best, just plain feeble, while the Eastern philosopher is apt to reply that Western scientific materialism represents the grossest form of illusion, ignorance, and spiritual deprivation." And when he says that consciousness is a spectrum or that it is "...composed of numerous bands or vibratory levels..." he doesn't mean it literally but that it's useful to think of it that way "...for the purposes of communication and investigation..."

There are three major bands: The Level of Mind, the Existential Level, and the Ego Level. There are four minor bands: The Transpersonal, the Biosocial, the Philosophic, and the Shadow.

Unfortunately, I found I was a little confused because at times he refers to the Shadow level as part of the minor group of bands: “The minor bands being the Transpersonal, the Biosocial, the Philosophic, and the Shadow Levels.” But at other times he refers to the Shadow bands as their own major level. For instance, while building up the evidence for the evolution of the Shadow level he concludes that it “...marks the creation of the final major level of the spectrum of consciousness, a level that Jung called the *Shadow*...” I feel it’s a minor point really, but I don’t want you to go read his book and then call me out on that 😊!

To begin, however, what we need to understand first is dualism (yeah, that’s right, the opposite of the nondualism from above). When we separate ourselves from the rest of the universe we begin our journey along the path of being able to see this spectrum. Subject and object, organism and environment, I and you; these are dualisms. At the Level of Mind, there is no separation (nondualism), there is no you, no I, no them, no that; it all just is. But then this first round of dualism kicks in and we notice that we do not seem to be our surroundings, there are other things out there: a table, a chair, another person, etc. Now we head into the Existential Level where we truly begin to acknowledge our existence. But then, we see another shift, another round of dualism where we see that our body is not our mind, we have a body, we have thoughts and feelings, there is this other separation within ourselves that then creates the Ego Level. At the Ego Level, we separate further still, noting that there are parts of our self that we’d rather not identify with and we project them onto our environment and/or other people. This is where we’ll find the Shadow Level. “Thus the entire spectrum of consciousness evolves.

It is an evolution most easily followed by noting Man's *identity* at each level, for each major dualism results in a progressively narrowed and restricted sense of identity, from the universe to the organism to the ego to parts of the ego."

And, much like Freud's 'ego' the Ego Level here is basically our view of our self; our mind, our intellect, and the mind's perception of itself. The Existential Level is our whole being, our whole existence; it's our ego within the context of what we believe we know about our world based on how we've been affected by our cultural upbringing. The Level of Mind provides our sense of oneness, our sense of belonging to the universe, to everything else that we can see, hear, smell, touch, and taste; it "...is commonly termed mystical consciousness..." "So where the Ego Level includes the mind, and the Existential Level includes both the mind and the body, the Level of Mind includes the mind and the body, and the rest of the universe."

The Transpersonal bands are "...between the Level of Mind and the Existential Level..." it's "...where the boundary between self and other has not been completely crystallized..." and where Jung's collective unconscious, ESP, astral projection, out-of-the-body experiences, and things of this nature fall on the spectrum. It's important to note that he doesn't claim to know whether or not these occurrences exist but rather, if they did, this is where he thinks they'd be on the spectrum. While Wilber says the Biosocial bands are mostly just above the Existential band he seems to mostly consider that they "...represent the upper limits of the Existential Level." This is the band where our cultural upbringing filters all of our experiences, where "...the

cultural premises of an organism are absorbed, and these premises color all subsequent transactions between the organism and the environment.” And further, “...in short, it dictates broad guidelines for an organism’s overall behavior.” He explains that we each carry “...a vast network of relations that represents society ‘internalized’.” The most basic characteristics of this network are language and logic: “...the Biosocial Band, as the repository of sociological institutions such as language and logic, is basically, fundamentally, and above all else a matrix of distinctions...” and it’s so much a part of how we perceive things that we’re typically not even aware of it. In a similar fashion, the Philosophic band is where our basic and deepest assumptions about the world exist. “In their broadest sense, the philosophic bands are simply a personal matrix of distinctions, over and above the social matrix of distinctions constituting the Biosocial Band.” They serve to act as a type of “...personal filter which screens out those experiences which are inconsistent with its mesh.” Moving onto the Shadow Level, in this final act of dualism, we separate the parts of our self that we don’t want to identify with, “...all of the unwanted and undesirable aspects of our selves that we attempt to discard but which nevertheless follow us as our own Shadow.” Again, this is something so close to the metal, so deeply held, that we don’t even realize we’re doing it so we’re often scarcely aware of it.

Just like the empirical studies of the Western scientific method, Wilber claims the “Eastern disciplines... are primarily a set of experiments in the strictly scientific sense of that term.” And that “...if carried out properly, will result in the discovery of the Level of Mind.” When speaking of those that explore the Level of Mind he says: “...their opinions are impressively universal and unanimous; transcending the ego is not a mental aberration or a psychotic hallucination but

rather an infinitely richer, more natural, and more satisfying state or level of consciousness than the ego could imagine in its wildest flights of fantasy.”

I agree with his sentiment that one who confines him or herself to one level, or even to one model, of consciousness and denies that others are possible is almost surely missing something important. By viewing consciousness as a spectrum, he claims we can find the “...hidden semblance of order...” so “...it becomes possible to integrate, in a fairly comprehensible fashion, not only the major schools of Western psychotherapy, but also what are generally called ‘Eastern’ and ‘Western’ approaches to consciousness.”

He proposes that in order to use this model “...we must necessarily view the individual self as – in a certain sense – an illusion and its world as a dream. This does not denigrate Western approaches at all, however, for even if Eastern disciplines can awaken us from this dream, Western ones can, in the meantime, prevent it from becoming a nightmare.”

### **Eight-circuit Models**

Both Timothy Leary and Robert Anton Wilson have written extensively about an eight-circuit model of consciousness. Wilson acknowledges that his version is derived from Leary’s and he builds upon it (and thoroughly acknowledges Leary) in his book, *Prometheus Rising*. That is the model we will be focusing on in this article.

And in said book, the author says he will “...consider the human brain a kind of bio-computer – an electro-colloidal computer, as distinct from the electronic or solid-state computers which exist outside our heads.” He makes it very clear that he is not saying the human brain is a computer but that for the purpose of his book it is useful to consider the brain as a computer. While comparing the brain to a computer he introduces the idea that it also has hardware and software and as such “...we all know where the hardware is: it is inside the human skull. The software, however, seems to be anywhere and everywhere. For instance, the software ‘in’ my brain also exists outside my brain in such forms as, say, a book I read twenty years ago...” Of course, it’s not just the books you read that become the software of your brain, but pretty much any experience you’ve had: “Other parts of my software are made up of the software of Confucius, James Joyce, my second-grade teacher, the 3 Stooges, Beethoven, my mother and father, Richard Nixon, my various dogs and cats, Dr. Carl Sagan, and anybody and (to some extent) *any-thing* that has ever impacted upon my brain.”

When it comes to how this truly affects the human condition he states “...if consciousness consisted of nothing but this undifferentiated tapioca of timeless spaceless software, we would have no individuality, no center, no Self. We want to know, then how out of this universal software ocean a specific person emerges.”

Here we have another proponent of quantum actions in the brain: "...the programs get into the brain, as electro-chemical bonds, in discrete quantum stages." And each set of programs has three basic parts:

1. "Imprints. These are more-or-less hard wired programs which the brain is genetically designed to accept *only* at certain points in development. These points are known, in ethology, as times of *imprint vulnerability*.
2. Conditioning. These are programs built onto the imprints. They are looser and fairly easy to change with counter-conditioning.
3. Learning. This is even looser and 'softer' than conditioning."

Coming back to our Self he says "[i]mprints (software frozen into hardware) are the non-negotiable aspects of our individuality. Out of the infinity of possible programs existing as potential software, the imprint establishes the limits, parameters, *perimeters* within which all subsequent conditioning and learning occurs."

He also speaks to how it begins and compares it to religion: "[b]efore the first imprint, the consciousness is 'formless and void' – like the universe at the beginning of *Genesis*, or the descriptions of unconditioned ('enlightened' i.e. exploded) consciousness in the mystic traditions." "Each successive imprint complicates the software which programs our experience and *which we experience as 'reality'*. Conditioning and learning build further networks onto this bedrock of imprinted software. The total structure of this brain-circuitry makes up our map of the world."



And now, onto the eight circuits:

1. *The Oral Bio-Survival Circuit.* This circuit is basically our instinct to stay alive: head towards the nourishment, avoid the threats. We are born knowing how to do this and we associate it with our mother or mothering figure.
2. *The Anal Emotional-Territorial Circuit.* This starts showing up when we become toddlers and it's where and when we figure out where in the 'pack' we fit in. Are we alpha or not? Are we predominantly dominant or submissive? We learn politics here.
3. *The Time-Binding Semantic Circuit.* As we get a little older and learn to read, write, do math, basically learn to navigate our society's system of symbols this circuit becomes active. We create our map of reality that will likely stay with us through adulthood within this circuit.
4. *The "Moral" Socio-Sexual Circuit.* This circuit awakens at puberty when we first become aware of our sex drive. It is the circuit that guides us into adulthood and shapes our perceptions of our role in society against the background of our reality map. We begin to learn our cultural 'rights' and 'wrongs' here.
5. *The Holistic Neurosomatic Circuit.* This circuit will lead us to bliss. It is the circuit that we activate with things like pranayama or other various yoga techniques, or, for some, the ingestion of Cannabis or other similar types of substances. It is where we truly begin our path to the union with the universe.
6. *The Collective Neurogenetic Circuit.* Here we will find the archetypes of Jung's collective unconscious, the Atman consciousness, visions of gods, goddesses, demons, past-life,

reincarnation, etc. This is attained after many years of serious yogic study and practice... or, according to the author, heavy doses of LSD (which is only temporary, though, by the way). This circuit gives us access to the great genetic library within the individual cells being "...the DNA memory coiling back to the dawn of life and containing also the genetic blueprints for the future of evolution."

7. *The Metaprogramming Circuit*. This is the 'soul', to some, the 'no-mind' or the 'creative void' to others... it has many names. "In the Zen metaphor, it is a mirror that reflects anything but does not hold onto anything. It is a conscious mirror that knows it can always reflect something else by changing its angle of reflection." It is the realization that we control what we experience, it "...represents *cybernetic consciousness*; the programmer becoming self-programmer..."
8. *The Non-Local Quantum Circuit*. This is the idea that the universe is but one, undivided system. The author invokes Bell's Theorem and claims "[t]here are no isolated systems; every particle in the universe is in 'instantaneous' (faster-than-light) communication with every other particle." This produces experiences where "...awareness *seems to* escape the confines of the nervous system entirely." According to the author reports of these come from near-death and clinical death cases, sufficiently advanced yogis, and, you guessed it, heavy doses of LSD.

The author considers the first four of these circuits as primitive; all animals have them in some form and they evolved with us over time. The next four, however, are more recent developments and are particular to more advanced forms of life like, say, humans, or, as the

author likes to refer to them (himself included) “domesticated primates”. He says that most humans never reach the fifth circuit and that the ones that do get there mostly do so through what is often referred to as the ‘Dark Night of the Soul’ and it is typically most unpleasant. There are, of course, great benefits to this when they finally wake up in the ...Bright Morning of the Soul? Or so they say.

### **The Holotropic Mind and Holographic Universe**

As the names imply, both of these theories rest upon the mechanisms of the holograph. Stanislav Grof started out as a materialist psychiatrist but was discovering that the ‘Newtonian’ model he was working with wasn’t matching all of his observations. Eventually, he felt compelled to create a model that would explain what he was witnessing. His claim is that there is mind in nature; that consciousness itself plays a role in creating reality. He considers this a revolution in the understanding of the psyche and compares it to that of Copernicus claiming that the Earth is not the center of the universe. Grof is seeking to combine science and ancient wisdom: psychiatric experimentation with consciousness as a fundamental aspect of reality.

With this theory, we again find an approach with levels. There are three levels in this model: the level that is most readily recognizable to us as our waking world he calls the biographical level, then there’s the perinatal level that has to do with the experiences of the trauma of birth, and then the transpersonal level that opens us up to Jung’s collective unconscious and the rest of the universe.

He has a way of organizing memories into what he calls COEX systems, the word COEX coming from “condensed experience”. In this system he claims our experiences are stored as complex constellations that, while having layers, ultimately have a central theme, sensation, and emotional quality. For instance, all of the memories that are of humiliating or shameful events would be contained in one COEX constellation while all of the memories associated with the fear of claustrophobia or suffocation would be stored in yet another.

David Bohm and Karl Pribram might be responsible for the idea that the universe may in fact be a giant hologram created, in part, by the human mind and they came to this conclusion independently. Bohm was dissatisfied with the inability of the then current models of reality to explain certain phenomena he encountered in quantum physics. For instance, the idea of quantum interconnectedness, how some subatomic particles seem to remain in constant contact sharing information instantaneously, regardless of how far away they were from each other. Such occurrences defy Einstein’s law that nothing can travel faster than the speed of light including information. Such ideas led Bohm to suggest, contrary to the popular reductionist belief, that a more holistic view of reality should be taken and that maybe the whole is the fundamental unit of existence rather than the parts.

Pribram found a similar situation in neurophysiology, specifically relating to how parts of the brain could be removed yet memories would remain intact. In addition to the physiological

findings he felt it could explain the more paranormal experiences people claimed to have in altered states of consciousness.

### **Neural Correlates of Consciousness (NCC)**

The Neural Correlates of Consciousness is actually a collection of models that base their theory of consciousness on the physical structures of the brain. Even within this model there are at least two camps represented: those that view consciousness as an emergent property of complex brain function and those that see consciousness as fundamental in the universe. They seek to map various aspects of consciousness to different subsystems of the brain. From what I've seen so far, there is another distinction in how consciousness is represented: can it be described computationally and algorithmically or not.

In Orch-OR we have a theoretical physicist, Roger Penrose, and an anesthesiologist, Stuart Hameroff proposing that consciousness arises from quantum processes within the neurons. Some say consciousness is a result of the neurons working together via synaptic connections but they argue that since some single celled organisms "...like Physarum can escape mazes and solve problems and Paramecium can swim, find food and water, learn, remember, and have sex, all without synaptic connections. How do single cells manifest intelligent behavior?" The structure of a neuron is, in part, maintained by the cytoskeleton. Inside of the cytoskeleton are microtubules. In this theory it is believed that the microtubules produce quantum processes that give rise to consciousness. While they believe consciousness to be a physical phenomenon

that can be attributed to quantum activity within the brain, specifically “...biologically ‘orchestrated’ coherent quantum processes in collections of microtubules within the brain neurons, that these quantum processes correlate with, and regulate, neuronal synaptic and membrane activity, and that the continuous Schrodinger evolution of each process terminates in accordance with the specific Diosi-Penrose (DP) scheme of ‘objective reduction’ (‘OR’) of the quantum state. This orchestrated OR activity (‘Orch OR’) is taken to result in moments of conscious awareness and/or choice.” They also “...conclude that consciousness plays an intrinsic role in the universe.” Unlike many other physicalists, however, Penrose and Hameroff don’t need consciousness to be an emergent property of complex systems. That said, they do seem to require a complex system to pull the intrinsic bits of consciousness together to form what we experience as conscious human beings. “Consciousness results from discrete physical events; such events have always existed in the universe as non-cognitive, proto-conscious events, these acting as part of precise physical laws not yet fully understood. Biology evolved a mechanism to orchestrate such events and to couple them to neuronal activity, resulting in meaningful, cognitive, conscious moments and thence also to causal control of behavior.”

Penrose uses Gödel’s incompleteness theorems to show “...how the mental quality of ‘understanding’ cannot be encapsulated by any computational system and must derive from some ‘non-computable’ effect.” Further, he and Hameroff claim that if we were able to recreate our thought processes with collections of algorithms then there would be no room for free will. In fact, Penrose’s first book on the subject, *The Emperor’s New Mind*, was an argument *against* strong AI claiming that consciousness is not computable and that there is a

physical explanation for it but we just don't yet have the science to understand it. His follow-up book, *Shadows of the Mind*, is where we get into microtubules and such.

There are several models that see us existing within a human universe and this appears to be one of them: "The DP form of OR is related to the fundamentals of quantum mechanics and space-time geometry, so Orch OR suggests that there is a connection between the brain's biomolecular processes and the basic structure of the universe." And that "[t]he Orch OR proposal suggests conscious experience is intrinsically connected to the fine-scale structure of space-time geometry, and that consciousness could be deeply related to the operation of the laws of the universe." They continue, "[i]n our own brains, the OR process that evoke[s] consciousness, would be actions that connect brain biology (quantum computation in microtubules) with the fine scale structure of space-time geometry, the most basic level of the universe, where tiny quantum space-time displacements are taken to be responsible for OR."

Now I'm no geophysicist quantum mechanic, but the way I understand this is that in this realm a system can exist in two paradoxical states simultaneously and when one is eventually replaced by the other it's known as reduction of the quantum state. For example, in Schrodinger's cat in the box thought experiment the cat in the box, at one point, is simultaneously alive and dead until the experimenter lifts the lid of the box to actually observe the state of the cat. When this happens reduction of the quantum state results in the cat being alive or dead, not both.

Penrose and Hameroff propose that each time an orchestrated reduction takes place it "...is

accompanied by a moment of proto-consciousness. These events would be thought of as the elemental constituents of 'subjective experience', or qualia..." And while, as I've already mentioned, they believe bits of consciousness to be inherent in the universe, they still require that complex systems muster those bits together to form, say, a human consciousness: "...there would normally be no significant experience associated with these ubiquitous proto-conscious events. Yet, these moments of proto-consciousness are taken to be the primitive ingredients of actual full-blown consciousness, when they are appropriately orchestrated together into a coherent whole."

In contrast to the idea of a continuous 'stream of consciousness' this theory "...proposes that consciousness consists of a sequence of discrete events, each being a moment of 'objective reduction' (OR) of a quantum state (according to the DP scheme), where it is taken that these quantum states exist as part of quantum computations carried on primarily in neuronal microtubules. Such OR events would have to be 'orchestrated' in an appropriate way (Orch OR), for genuine consciousness to arise." For us movie fans and film buffs this is really good news because this is just "... like sequential frames of a movie (modern film and video present 24 to 72 frames per second, 24 to 72 Hertz, 'Hz')". Penrose and Hameroff state that there are Buddhist writings that "...described 6,480,000 'moments' in 24 hours (an average of one 'moment' per 13.3ms, 75Hz), and some Chinese Buddhists as one 'thought' per 20ms (50Hz)." They have found that "[t]he best measurable correlate of consciousness through modern science is gamma synchrony electro-encephalography (EEG), 30 to 90Hz coherent neuronal membrane activation across various synchronized brain regions."



Moving on a bit we will look at a paper by Ned Block, professor of philosophy and psychology at NYU, where he talks about the production of a functional brain map where, by using high-resolution imaging, every neuron in the brain is mapped with the expectation of giving us a clearer picture of how the brain implements the mind. But along with the 'physical' understanding we will also need to understand the psychological concepts that are being implemented by the brain. He claims one of the greatest obstacles "...is the measurement-problem of finding consciousness in the brain." "The measurement-problem... depends on the fundamental distinction between consciousness and cognition. Consciousness is what it is like to have an experience. Cognition includes thoughts, reasoning, memory, and decisions..."

We have been mapping the anatomy of the brain since at least the 1960s and "[c]ognitive neuroscientists have identified many specialized circuits in the brain. The methodology is simple: compare the circuits that are active in, say, face perception with those that are active in other kinds of perception." So, it sounds like it would be a fairly simple matter to "...just use the same idea applied to consciousness: compare what is happening in the brain during a conscious percept with what is happening in the brain during a comparable unconscious percept[.]" But apparently it isn't.

Sometimes what they do is provide a "...subject with a series of stimuli that are at the threshold of visibility." Sometimes the subject notices them and sometimes they don't. "The stimuli

remain the same, only the consciousness changes... The problem is that... we can only tell the difference between conscious and unconscious perception on the basis of the subject's response." What ends up happening using this method, apparently, is that the neural activity of the response is basically combined with the neural activity of the perception that the subject is responding to and they become seemingly inseparable.

There is "...a type of brain injury... that causes a syndrome known as visuo-spatial extinction. If the patient sees a single object on either the left or the right, the patient can identify it, but if there are objects on both sides, the patient claims not to see one of the items..." depending on which side of the brain the injury occurred. If the injury is on the left they seem to be blind to the item on the right. One subject "...was presented with two objects, including a face on the left that he said he did not see..." however, the relevant neural circuitry for face recognition was shown to be active "...to almost the same degree as when he reports seeing the face." Could someone have a conscious experience they're not aware of? It doesn't sound likely but we know so little and it is said the universe is far stranger than we can imagine.

Professor Block remarks that "[i]f we do not solve the measurement-problem, we could record every detail of activation in the face circuit and other circuits in the brain, without determining whether those activations are conscious or unconscious." And "[m]asses of high resolution data about neural activations are no use without an understanding of what the neural activations are doing at a psychological level.

The last neural correlate model I'll talk about here is the global neuronal workspace presented by Stanislas Dehaene and Lionel Naccache. They claim that "[w]ithin a materialistic framework, each instance of mental activity is also a physical brain state." And that "[t]he cognitive neuroscience of consciousness aims at determining whether there is a systematic form of information processing and a reproducible class of neuronal activation patterns that systematically distinguish mental states that subjects label as 'conscious' from other states."

The global neuronal workspace is a framework that "...postulates that, at any given time, many modular cerebral networks are active in parallel and process information in an unconscious manner. An information becomes conscious, however, if the neural population that represents it is mobilized by top-down attentional amplification into a brain-scale state of coherent activity that involves many neurons distributed throughout the brain. The long-distance connectivity of these 'workspace neurons' can, when they are active for a minimal duration, make the information available to a variety of processes including perceptual categorization, long-term memorization, evaluation, and intentional action." But one of the major problems "...is that the object of [this] study is an introspective phenomenon, not an objectively measurable response."

The authors of the paper claim "...that this global availability of information through the workspace is what we subjectively experience as a conscious state." But they also observe "...that a considerable amount of processing can occur without consciousness." They believe

that the more neural processing that can be identified as unconscious, the smaller the field will be in which to hunt for the cognitive bases of consciousness.

Interestingly, they found there was a study using an experiment similar to the one mentioned above done on the subjects suffering from visuo-spatial extinction, where these subjects, suffering an impairment in the visual cortical areas of the brain while reporting that they couldn't see the visual stimuli their eyes were nevertheless drawn to them on a better-than-chance level. They refer to this as the 'blindsight' phenomenon.

Through experimentation they claim to see "...that some minimal duration and clarity of stimulus presentation are necessary for it to become conscious." They say "...empirical data indicate that considerable [mental] processing is possible without attention, but that attention is required for information to enter consciousness. This is compatible with Michael Posner's hypothesis of an attentional amplification... according to which the orienting of attention causes increased cerebral activation in attended areas and a transient increase in their efficiency." The authors "...have integrated this notion within the workspace model by postulating that top-down attentional amplification is the mechanism by which modular processes can be temporarily mobilized and made available to the global workspace, and therefore to consciousness." So, not only does a process in the brain have to be active but it must be amplified and remain so long enough for other processes to have a chance of accessing

it. “Without such ‘dynamic mobilization’, a process may still contribute to cognitive performance, but only unconsciously.”

There is still no “...sharp anatomical delineation of the workspace system... the contours of the workspace fluctuate as different brain circuits are temporarily mobilized, then demobilized.”

And consciousness is not yet actually mapped to specific brain areas. But they point out, however, that “[i]t is the style of activation (dynamic long-distance mobilization), rather than its cerebral localization, which characterizes consciousness.” Despite there being a coordinated effort for processes in our brain to communicate with one another along the global neural workspace, there is no ‘executive’, no one, no thing running the show in there. “Our view, however, considers this mobilization as a collective dynamic phenomenon that does not require any supervision, but rather results from the spontaneous generation of stochastic activity patterns in workspace neurons and their selection according to their adequacy to the current context...”

## **Qualia Science**

In this model it is said that every experience is made of qualia. Qualia are qualities of consciousness, anything sensed by any of the five senses. With qualia we would refer to how life is experienced rather than how it’s measured. In their book *You Are the Universe*, author and integrative medicine advocate Deepak Chopra and computational physicist Menas Kafatos list 40 qualia principles they believe could be the foundation for a science of consciousness.

They say they've "...put three cards on the table: qualia, consciousness, and the human universe. What game will be played with them? No one can predict." They call our universe the human universe because they claim there are theories being developed that describe it as "...living, conscious, and evolving" and that it is our thoughts and feelings that bring it to life.

According to their principles quantum physics has undermined the idea that the universe presents itself as it really is. Rather, the physical world isn't actually solid, tangible, or fixed. This view takes consciousness as the "...ground state of existence..." and that "...humans cannot experience, measure, or conceive of a reality devoid of consciousness." Since all experience is possible only because consciousness exists "objective" experiments are not truly objective as they would necessarily contain some degree of subjectivity. They view the universe as one continuous field of consciousness and that everything we experience in the universe is just another aspect of this field. It is their claim that "[q]ualia science explores the boundary between the perceptual and the actual, with the goal of crossing over it."

The authors have said that humanity has found there are reference points in consciousness that are recognizable and that they have led to practices such as Ayurveda and Qi Gong in the East and those like psychology and psychotherapy in the West. These all are based on subjective experience, which is what qualia is. They would like to see this taken further into realms like qualia physics and qualia biology (qualiology? qwal-yology ☺). According to them they're not looking to replace quantum physics or classical science, as they are very useful in their own

rights, but they see qualia science leading our civilization towards "...wholeness, healing and enlightenment."

## **Wrap It Up**

I remember years ago sitting in the Hayden Planetarium listening to Tom Hanks narrate the view of a city block expand into a neighborhood, a city, a state, a nation, a continent, a planet, our solar system, the Milky Way galaxy, the Local Group, the Virgo Supercluster, and then the observable universe (I'm pretty sure the Laniakea Supercluster was not a thing yet). And I was suddenly struck with the idea that it was beginning to look a lot like a nervous system. It seemed to be taking the shape of a brain. The human universe, eh? 😊 External reality as a reflection of our internal reality? The Zen mirror. Neat.

There are some common themes here, of course, first, and I think most importantly, reality and consciousness are often seen to be one and the same. It seems without consciousness, there is no reality. Without the rest of the universe, or whatever it is 'out there', there is no 'in here', we would have no context, without which we seem to have nothing. So, without reality there is no consciousness. Next, there always seem to be levels, sections, or stages that we progress through or learn about that help us deal with the various "situations of reality" we may find ourselves in.

Another theme we seem to run into is that of consciousness evolution is not necessarily a solo journey, we develop as a species, as an environment, perhaps even all life, the universe, and everything simultaneously... and nondualism just runs rampant throughout many of the models.

I write to learn, I write to create, I create to share. I truly hope you found something useful and/or interesting here. Better still, I hope you saw something here you've never seen before and pursue it in ways I could never think of.

Thanks.

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