

Fusion

Cosmic < Soul > Harmony

Brain < coherence > TA < coherence > Mind

Matter << coherence >> Spirit of Truth << coherence >> Spirit

Adjutant Mind <<< coherence >>> Mid Mind <<< coherence >>> Cosmic Mind

Intellectually <<<<< coherence >>>> Emotion Control <<<<< coherence >>>> Morontially

Involuntarily <<<<<< coherence >>>>> Brain Control <<<<<< coherence >>>>> Volitionally

Physical <<<<<<<< coherence >>>>>>> Wisdom <<<<<<<< coherence >>>>>>> Spiritual

Worship

Counsel

Knowledge

Courage

Understanding

Intuition

Protoplasm

Personalitree



**Can our physiologies influence our spiritual receptivity?
Can we influence those physiologies to increase our spiritual receptivity?**

In this paper, we will look for ways to explain, using physics and physiology, how the very different spiritual energies might interact with our material energies. We will look for possible coherences in the electrochemical physical functions of body and brain, that might shed light on spiritual to material inter-associations. We will also look at our mindal/emotional overcontrol of these physiologies and perhaps find ways to improve our ability to detect, enhance and improve receptivity and capacity for spiritual influences.

I am not suggesting a reductionist mechanism wherein our self-consciousness and therefore our God consciousness could be reduced to the motions of matter. We are more than our matter and as it says in The Urantia Book, in paper 12 section 6 paragraph 3 on the top of page 136.

Mind alone can interassociate the physical forces and energies of the material level with the spiritual powers and beings of the spirit level. 12:6.3 (136.1)

In the inner experience of man, mind is joined to matter. 1:3.7 (26.1)

Mind, in functioning beings, is not separated from energy or spirit, or both. Mind is not inherent in energy; energy is receptive and responsive to mind.... 9:4.2 (102.2)

Mind is the technique whereby spirit realities become experiential to creature personalities. 2:8:8 (140.4)

The mind is a personal-energy system existing around a divine spirit nucleus and functioning in a material environment. 12:9:6 (142.1)

Therefore are the spiritual and the material, the inner and the outer, human experiences always correlated with the mind function and conditioned, as to their conscious realization, by the mind activity. Man experiences matter in his mind; he experiences spiritual reality in the soul but becomes conscious of this experience in his mind. 103:6.6 (1136.1)

What is mind? What is spirit? Is spirit real? Is it a real force, a real power, and a real stimulus to produce spirit substance? We may not be able to find spirit substances in our material bodies, but we may find some of the effects of spiritual luminosity on the solar radiometer of our mind as it influences our brain and nervous systems.



**Spirit substance (quality) is just as responsive to spirit gravity as the organized energy of physical matter (quantity) is responsive to physical gravity. Spiritual values and spirit forces are real.
7:1:3 (82.2)**

How can we be materially influenced by spirit forces? How does a progressing mind yield a progressing spirit?
How might we become perfect even as the “I am” is perfect?

In time, man’s body is just as real as mind or spirit, but in death, both mind (identity) and spirit survive while the body does not. ... And so your Greek figure of speech—the material as the shadow of the more real spirit substance —does have a philosophic significance. 12:8:16 (141.1)

We will explore some of our physical functions that might show evidence of spiritual influence.

30,000-foot Paradise (Urantia Book) Perspective

We are under the influence of material gravity from below, and mindal and spiritual gravity from above. Material gravity will ensure that our dust remains under the control of Urantia gravity but our mind as it guides our choices, decisions, and steadfastness, may help us to transfer the seat of our material identity to our more enduring quality, our soul.

At the top is a perfect God. At the bottom there is pattern less energy with potentiality.

At the top there are:

Spirit Perfections –Absolute Deity, ideal spirit.

Mind Perfections – Ideal mind.

Matter Perfections – The source of energy and perfect material patterns.

At the bottom there are:

Unqualified Absolutes, pattern less energy with potentiality.

There is a tension between these two extremes and the Universal Absolute accommodates the tensions between these extremes. Over time, energy automatically improves its patterns and stability through involuntary energy tension relieving (with a corresponding increase in entropy, second law of thermodynamics), improving the organization of matter. This includes the information encoded in that matter, (second law of information dynamics SLID, Ref 101) up to the stage of sentience (the so called thermo-contextual interpretation). After establishing sentience, the responsibility for improvement (using energy to advance information) may be in part passed over to the sentient beings. Notice how slow and incremental the progress of evolution was, to achieve this sentience! At our sentient stage, we can recognize the tensions from above and using our 3 cosmic intuitions (causation, duty, and worship), we can logically, incrementally, continue that stabilization, organization, and cooperation towards perfection.

There are three theories of causation:

Upward: Scientific Causation - energy-matter makes us what we are.

In this theory, everything that exists in the physical universe is dependent on the same fundamental entities and interactions (found by splitting matter apart down to the smallest currently possible scales). Living creatures can be divided into cells; cells themselves are

composed of organelles; organelles can be broken down into molecules; molecules are made up of atoms; atoms are comprised of electrons (clouds of ultimatons) and atomic nuclei (quarks and gluons). These fundamental particles obey certain fundamentally inherent laws in their associations.

Downward: Spiritual Causation - God makes us what we are.

In this theory, the fundamental laws of science are God's preferred way of doing things and we have little or no contribution to the process.

Comparing these two theories from my personal perspective, if the universe was created based on a downward causation scenario, we might see large collections of matter fragmenting into smaller structures. If it were purely an upward creation, mutual gravitation would gradually bring matter together. Instead, our universe appears to be an amalgam of both. The universe is not described well by either scenario. In my humble opinion, a more plausible combined scenario is:

Up/Down: Scientific/Spiritual Causation - Energy becomes matter and evolves into sentient beings. Sentient beings continue the process.

We are going to examine some of the ways that we are resolving these top – down and bottom – up tensions for perfection, from both external physiological, and internal psychological perspectives, using our God given body (to feelingly experience) our brain (to discover, recognize and choose), and our mind (to build patterns of thinking to facilitate future improvement).

The areas we are going to investigate are:

Part 1

1. Consciousness
2. Personal Consciousness and the Whole
3. Brain, Mind and Consciousness
4. Current Theories of Consciousness

Part 2

1. Physiologies of Body Consciousness
2. Intercellular Communication
3. Epigenetics
4. Neurotransmitters
5. Homeostasis
6. Brain Waves
7. Mental Picturizations
8. Activity Regulated Cytoskeletons & Synaptic Adhesion Molecules

Part 3

1. The Maturing Brain
2. Thought Adjuster Reception
3. Changer, Adjuster, Controller
4. Microtubules
5. Microtubule Quantum Coherences

Part 4

1. Electromagnetic Continuum

2. Morontial Material – Hard Light
3. Physiological Continuum
4. Single and Multiple Quantum Coherences
5. Time
6. Time Consciousness
7. Multiple Physiological Clocks
8. Thought Feedback Loops
9. Near Death Experiences

Part 5

1. Emotional Processes
2. Emotional Self-Mastery
3. Thought Processes
4. Sentience and God Consciousness
5. Top-Down and Bottom-Up Perspectives
6. Soul Physiology

Part 6

1. Experiential Soul Fusion
2. Philosophy of the Physiology of Spiritual Influences

We are going to look for ways to harmonize with, and to be more aware of, morontial or spiritual influences, and we will look for ways to discover, connect, and improve our thinking and behaving in these following methodologies:

1. Magnetic coherences
 - a. Nuclear resonances
2. Electrical coherences
 - a. Electromechanical resonances
3. Combined Mechanical and Optical coherences
 - a. Microtubule/neurotubule coherences
4. Intellectual coherences
 - a. Philosophy of the physiology of spiritual Influences
 - b. Philosophical coherences

While examining these, you may want to look for personal coherences that involve:

- a. Our actions
 - i. Serving
 - ii. Praying
 - iii. Worshiping
- b. Our Soul
 - i. Formation
 - ii. Growth
 - iii. Awareness
 - iv. Fusion

We may want to try to emulate our master in these mental gymnastics.

Jesus possessed the ability effectively to mobilize all his powers of mind, soul, and body on the task immediately in hand. He could concentrate his deep-thinking mind on the one problem which he wished to solve, and this, in connection with his untiring patience, enabled him serenely to endure the trials of a difficult mortal existence—to live as if he were “seeing Him who is invisible. 127:3.15 (1400.7)

In this exploration, I have done the research (see references below), but the suppositions and extrapolations are mine. The statements are always open for debate, and there are no right or wrong answers to any questions that may arise and there are many areas that call for further research. None of this is unequivocally provable. That's where faith comes in but hopefully the existence of plausible mechanisms will help strengthen that faith.

Consciousness

We intuitively know we are conscious, but what is consciousness? We can't discuss consciousness until we define it. We can't discuss self-consciousness, with the eventual extension to God consciousness, without having an idea of what consciousness is. Consciousness seems to involve the process of raising entropy as it seeks the lowest energy state and a concurrent improvement in pattern.

We have external and internal consciousnesses. We have body consciousness, perspectival consciousness, volitional consciousness, narrative consciousness, and social consciousness. Our individual and collective consciousness seems to change as we mature and as we pattern the electrical signals received from our senses (sight, hearing, touch, taste, smell, proprioception, nociception sense of pain, vestibular balance and spatial orientation) and fit them into our current mental models. Self-consciousness may be our creative interpretation of sensory input and the conversion to thought output. Perspicacity (insight) then allows us to extrapolate self-consciousness, into God consciousness.

An electron is conscious of the electric field that surrounds it. Molecules (which include electrons) function in that same electromagnetic continuum and are conscious of other molecules that surround them. There is a hierarchy of consciousnesses in the brain and body that further cascades and become our total consciousness. We can be materially conscious (aware of our senses), socially conscious (aware of our interactions with others) or even God conscious depending on our ability to sense our surroundings.

Where does the electricity, for these electrical signals that we are creatively patterning and modelling, come from in the first place? Our gut goes from acid to alkaline. This is analogous to charging a battery. Electricity is then used to make ATP (cellular mini batteries) in the electron transfer chain processes in each cell's mitochondria. (Ref 29) The electric potential, stored in ATP, facilitates motion and inter/intra cellular communication. All communications involve this biochemical electricity directly or result in either hydrophilic (binding) or hydrophobic (repelling) interactions. Some fundamental intercellular communications are pain, effort reduction, tension relief and their corollary; pleasure seeking. As we manage the tensions between these voltage potential differences, the reptilian brain stem functions as our sensory input/output hub. It passes electrical signals on to multiple areas of the brain for storage or reaction and they send back an “intelligent” electrical response as we continuously reflect, cross reference, and choose. I call this continuous sensing, reflection and choosing, consciousness.

The evolutionary type of knowledge is but the accumulation of protoplasmic memory material; this is the most primitive form of creature consciousness. Wisdom embraces the ideas formulated

from protoplasmic memory in process of association and recombination, and such phenomena differentiate human mind from mere animal mind. 101:6.4 (1111.8)

Are there other types of consciousness? Consciousness is thought to be a multifaceted and complex phenomenon, and has been categorized in various ways by psychologists, neuroscientists, and philosophers. Here are some of the different types or aspects of consciousness:

Wakefulness or Arousal: This is the most basic sense of consciousness, referring to the state of being awake and responsive to the environment, as opposed to being asleep or in a coma.

Phenomenal Consciousness: This involves the subjective experience or qualia — the ‘what it is like’ aspect of consciousness. It encompasses the sensations, perceptions, dreams, and feelings that are part of our experiences.

Visual Consciousness: Visual awareness, functioning between phenomenal consciousness and access consciousness. (Ref 25)

Access Consciousness: Defined by philosopher Ned Block, (Ref 73) refers to the brain processes that make information available for verbal reporting, reasoning, and the control of behavior. It’s more about the functionality and utility of consciousness.

Self-Consciousness: A higher level of consciousness where one becomes aware of oneself as an individual, separate from others and the environment. It includes self-recognition and self-awareness.

Meta-Consciousness: Thinking about one’s own consciousness including reflecting on one’s own thoughts, feelings, and sensations.

Narrative Consciousness: The human capacity to link events and experiences into a chronological and meaningful story involving personal identity and memory, constructing a narrative of ‘self’ over time.

Altered States of Consciousness: A state that differs significantly from normal waking consciousness and can be induced in various ways, such as through meditation, hypnosis, drug use, worship, or dreams.

Collective Consciousness: A concept primarily used in sociology and anthropology, referring to the set of shared beliefs, ideas, attitudes, common to a social group or society.

Non-Conscious Processes: The mental processes that occur outside of conscious awareness, such as implicit memory, automatic skills, and subliminal perceptions.

Super-consciousness: A material aid to a subconscious reservoir of mortal experience, which we use for inspiration and guidance at the borders of contact with the spiritual. **91:3.5 (997.3)**

Cosmic Consciousness: A philosophical doctrine, referring to a higher, all-encompassing form of consciousness that connects the individual to the universe.

Each of these definitions consider different aspects of consciousness, from physiological arousal to complex reflective philosophical or cosmic perspectives. Understanding the various definitions highlights how multidimensional consciousness is.

Personal Consciousness and the Whole

From a basic understanding of our individual consciousness, we try to become conscious of, and sense other consciousnesses. We try to sense our influence on others, and we try to sense their influence on us. We have a general sense of Ubuntu (I am because we are). From a spiritual perspective, we often try to sense our relationship to consciousnesses not seen. The Urantia Book says that this relationship mechanism is *vital*.

Relationships exist between two objects, but three or more objects eventuate a system, and such a system is much more than just an enlarged or complex relationship. This distinction is vital, for in a cosmic system the individual members are not connected with each other except in relation to the whole and through the individuality of the whole. 112:1.17 (1227.7)

Now let's make the first step towards sensing our place in the "whole" and our sense of God consciousness.

The far-flung physical universe coheres in the Isle of Paradise; the intellectual universe coheres in the God of mind, the Conjoint Actor; the spiritual universe is coherent in the personality of the Eternal Son. ... Man's Adjuster is a fragment of God and everlastingly seeks for divine unification; it coheres with, and in, the Paradise Deity of the First Source and Center. 2:7:7 (42.8)

Can we connect our electrical signals to the whole universe? Can we connect science and spirit? Can we harmonize brain functions, thoughts, sights, and insights? Can spirit give us the ability to recognize valuable influences? Is insight the shadow of spirit luminosity? Can we be conscious of God? Let's examine some of the laws of physics that might be involved in the interactions between us and the whole, between the eternal and the temporal, the infinite, and the finite, the spiritual and the mindal, the morontial and the material, spirit, and brain.

Always should the domains of the physical (electrochemical) and the mental response to environmental stimuli be differentiated, and in turn must they all be recognized as phenomena apart from spiritual activities. 65:7:8 (739.4)

Brain, Mind and Consciousness

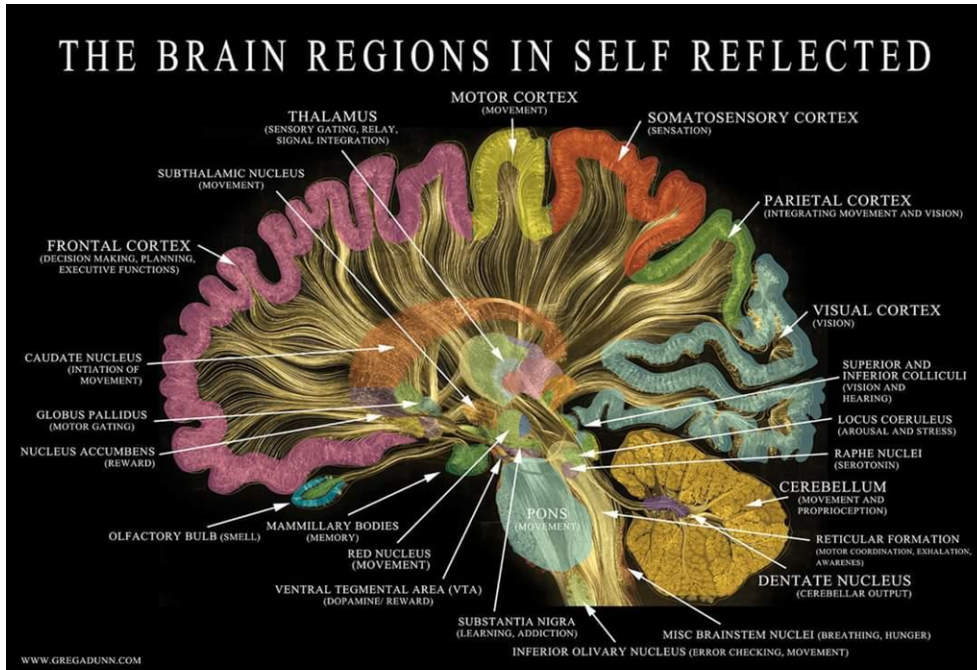
Mind transmutes the values of spirit into the meanings of intellect; volition has power to bring the meanings of mind to fruit in both the material and spiritual domains. 9:4.6 (102.6)

The mind is a personal-energy system existing around a divine spirit nucleus and functioning in a material environment. 12:9.6 (142.1)

The brain acts as an objective sensor, actuator and controller and gives us our subjective perceptions. Consciousness is the base from which we operate, and we operate on a hierarchy of scales.

The material makeup of the brain spans many spatial scales of organization. From genes and molecules to cells, from protein complexes to 'molecular machines' such as ion channels. A neuron is composed of computationally and functionally distinct and independent parts: its dendrites, the initial segment, the axon, and synaptic arborizations and there are many scales of organization above a neuron. Neurons connect with each other to form local neural circuits, which combine to form structures such as cortical columns. Eventually distinct anatomical and functional brain regions connect in increasing scales to the whole brain in networks of cells to networks of brain regions. (Ref 102) According to Ran Levi of Aberdeen University, the brain processes information in a "in a highly ordered way" in an eleven-dimensional configuration, with holes. This indicates that the network's neurons respond to inputs. They found that the brain builds and then destroys a tower out of various three-dimensional building pieces. It is called the algebraic topographical hierarchy. It starts with rods (1D), then moves to planks (2D), then to cubes (3D), and then moves to more sophisticated geometries with 4D, 5D up to 11 dimensions. Activities move through the brain by building multi-dimensional sandcastles in a hierarchy of mechanical functions that cascade up to consciousness, and then, disassembles them (unless they

are made more permanent). Similarly, there may be a hierarchy of philosophical actions that cause cascades in our higher levels of thinking that lead up to levels of spiritual awareness.



Our mind differs from our brain. The brain is the material, tangible part of our body, whereas the mind is a consciousness or mindfulness of the brain’s activities, and therefore, intangible. The brain harbors all the details. The mind solves the “binding problem”; the association of the parts into “gramma’s face” or the Statue of Liberty. The brain and body together interactively prioritize the availability of the details, and they both have a pre-prioritized status.

Both the neurological and the intellectual hierarchies first occur in our brain and then in our mind. Let’s first look at the brain. Our brain has two hemispheres. In very general terms, the right hemisphere acts like a parallel processor while the left acts like a serial processor and they are connected by the 300 million axonal projections of the corpus collosum. The right side is all about processing our present connections to sensor inputs. The left more linearly, methodically predicts our future based on our current predicament. Left brain is our “brain chatter”, our self-definition, our “I am” and our “I will be”. I like to think of the right side as Newtonian (macro, looking at the past) and the left side as Einsteinian (relativistic, extrapolating a probabilistic future). The corpus collosum (and microtubules which we will discuss in more detail later) facilitate the interactions between our stored past and our potential/predictable future.

Now let’s look at the mind. Our mind is more the “consciousness” or “mindfulness” of the brain’s activities. Our conscious identity is not just the electrochemical status of our brain or body, nor is it just our mind. Our personal consciousness may be more the realizations of the mind, using input from the body and brain, as it relates, harmonizes, and coheres in a super additive analysis of their collective cooperation. Our consciousness is constantly aware of our current state, comparing that state with our past, and anticipating its consequences for our future.

Mind. The thinking, perceiving, and feeling mechanism of the human organism. The total conscious and unconscious experience. The intelligence associated with the emotional life reaching upward through worship and wisdom to the spirit level. 0:5.8 (8.8)

“The human mind is one of the great mysteries of modern science, as we cannot sufficiently explain how the brain in general, or consciousness in particular, works. However, it’s a reasonable “null hypothesis” to presume that electricity, i.e., the flow of electrons, is the primary driver behind our perceptions that we are conscious. Although quantum effects may play a role, it’s an unnecessary complication to presume that consciousness is anything other than the flow of electricity.” **Ethan Siegel** (Ref 64)

Let’s look at some of the “unnecessary complications” of living electrochemical activities of our animal brain and body. Some of the more widely accepted biological processes include the mitochondrial electron transport chain, electron and proton tunneling in proteins, and magnetoreception. Let’s see if we can find some of those intangibles that determine how we prioritize things with the goal of becoming more spiritually minded.

The physical brain with its associated nervous system possesses innate capacity for response to mind ministry just as the developing mind of a personality possesses a certain innate capacity for spirit receptivity and therefore contains the potentials of spiritual progress and attainment. Intellectual, social, moral, and spiritual evolution are dependent on the mind ministry of the seven adjutant spirits and their superphysical associates. 65:6.10 (738.3)

The different states of the “**thinking, perceiving, and feeling mechanism of the human organism**” 0:5:8 (8.8) has many different levels of activity:

- unconsciousness – a disrupted connectivity state of the brain’s input mechanisms.
- “cessation” – unconsciousness attained by advanced meditation. (Ref 95 & 96)
- sub consciousness – a state of suppressed input activity.
- deep sleep – a delta wave dominant, immune system strengthening, body repairing state.
- hypnagogia – a creative transition from wakefulness to sleep.
- light quiet sleep – a period of hypothalamus shut down when the endocrine/hormone system link is suspended.
- rapid eye movement (REM) – active dream sleep, when the noradrenaline, fight-or-flight response and thermostat regulation systems are suspended.
- wakefulness – a beta wave dominant state of free will controlled thinking.
- superconsciousness - the pre-prioritized state of the brain that is not overtly involved in input analysis or decision making.

Side note: Microglia, a type of neuroglia or glial macrophage cleanup cell, and the brain waste removal processes are most active during deep sleep.

Looking at our multiple states of consciousness prompts some questions. What influences these various states of our brain’s activity? What extracts, filters, or makes us more aware of our current thoughts than our stored memories or observations? How does our awareness shift from material to spiritual, from “me” to “we”, from self to selfless, from adjutant to cosmic thinking? Where does our consciousness of God come from? Let’s use our creative wakefulness (and perhaps our hypnagogia and our superconsciousness) to look for some logical connections between intelligence and consciousness, between cellular interactions and spiritual growth.

Current Theories of Consciousness

These are the top 8 theories (Ref 35, 106) of consciousness:

Integrated Information Theory: IIT - Consciousness as a Web of Information (Ref 74)

The more interconnected or integrated the system the higher the “Phi” consciousness.

Higher-Order Theories: HOT - Consciousness as Self-Reflection (Ref 75)

The brain represents its own higher order of perception or mental state. Conscious experience is the result of thoughts about thoughts, self-representation or metacognition. (Ref 50)

Biological Naturalism: Consciousness as a Biological Naturalism Phenomenon (Ref 76)

An emergent biological phenomenon of purely physical biological mechanisms in the brain where specific neural correlates of consciousness (NCCs) form a minimal set of brain mechanisms when producing a particular conscious experience.

Panpsychism: The Universal Consciousness (Ref 41)

Consciousness as a fundamental property of the universe, akin to mass or charge. All physical entities, from electrons to galaxies, possess some form of consciousness or proto consciousness.

Neural Darwinism: Theory of Neuronal Group Selection. The Evolution of Consciousness

Consciousness emerging through a process of selection among groups of neurons, akin to the principles of natural selection.

Global Workspace Theory: GWT - Consciousness as a Central Information Hub (Ref 77)

Consciousness arises from the integration and sharing of information across different brain regions and functioning as a central information hub, allowing various cognitive processes to communicate and cooperate.

Thermodynamic Theory: Consciousness arising as a complex, self-organizing patterning of energy, information processing, energy efficiency, and entropy reduction in the evolution of complex systems capable of exhibiting intelligent behaviors and subjective experiences. (Ref 82)

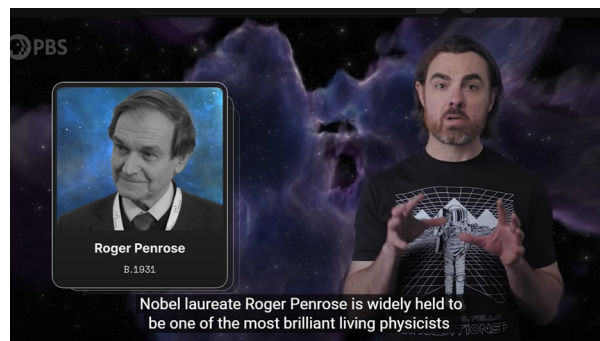
Quantum Consciousness Theory: Quantum Mind Theory (Ref 78)

Quantum Consciousness Theory is based on the idea that microtubules, which are tiny protein structures found within cells with DNA, can facilitate quantum computations.

We are going to focus on the Quantum Consciousness Mind Theory because I think it most closely reflects Urantia book concepts. I also like thinking of us as existing at the intersection of the past and the future where our past created our status, by normal Newtonian mechanisms, and our potential future as probabilistically determined by our thoughts. (Ref 83)

Here’s a good YouTube video of current thinking that relates to this presentation:

<https://youtube.com/watch?v=xa2Kpkksf3k&feature=shared>



Physiologies of Body Consciousness

Our digestive system is involved in all the above-mentioned consciousness states. Our gut (sometimes called the second brain) has capabilities that may surpass our brain’s intercommunication ability. It has its own nervous

system, known as the enteric nervous system, and the cells in our body communicate with each other and have a direct pipeline to the brain via the Vagus (pneumogastric – lung heart) nerve. Our gut’s food processing mechanism moves serially from acidic to alkaline, charging the battery, and it is electrically aided by being grounded through our connection to mother earth. We eat proteins of one form (plant or animal), break them down into their constituent parts (amino acids, di and tri peptides) and then reassemble them into the configurations we need. The human body makes from 80,000 to 400,000 different types of proteins for many different purposes. The processes of using the electro-motive power to extract and rebuild the necessary building blocks for the cells of our body co-evolved with us. We were designed and have evolved to be electrically active, but we also have some control in the ways we discharge the battery, and we will try to see how we can wisely direct that electrical discharge process.

Our cells communicate with each other mechanically, interacting with neighboring cells or by transferring electrically patterned peptide signaling molecules with hydrophilic (water attracting) and hydrophobic (water repelling) patterning. Interaction between cells is determined by the electrical surface properties (positive – negative being attractive and like charges being repelling). All cells possess a common genetic constitution, but they are influenced by their cellular environment, and their position in their nearby electrodynamic field. The thing that determines whether their DNA folds into a brain cell protein or into a gall bladder, is its electrical environment. The cell’s formation is controlled by an extra-biological guiding principle, called “entelechy” which literally means “the realization of potential”. (Ref 48 & 94 Mike Levin Ted Talk)

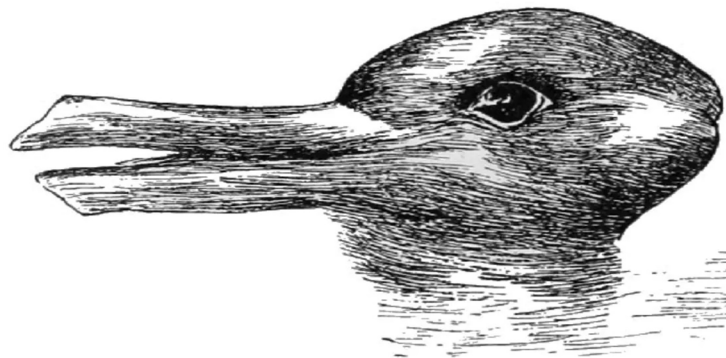
Peptides form the basis of non-immune system signaling molecules and there are up to seventy different types of peptides. Peptides are small portions of digested or manufactured proteins, and form signaling molecules like endorphins (Ref 13), hormones, and neurotransmitters. These signaling messenger molecules connect the cells of the body’s endocrine (bodily functions), and nervous systems, cascading electro-chemical messages between cells, along nerves, up the spinal cord, to the brain stem, the amygdala, the hypothalamus, the thalamus, the pineal and pituitary glands, and then on to other areas of the brain for appropriate responses. These peptides form the base of the periaqueductal gray (PAG) area of the brain stem which is the hub for self-awareness and pain mitigation. This is also the hub for our qualia, the internal and subjective sense of our perceptions, the introspectively accessible aspect of our brain. The physical processes in the brain that give rise to “what is it like” or subjective experiences, is called the “qualia”. Qualia is our self-organizing, self-referring and self-actualizing psychosomatic network that gives us our intrinsic properties of experiences (think sub and superconsciousness). Peptides manage the biochemical overcontrol of our 34,000 possible emotions (Ref 80) and play a crucial role in assisting our qualia and the activities of our immune system, by integrating mental, emotional, biological activities and eventually our spiritual wellbeing. They change or predict our behaviors, affect our moods, and color our unique emotional tone (Ref 20) and interestingly, there are no hard-wired emotion control circuits in the brain. Emotional responses, as measured by our heart rate variability HRV, are controllable.

At any moment of time, in the blood stream of any human being there exists the possibility of upward of 15,000,000 chemical reactions between the hormone output of a dozen ductless glands. 65:6.6 (737.6)

Peptide-based compounds cause chemical reactions and as these reactions cascade along nerves, their “critical first stop” is the brain stem and medial limbic region of the brain (including the pineal gland) where they are sorted and prioritized before furtherance to the neocortex for responses or for memory storage. Sensory inputs are dealt with via the amygdala and the sympathetic (fight or flight accelerator) nervous system and balanced by

the parasympathetic (think Vagus heart-lung) nervous system which regulates “rest and digest” “calm down” functions.

There are 86×10^{10} neurons transmitting signals at about 120 m/s or 275 mph. There are 100×10^{14} synapses of which 250,000 are firing at any one moment. If we think of the synapses as the pixels of a camera and the firing rate as the number of pixels that are changing from frame to frame, then the refresh rate of the image occurs at $((100 \times 10^{14}) / 250,000) / 275 = 1,454,545$ frames per hour or 24,242 per second. To handle the continuum of signals, the brain has constant communication between its 86 billion neurons and its 100 trillion synapses. This is 10 to the millionth power of possible states, so the flow of information is more like constantly moving three dimensional images. As a tiny example of this, the brain can form a three-dimensional image from the electrochemical signals received as light from an object hits dozens of parallel stacked “pigment” disks in the rods (for detecting dim light) and cones (red, green and blue/ultraviolet) of the retina (Ref 86). Each disk has a seething liquidity of receptor molecules moving in a “random” manner. If more than 6 light molecules are triggered within a half second it sets off a cascade with a nearby molecules in this semi liquid sea, transferring a small signaling molecule amplifying the signal and it takes billions upon billions of photons to create an image. Similarly, other cells in the body have “random” motion collisions with neighboring cells or they transfer messenger molecules which determine their interactions. In the case of the eye, these interactions cascade electrochemical signals in a chain reaction down the optic nerve to the visual cortex of the brain which creates the visual image, but our conscious image is made up of much more than just the visual image. Our conscious image includes everything that is happening, along with all our previous models, memories, related thoughts, qualia, gut actions, reactions, current and future intents. It is interesting to note that there are ten times as many neural connections coming back from the various cortex areas of the brain, as there are going out from it, so the mid brain is sharing the current inputs with all other associated areas of the brain for continuous reflecting, cross referencing, model building and choosing. In effect, we are continuously observing and relating our current self with our past self. (Ref 10) That we can perceive this ambiguous image in one of two ways is like the quantum superposition of states where it is only “fixed” once observed. (Ref 103)



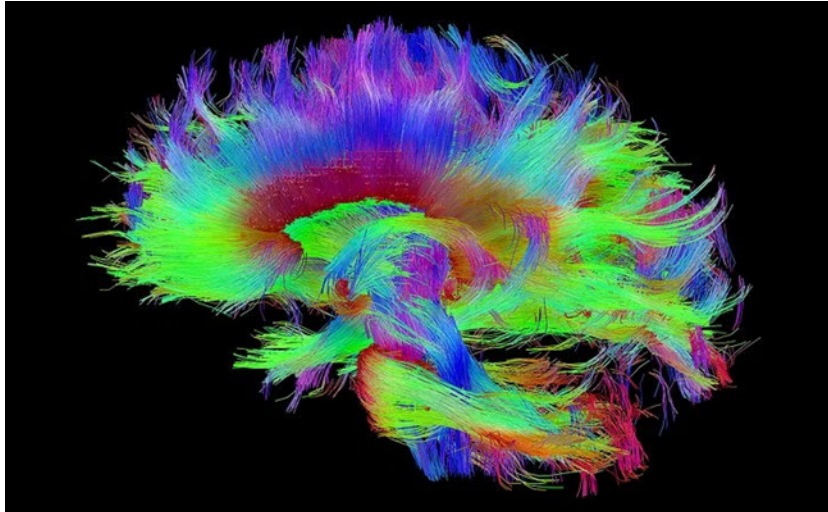
Is it a Duck looking left or a Rabbit looking right?

“The human mind does not create real values; human experience does not yield universe insight. Concerning insight, the recognition of moral values and the discernment of spiritual meanings, all that the human mind can do is to discover, recognize, interpret, and choose.” 196:3.10 (2094.9)

Ideas are not simply a record of sensations; ideas are sensations plus the reflective interpretations of the personal self; and the self is more than the sum of one’s sensations. 133:7:7 (1534.6)

Side note: The most important part of the brain, the neo-cortex, is almost the same everywhere. It manifests material uniformity.

Side note: Up to 30% of the brain is used primarily for adapting, deciding, reasoning, and planning.



Brain Wiring Networks

Intercellular Communication

Intercellular communication is not limited to the brain. Communication between individual cells is facilitated by cellular cytoskeletal structures (the hardware of cells), eicosanoids (in the immune system) and nerve cells (neurons). Cytoskeletal structures are in all cells, including neurons. They include microtubules, and they are used to transport information and move substances to various parts of the cell. They also work closely with neighboring cells, rapidly changing their molecular structures, and intermediate filaments. (Ref 84)

It is important to distinguish between neurons and nerves. A neuron is an individual cell that processes and transmits information through electrochemical signals whereas a nerve is a bundle of axons (the long, slender projections of neurons) in the nervous system. So, while neurons are individual cells that carry nerve impulses, nerves are bundles of these neurons.

Let's first look at nerves of which there are two types, sensory (incoming) and motor (outgoing). Nerves are made up of many sections varying in length from 0.1 mm to a meter and there are millions of miles of them in our brain. Nerve stimulation has a trigger voltage below which there is no response and above that voltage the nerve fires. Peptide neurotransmitters are chemical messengers that are released to communicate (fire), unidirectionally, between nerve segments.

The actual electrical energy that "fires" a neuron, also known as an action potential, is created by the movement of ions across the neuron's cell membrane. Here's a step-by-step breakdown of the process:

Resting State: When a neuron is not sending signals, it is in a resting state. During this state, the inside of the neuron has a negative charge relative to the outside due to the distribution of different ions across the cell membrane.

Depolarization: When a neuron receives a signal strong enough to pass a certain threshold, it triggers an action potential. This process, known as depolarization, involves the opening of sodium channels in the neuron's membrane, allowing positively charged sodium ions to rush into the neuron.

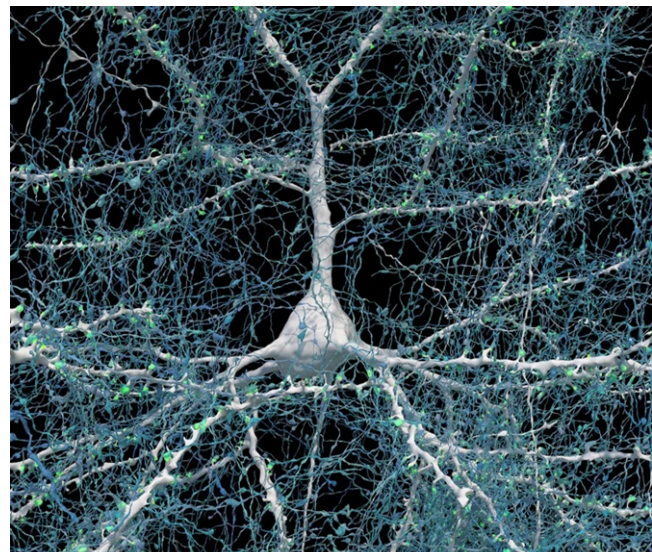
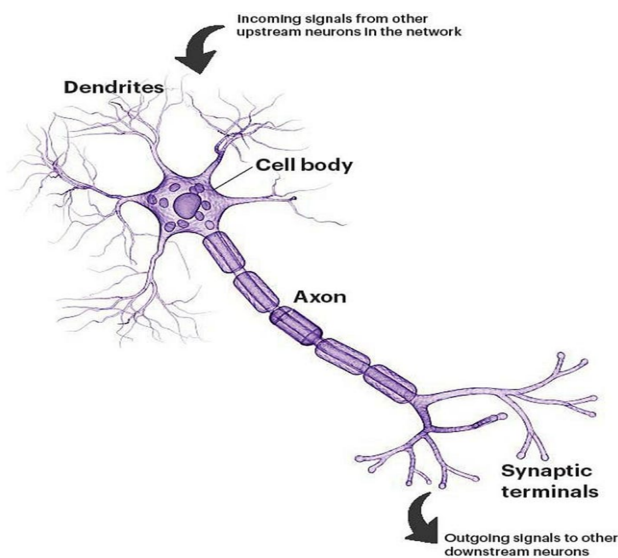
Propagation of the Action Potential: The influx of sodium ions changes the electrical charge inside the cell, causing the action potential to propagate along the length of the neuron's axon.

Repolarization: After the action potential has passed, potassium channels in the neuron's membrane open, allowing positively charged potassium ions to flow out of the neuron. This helps restore the negative charge inside the neuron.

Refractory Period: After an action potential, there is a brief refractory period during which the neuron cannot fire again. During this time, the sodium-potassium pump works to restore the original distribution of ions across the neuron's membrane.

It's important to note that while this process involves the movement of ions, it is fundamentally different from how traditional electricity is generated. Traditional electricity is generated by the movement of free electrons, but the electricity generated by neurons results from the motion of sodium and potassium ions across the cell membrane.

The voltage and frequency of firing encodes the information as it is transmitted via the peptides and action potential along the nerve. Each segment intercommunicates at their intersections and these intersections do not actually touch, instead, they have a 40-nanometer gap between them called the synapse. At each synapse, are the synaptic vesicles which contain these peptide neurotransmitters.



Single Neuron

Neurotransmitters (which control the concentrations of sodium and potassium ions) are prepositioned at each synapse as a function of our emotional predisposition and transfer their influence as they are released. Their concentrations can be changed by two main processes: epigenetic methylation (the replacement of a methyl group in place of a hydrogen atom on the appropriate DNA gene segment) and our emotional self-mastery. An

example of epigenetic modification would be when a gene is modified to make the enzyme catechol-O-methyltransferase (COMT) which breaks down the neurotransmitters, dopamine, epinephrine, and norepinephrine.

The chemicals that are released from a synapse when triggered, are a function of the genetic and epigenetically modified synapse chamber shape and their current electrical status. Their electrical predisposition (which is influenced by previous activity) is determined by the local concentrations of calcium, potassium, and sodium ions (Ref 47) in and around, the neurotransmitter chamber itself. For example, abrineurin (BDNF or Brain-Derived Neurotrophic Factor) is a signaling protein that can enhance neuroplasticity, and its levels can be boosted by exercise (Ref 15), ketosis, magnesium (L-Threonate) intake and good sleep. (Ref 57) One emotional condition, fear, involves the presence of calcitonin, a gene-related peptide, which is created by all fears and this peptide relays signals to other areas of the mid brain. Fear, with its related animal facial expressions and mannerisms, is mediated by dopamine from the amygdala. (Ref 9)

So much of fear persists in the present-day races of Urantia because your ancestors received so little of Adam's life plasm, ...76:4.6 (851.4)

Side note: Current research shows that fears can only be mitigated by building new stronger neural chemical pathways rather than trying to ignore the old ones.

Epigenetics

Let's look more closely at epi (above) genetics. Epigenetic changes occur at the molecular, DNA level, making them difficult to observe directly, however, their effects can sometimes be observed in the form of changes in physical traits or health conditions.

Here are some examples:

Pregnancy Diet: The foods a biological mother eats while pregnant can cause epigenetic changes in the developing fetus. These changes can potentially affect the child's health and physical traits.

Early Life Trauma: Experiences of trauma at a young age can lead to epigenetic changes that may manifest later in life such as mental health issues or other health conditions.

Cancer: Epigenetic changes can play a role in the development of some cancers. For instance, an epigenetic change that silences a tumor suppressor gene could lead to uncontrolled cellular growth.

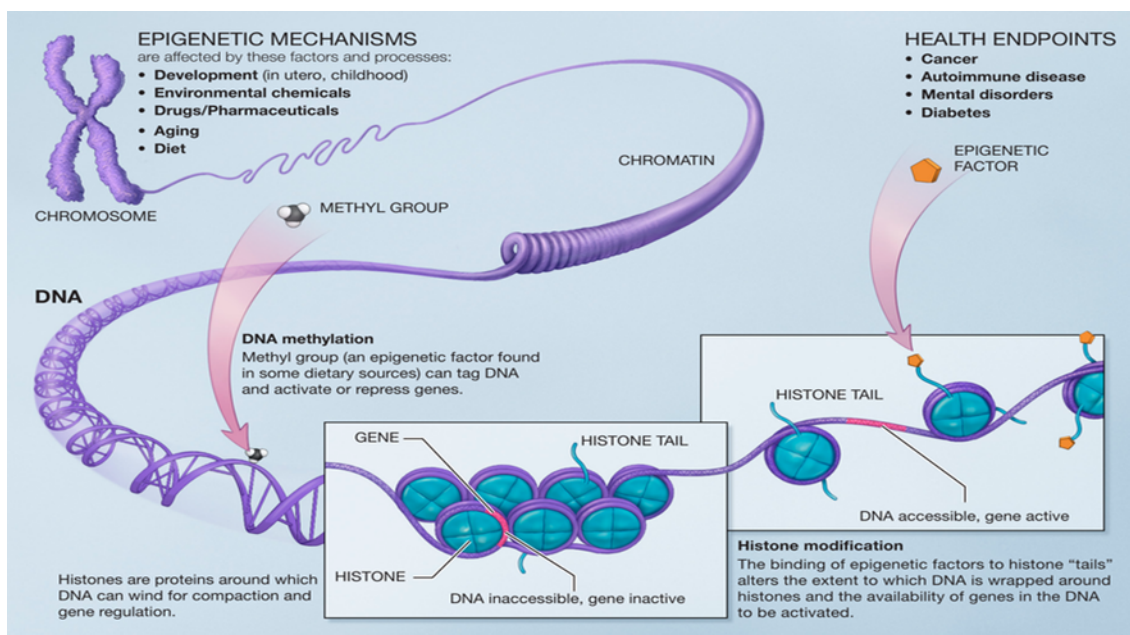
Cell Differentiation: Epigenetic changes are also responsible for cell differentiation, where cells with the same DNA become different types of cells (like skin cells, liver cells, brain cells, etc.) based on which genes are turned "on" or "off".

Note that while these changes can be influenced by environmental factors and lifestyle choices, they do not involve changes to the underlying DNA sequence. Instead, they involve modifications to how the DNA is "read" by the body.

There are two kinds of DNA; nuclear DNA located in the nucleus of all our eukaryote cells, and it usually has

two copies per cell, and maternal DNA, located in the cell's mitochondria, which contains 100 to 1,000 copies per cell. These DNAs are made up of two 1.8-meter-long strands of small nitrogen-containing nucleoside compounds; adenine (A), cytosine (C), guanine (G), and thymine (T). We can choose to be reactive or proactive in gene expression using epigenetic reprogramming and our emotional control.

DNA is present in most of the cells in our body and the thing that determines whether it acts like a brain cell or gall bladder is the way it is folded. DNA is made up of segments called gene segments and the combinations of these patterns are called its “gene expression” or “allele”. The complete gene expression is called your epigenome. There are parts of the DNA that are called “supergenes”, and these segments are not open for modification but there are three things that can control DNA’s collective gene expression; its electrical environment, small DNA segments called “enhancers” and methylation “tagging.” These change the final folded shape, and the final folded shape determines the protein’s function, i.e. whether it is a brain cell or a gall bladder.

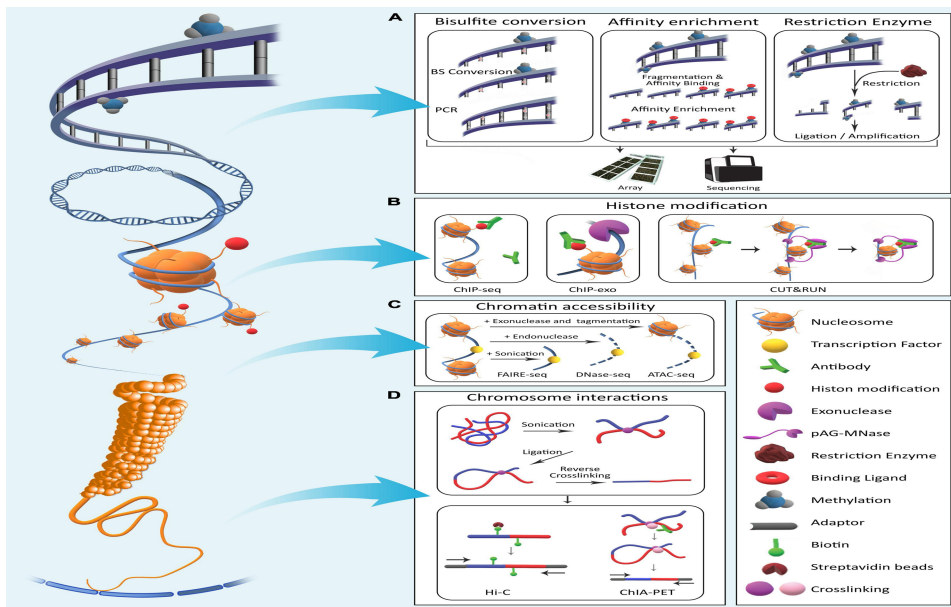


Epigenetic DNA Tagging

It is estimated that neurons in the human brain have over 4000 unique enhancers and 10- to 50-fold more glial cells which are not shared by other primates. (Ref 81) Human neurons are more densely packed and consume more energy per neuron than other animals (6 Kcal per billion neurons). Gene expression (the DNA folding pattern) determines which proteins are produced and that shape can be changed by the addition of methyl groups at strategic locations along the DNA strands but there are three other major methods of “epi” (above) genetic tagging or modification: histone acetylation (adding an acetyl group to histone proteins), chromatin compaction (wrapping the DNA around another protein) and nuclear organization (spatially arranging the chromosomes).

There are long-term gene expressions (think brain or gall bladder) and short-term ones, like when some comment angers you. An emotional response causes changes in the gene expression of certain cells, which does things like increase your heart rate, blood pressure, adjust your breathing, tense your muscles, or stand the hair up on the back of your neck.

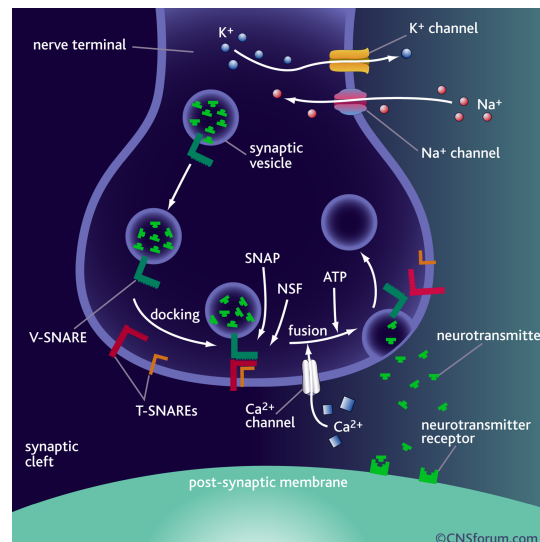
Side note: Recent research, direct current-actuated regulation technology or DART (Ref 36), uses direct-current voltages to change gene expression.



Epigenetic change techniques

Neurotransmitters

The chemicals that are prepositioned at each of our nerve synapses are called neurotransmitters and they determine our predetermined thought and emotional tendencies.



Synapse

The electrical environment of synapses and the associated neurotransmitters, plus their epigenetics, determine their manufacture and release. Some of their main influences are as follows:

Serotonin (95% of which comes from the gut): anxiety, current happiness, sense of wellbeing, appetite, mood, memory, and sleep.

Dopamine: unexpected benefit, motivation, pleasure, future happiness

Note: Alcohol or sugar levels increase dopamine levels by activating the nucleus accumbens (pleasure/reward center) and this sets the “current expectation level” above which dopamine is then released. This is called “The Pleasure Trap” or addiction. (Ref 53)

Glutamate and Gamma-Aminobutyric Acid (GABA): balance, excitement versus the urge to be calm.

Note: The blend of these determines our level of maturity and is the most active of the neurotransmitters.

Norepinephrine (aka - noradrenaline): alertness, arousal, attention, cognitive function, and stress reactions

Acetylcholine: focus, learning and memory, parasympathetic (against emotion) nervous system

Oxytocin (a hormone and a neuropeptide with more pronounced, prolonged effect): orgasm, social recognition, pair bonding, anxiety, group bias

Endorphin (neuropeptide): current pleasure, self-esteem

Neurotensin (neuropeptide): like dopamine, but specifically for the differentiation of “good” from “bad” thoughts (stems from a survival perspective but may be involved with moral choices as well)

Melatonin (hormone): circadian rhythm (primarily from the pineal gland)

Cells in the synapse areas fall into two categories, neurotransmitters (function) and glial (protectors) except for glutamate astrocytes that function as both. Extracellular glutamate stimulates Ca²⁺ release from the astrocytes’ intracellular stores, which triggers glutamate release from astrocytes to the adjacent neurons.

Life Carriers **36:2:15 (398.2)** get huge credit here for the original design that led to intricate channels in our cell walls that creatively change shape with electrical potentials to open and close allowing the flow of these motivating chemicals in this dynamic environment. The flow through the cell walls of the chambers and their surrounding conditions are affected by previous stresses, anxieties, and fears of the future (among other things).

By consistent, free will choice, we can slowly, incrementally, change our neurotransmitter predispositions.

Homeostasis

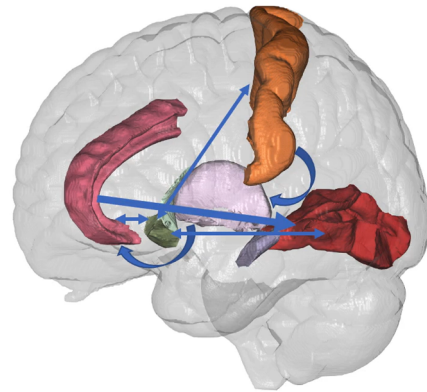
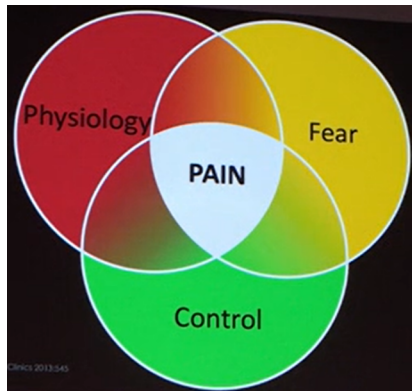
A major component in maintaining homeostasis and equanimity, is the hypothalamic-pituitary-adrenal (HPA) axis (Ref 43), which is an intricate, robust, neuroendocrine (nerve triggered hormone release) mechanism, that has similar physical attributes to neurons. It mediates the effects of stressors by regulating metabolic, immune responses, and the autonomic nervous system (ANS). The HPA (Ref 16) cascades signals down endocrine pathways that respond to negative feedback loops involving the hypothalamus, anterior pituitary gland, and adrenal glands.

Anxiety was a natural state of the savage mind. When men and women fall victims to excessive anxiety, they are simply reverting to the natural estate of their far-distant ancestors; and when anxiety becomes actually painful, it inhibits activity and unfailingly institutes evolutionary changes and biologic adaptations. Pain and suffering are essential to progressive evolution. 86:2.1 (951.3)

Anxiety puts us in a constant fight or flight response state resulting in long term reductions of noradrenaline, so we become less attentive and less engaged. The antidote is a reset strategy that brings your amygdala and locus coeruleus back to homeostasis by a balance of calm, meditative behavior or group worship and focused physical and mental exercise. (Ref 93)

All physical poisons greatly retard the efforts of the Adjuster to exalt the material mind, while the mental poisons of fear, anger, envy, jealousy, suspicion, and intolerance likewise tremendously interfere with the spiritual progress of the evolving soul. 110:1:5 (1204.3)

Pain and the use of drugs (poisons with one beneficial side effect) to mitigate pain is a classic case of misinterpretation. Dramatic neural activity is interpreted by the brain as a need to pay attention. We can mitigate pain by distraction. Opioids don't block pain; they over stimulate the pleasure centers of the brain to distract the senses. We can distract the brain's focus on pain physiologically, with vibration, cold or other mental activities.



Distraction Antitheses

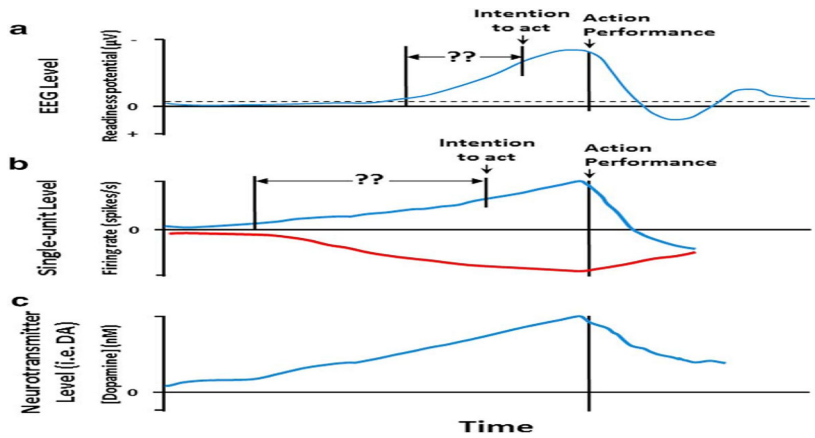
Our initial emotional conditions relate to our calmness, which in turn relates to our trust in stable, unchangeable things, like God. Above this calm or frenetic initial electrical energy state, there is an on/off, nerve firing, transmission mechanism. The intensity and duration of the firing voltage, and frequency of firing repetition, determines which neurotransmitters are released from the synapses. High voltage, high frequency, longer duration stimulations, are involved in the more intense reactions and can be calmed by low, meditative, prayer like or worshipful frequencies.

Jesus taught the appeal to the emotions as the technique of arresting and focusing the intellectual attention. 152:6:4 (1705.4)

Brain Waves

Benjamin Libet conducted experiments (Ref 71) that demonstrated that we unconsciously think about an action, up to 300 milliseconds before we are conscious of that thought. This implies that our superconsciousness or mid mind is the precursor of our conscious thoughts. Imagine this preemptive action happening at all our brain wave frequencies from the lowest at 4 Hz up to our highest functioning range of over 100 Hz.

All this precursive, thought triggering, neuro-peptide electro chemical activity eventually shows up as brain waves and these individual excitations cascade in waves of various overlapping scales of neural avalanches (thoughts).



One pulse of a neuron firing.

The experience of the realization of the reality of unconscious religious growth is the one positive proof of the functional existence of the superconsciousness. 100:1.9 (1095.4)

The lowest, delta wave frequencies, those experienced in deep meditation (Ref 21, 38) and worship, generally have the highest amplitudes, and interestingly, are the dominant frequencies in a young child's brain. At those early ages our mystery monitors functioned as Thought Changers.

From the arrival of the Adjuster to comparative full growth, about twenty years of age on Urantia, the Monitors are sometimes designated Thought Changers. 107:0.7 (1184.2)

The higher frequencies and more entrenched ways of thinking (as the neurons become myelinated – coated to speed up transmissions) become dominant by age 25, except in perhaps periods of meditation, true worship, and deep sleep.

Electro-chemical signals between each nerve segment are triggered at 5 to 50 times per second and a propagation signal ripples along the nerve as a wave of action potential. These ripples of action along the nerve are a pulse above the base voltage, and they shuttle the electrical pulses at between 200Hz and 300Hz. On a related note (pun intended) the frequency of this wave of action potential varies for individual events and equates to musical notes between G 196Hz and D 294Hz. This may be why music is often relaxing and it is interesting to note that live music is more effective in producing positive amygdala (think emotional) neurofeedback. (Ref 23, 54)

Tuneful syncopation represents a transition from the musical monotony of primitive man to the expressionful harmony and meaningful melodies of your later-day musicians. 44:1:13 (498.4)

Electrical activity of the brain is usually divided into three categories:

1. Spontaneous activity
2. Evoked potential activity
3. Single neuron events

Spontaneous activity is measured on the scalp or on the brain and is called the electroencephalogram. This signal goes from under 1 Hz to about 100 Hz and this activity goes on continuously in the living individual.

Evoked potentials are those components of the EEG that arise in response to a stimulus (electric, auditory, visual, or spiritual) and these signals are usually below the noise level and therefore not readily distinguished. One must use signal averaging to “see” these over the background noise.

Single-neuron events can only be examined using microelectrodes which impale the cells of interest. These include neurotubule events.

Our spontaneous brain activities (Ref 6,7) are quite frenetic, as can be seen in a typical electroencephalogram, EEG, snapshot of the electric fields emanating from the brain’s activities. The electrically associated and massively cross-correlated bio electrically initiated signals of all the brain’s synaptic interactions can be grouped and parsed into ranges reflecting their general functions as follows:

Gamma (40 to 100 Hz not shown) – involved in recent **intellectual activity**.

Beta (12 to 40 Hz) – involved in **executive functioning**.

Alpha (8 to 12 Hz) - involved in **relaxed cognitive functioning**.

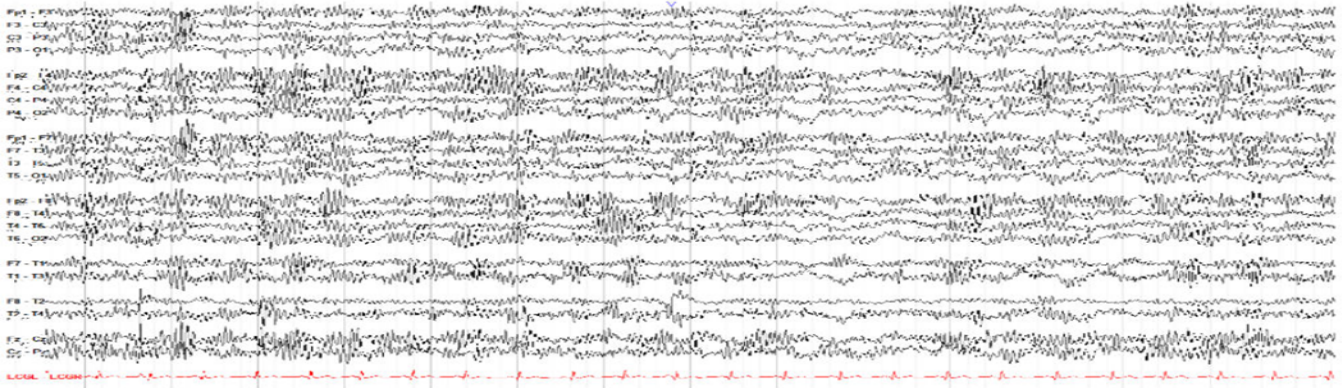
Theta (4 to 8 Hz) - involved in light **meditation** and sleep.

Delta (0 to 4 Hz) - involved in **deep meditation**.

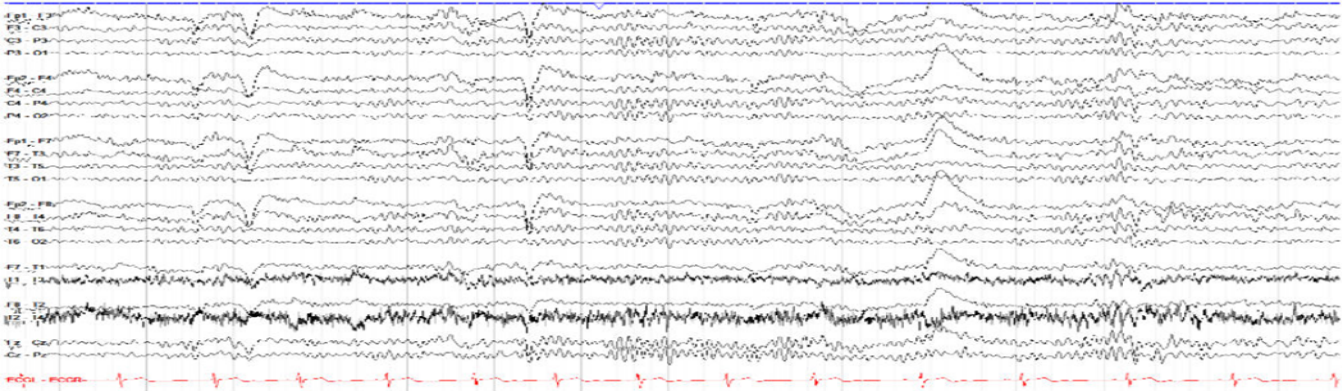
Voltage variations have a drift velocity of charge carriers (generalized patterning) that flow at about 1 – 2 mm per sec (0.006 ft/sec). Voltages in the electroencephalogram images shown here represent +/- 30 micro-Volts above the much higher action potential ripple voltage base (initial conditions) of -70 milli-volts. It may be that when we lower the base voltage, when we are calm, we make the “signal pattern” (+/- 30 micro volts) more “visible”.

Nearly all our cells can generate electricity, but electrons don’t flow like a wire, instead, a chemical ion with a certain charge jumps from one cell to the next and between one myelin insulated axon segment to the next until it reaches its destination. The myelin sheath is typically about 100 microns long, with 1-to-2-micron gaps between them. The speed of signals without the myelin is subsonic but myelinated signals seem to be entangled with photons released by the tricarboxylic acid cycle that releases a cascade of infrared photons that couple to the vibrations of the carbon hydrogen bonds in the lipid molecules of the myelin exciting them to a higher energy state releasing more photons. (Ref 98) The speed at which these electrical signals travel can vary greatly, depending on the type of neuron and whether the neuron is myelinated, but speeds range from 1 to 100 meters per second.

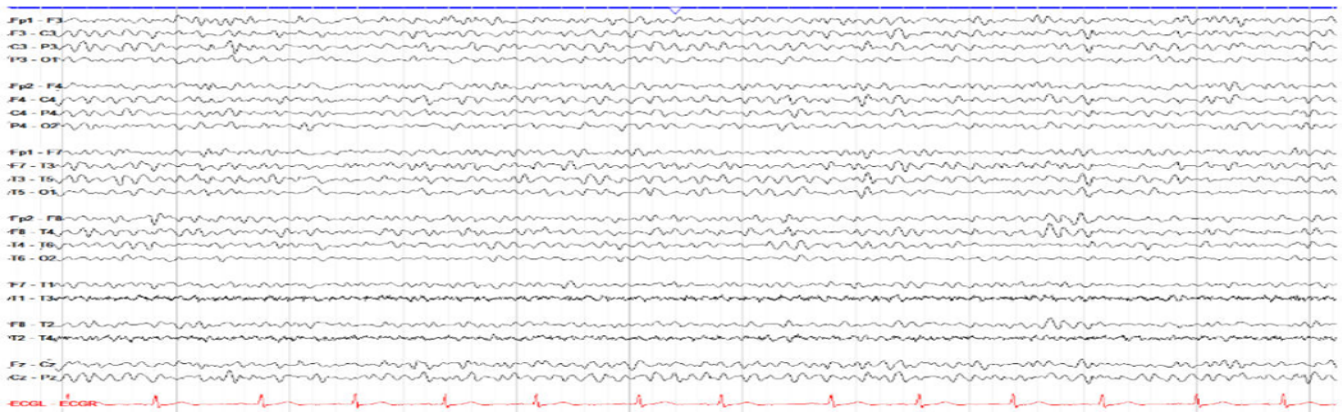
Electroencephalogram



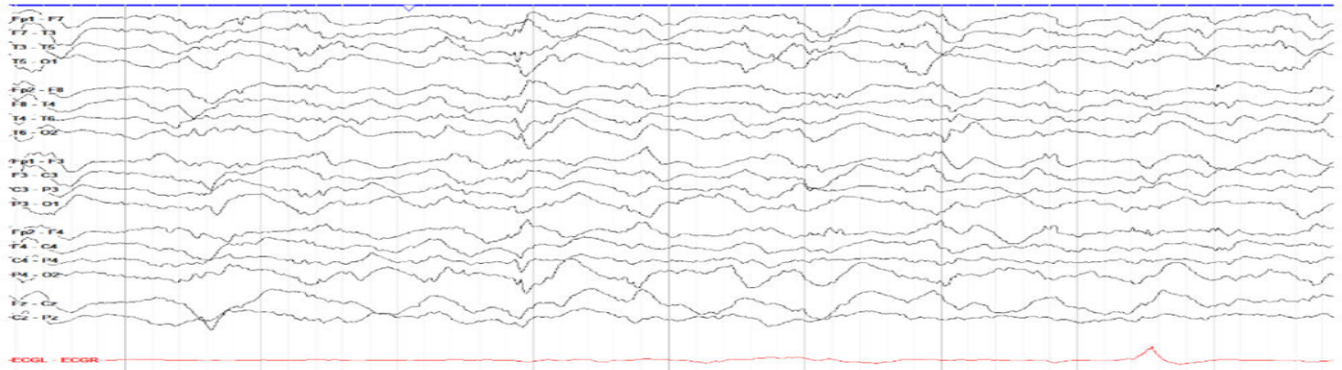
Delta Theta Alpha **Beta** Beta (12 to 40 Hz)



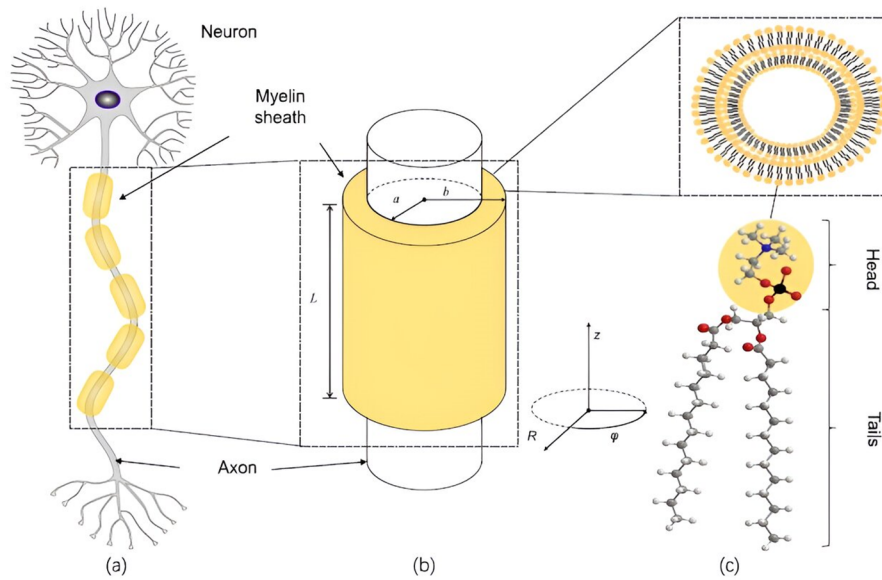
Delta Theta **Alpha** Alpha (8 to 12 Hz) Beta



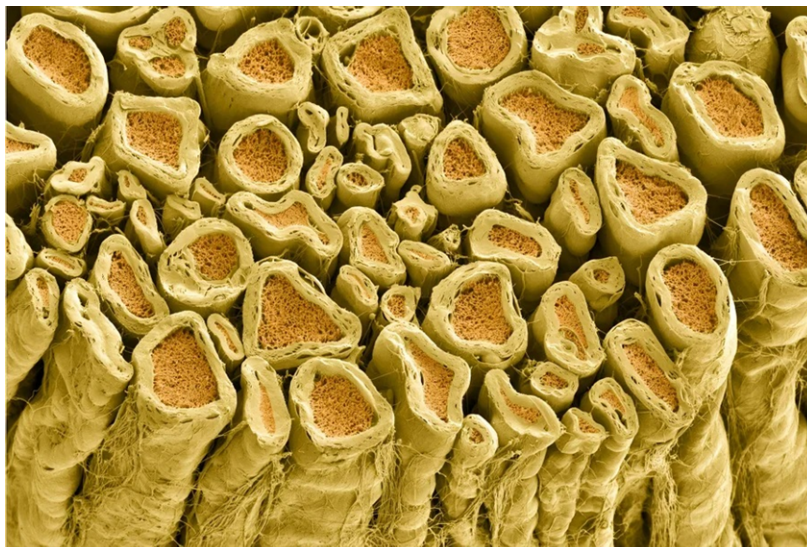
Delta **Theta** Theta (4 to 8 Hz) Alpha Beta



Delta Delta (0 to 4 Hz) Theta Alpha Beta



Myelin Sheaths over Nerve Axons



Rat Brain Nerves with Myelin Coatings

The myelin sheath, as a cylindrical cavity, facilitates the generation of entangled photon pairs. (Ref 108) Researchers in August of this year discovered that the specific vibration of C-H bonds in lipid molecules within the myelin sheath can produce entangled photons. Given the abundance of these bonds in neurons, this mechanism could be a significant source of quantum entanglement within the nervous system. This discovery hints at a possible explanation for how the brain utilizes quantum entanglement for information transfer, potentially explaining the synchronized neuronal activity crucial for consciousness.

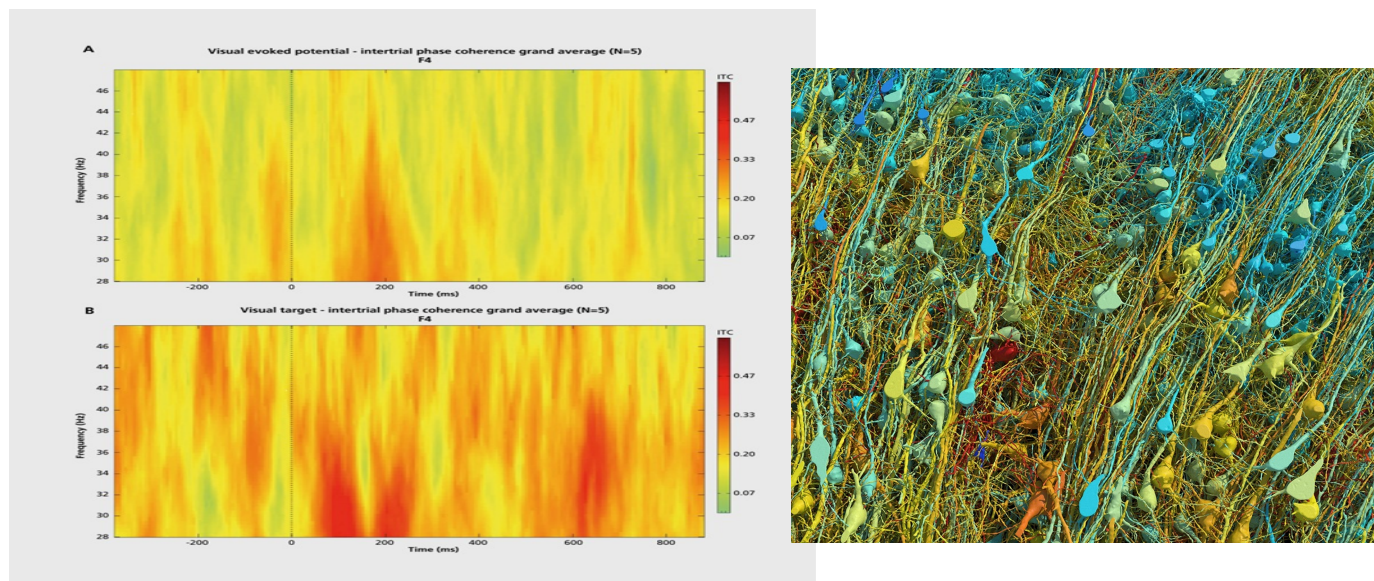
It is interesting to note that science finds no trace of myelin in the ancestral line that preceded the arrival of vertebrates, animals with backbones. (Ref 99 and 58:4.2 (667.6)) “Apparently”, a virus infected a vertebrate

ancestor, slipping the genetic instructions for making myelin into its DNA. The evolutionary phenomenon represents an example of the term “suddenly” used 96 times by *The Urantia Book* and what scientists refer to as “punctuated equilibrium”, reflecting a speedy specialization pattern of significant evolutionary change. (Ref 62.) Curiously, myelin is wrapped around nerve fibers by entirely different cells in the body (Schwann cells) than in the brain (oligodendrocytes) and astonishingly, 40 percent of the DNA in mammals consists of remnants of these retroviral infections.

In the Thought Changer phase (before the solidification of the myelin sheaths) Delta waves and massive cross communication between nerves dominate. The delta wave frequencies (0 to 8 Hz) can be replicated in a deep meditative state, or worship. Perhaps engaging in complete parental trust in God would allow slower thinking and more cross communication between brain cells, or perhaps by enjoying a particularly soothing piece of music, we would be able to **“resemble the unsuspecting trust of the child mind” 196:0:11 (2089.1) and as 167:6:1 (1839.6) says; “Verily, verily, I say to you, whosoever receives not the kingdom of God as a little child shall hardly enter therein to grow up to the full stature of spiritual manhood.”**

Mental Picturizations

A published study in *Science Advances* in April 2022 shows that the brain passes information like waves throughout the brain. Picture a three-dimensional volumetric cascade of electro chemical excitations. The waves of particle interactions within this volume cascade into more wavelets of activity that move and create more ripples in the mind pool. Wave peaks and troughs interfere or augment and influence other neurons. Our thoughts are cross correlated in any one memory (smells, relationships, expectations etc.).



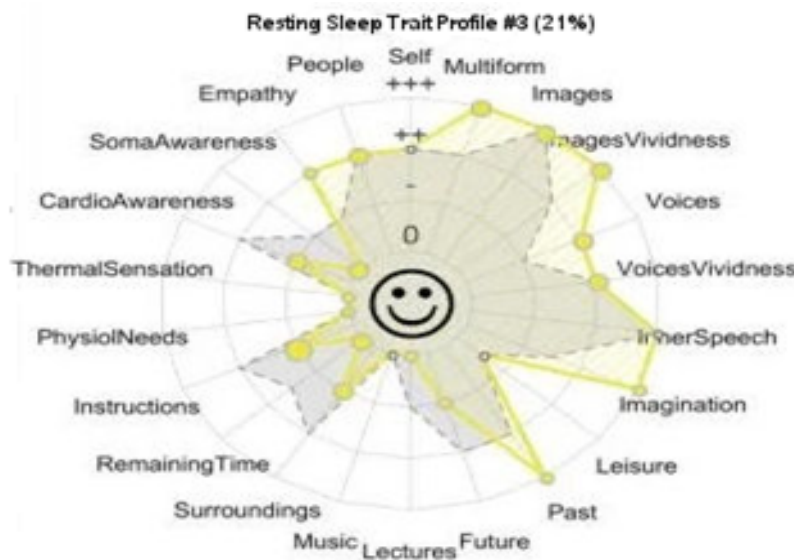
Two-dimensional image slice of three-dimensional brain activity

It may not be so much the dominance of a single frequency, as it is the harmonies of all the frequencies that give us the total picture. When we look at the complexity and unorganized nature of the EEG traces, you can see the way the electrical activity clusters spatially and how challenging the task of the Thought Adjuster is. The larger red areas in the above two-dimensional slice, represent stronger thought drivers.

When we get to the thought controller stage of cooperation, by actively trying to align wills, we become more receptive to changing the overall patterning. Couple this, with quantum level, so called “random” involvement, and it might be seen how the adjutants **30:2:21 (335.12)** or Thought Adjuster might be able to influence these general superconscious or mid-mind patterns. As these patterns are influenced by, and tend to align with, cosmic patterns, and the precursors to our reflective thinking, these will adjust our material reality via emotional and epigenetic management, as our neural activities try to harmonize, amplify, and align these 3-dimensional volumetric images.

At such times, and sometimes during sleep, the Adjuster is able to arrest the mental currents, to stay the flow, and then to divert the idea procession; and all this is done in order to effect deep spiritual transformations in the higher recesses of the superconsciousness. 109:5:1 (1199.2)

Recent research (Ref 52) done on the brain at rest by Cremona, Joliot and Mellet (2023) derived “thought profiles” from a cluster analysis of data from nearly 1,800 French university students. In addition to “tried-and-true” measures, this group completed a novel survey of resting-state personality dynamics, the ReSQ 2.0 and found core pathological character traits or brain picturization groupings. (Ref 52)



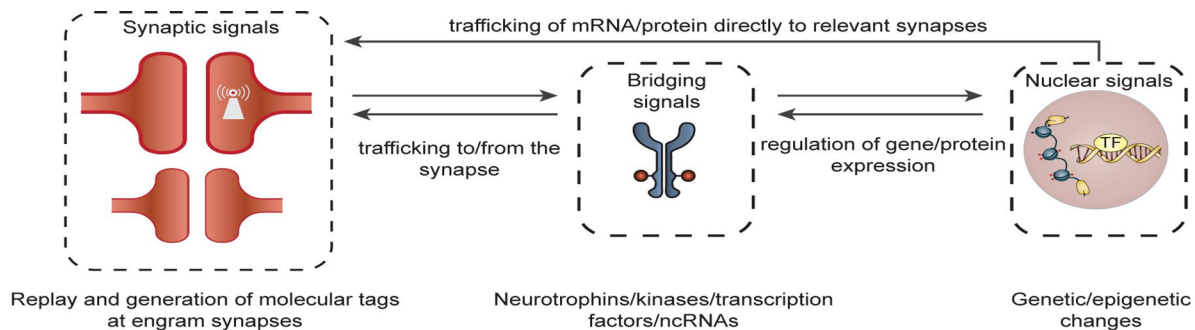
Scientist Pulin Gong at the University of Sydney also found spiral patterns that exhibited intricate and complex dynamics, moving across the brain’s surface while rotating around central points, known as phase singularities. (Ref 34)

The Thought Adjuster, throughout our life, is trying to “realty-ize” our thoughts (create electrical images that harmonize with the cosmos) as a function of the mind that “knows quantity, reality, meanings” when we “**feel the mutual creation**”. **111:3.6 (1219.5)**

If we think of the Thought Adjuster as a holographic fragment of God, each fragment of God, as it steps out of infinity and into finity, could be thought of as a low-resolution image of God and the whole of creation. To improve the resolution of the image we have of God, we can cumulatively add our own low-res image perspectives with other people’s images and understandings, to get higher and higher resolutions and visualizations of the overall image. With each perspective we get a better understanding of material creation and the forces behind it.

Activity Regulated Cytoskeletal Peptides & Synaptic Adhesion Molecules ARCs and SAMs

At the base of life itself is RNA. Ribonucleic acid (RNA) is a polymeric molecule that is essential for most biological functions, either by performing the function itself (non-coding RNA) or by forming a template to produce proteins (messenger RNA) where the information from one cell is packaged and communicated to nearby cells. RNA, ribonucleic, DNA, deoxyribonucleic, are both nucleic acids and nucleic acids are one of the four major macromolecules essential for all known forms of life. (Ref 27, 115)



mRNA Process

Communication between brain cells is essential and is aided by activity regulated cytoskeleton (ARC) peptides which are proteins in our brains that spread information through a messenger RNA (mRNA) like process. These Arc's encapsulate the mRNA within its shell, protecting it from degradation. Neurons release these extracellular vesicles (EVs). This phenomenon mirrors how viruses carry genes inside their protective capsids and may have been introduced by the life carriers in the Devonian age as the first function of neuron like memory activity. (Ref 88) Within a cell, mRNA carries the genetic instructions from the DNA in the nucleus to the ribosome, the site of protein synthesis. The ribosome then translates these genetic instructions into proteins.

There are also SAMs that are like a peptide glue that cement our nano-scale neural networks. The mRNA molecules carry genetic information and make special proteins that change the firing voltage at synaptic junctions and influence the combinations of inputs from other nerves.

For memories, neurons that fire together wire together, and neurons that fire out of sync, fail to link.

“Cementing our memories is a complex process and is still an intense field of investigation. (Ref 117) Out of all the possible energy states, the system will converge (be SAM glued) to a local electrical minimum, also called a local attractor state. Local attractor minima states are existing memories and influence our ways of thinking.

ARCs influence local electrical minimum by causing a protein to fold in a specific manner, called a capsid which moves from neuron to neuron creating preferred pathways. This process of RNA sharing exchanges information between synapses for specific functions such as memory correlation and then SAMs strengthen and confirm these relationships. (Ref 107)

These established relationships primarily impact the synapse receptors found in the brain, and they are the foundation of human cognition and intelligence (Ref 44).

Some of these foundational areas of the brain are as follows:

Frontal lobe: Voluntary movement, attention, short term memory tasks, *motivation*, planning, and speech.

Parietal lobe: Proprioceptive and mechanoceptive, involved in language processing.

Temporal lobe: *Decoding sensory input* (visual and auditory) into *derived meanings for retention* of visual memory and language comprehension.

Occipital lobe: Taste, visceral, pain and vestibular functions.

Limbic lobe: *Emotions*, modulation of visceral and autonomic functions, *learning and memory*.

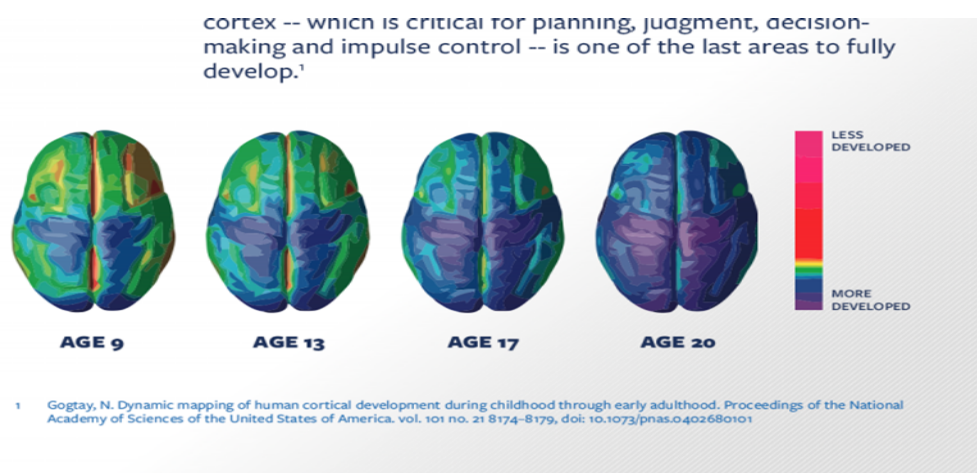
The Thought Adjuster is likely most interested in those functions shown in *bold italics* since these are ones that help us grow our souls in “**certain trying intellectual and testing social situations**” 101:3.4 (1108.3)

It is interesting to note that the dominant frequencies for the lobes of likely Thought Adjuster influence range from 10Hz to 23Hz. The frontal lobe (motivation) is 22 to 23Hz and the temporal lobes (derived meanings) are: superior 10Hz, middle 23Hz, inferior 10Hz.

The Maturing Brain

Maturing areas of the brain include the frontal and parietal lobes, the insula, and the subcortical structures. But a more interesting feature of the maturing brain involves the “white matter” that gradually envelops the nerve cells in all these areas. This “white matter” coats and insulates the active transmission portions of the nerves by the formation of the myelin sheaths we talked about earlier.

These onion skin like protein insulative coatings thicken with age and allow much faster information propagation but limit their cross communication as the pathways become more defined and we become more fixed in our ways of thinking. We are defining the preferred voltage pathways, and the corresponding voltages required to “get out of the rut”. Before these insulating sheaths formed (up to about age 25) our thoughts are slower, much more cross connected, more influenced by emotions, socialized thoughts, and highly influenced by peer pressure.



Adolescent Brain

In our early “formative” and presumably more trusting, stress-free years, the child’s brain is more open to learning (e.g., walking, talking, socially interacting). What we are forming are our basic 4 million neural

connections called your “connectome”, and this forming or patterning continues up to about age 25 after which this neuroplasticity slows down. It is interesting to note that the balance of glutamate to GABA, (excitement versus the urge to be calm) changes throughout childhood and into adolescence, as glutamate levels increase then level off as adulthood approaches.

Thought Adjuster Reception

Related to the early child brain plasticity, is the reception of the Thought Adjuster at our first moral decision, which begs the question: What peptides in the brain are involved in moral choices? What parts of the brain are involved in moral sensitivity, emotion, motivation, cooperation, ethics, respect, and the differentiation of good and evil or other altruistic behaviors? What is different about the child brain that allows the Thought Changer to “change”, versus “adjust” or “control” our thoughts? Moritz Köster’s research published in Science Direct in 2021 shows that young children’s “4–5 Hz theta rhythm” (Ref 51) increases when they meet unexpected events.

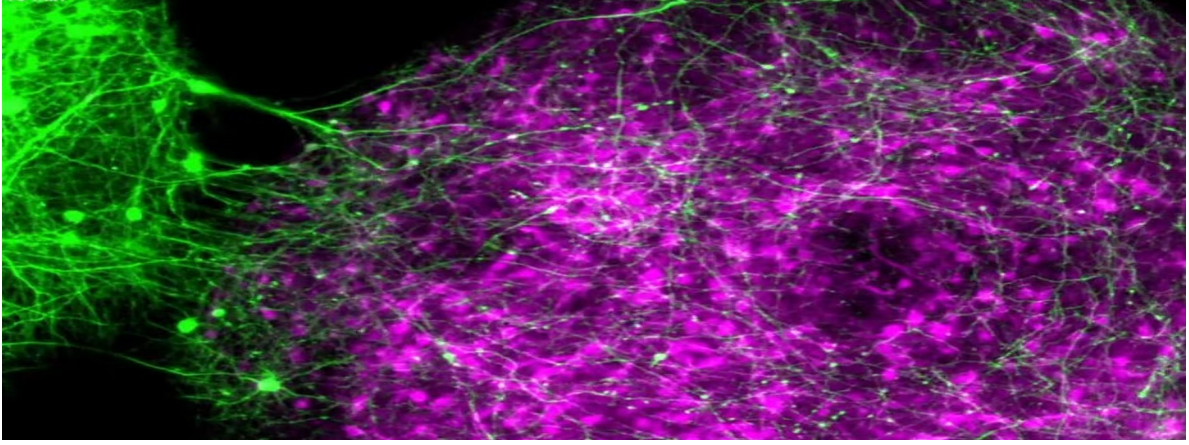
“Give me a child until he is 7, and I will show you the man.” **Aristotle**

One neurotransmitter that comes into play at this early age is neurotensin. Neurotensin is a neuropeptide that functions like dopamine in that it acts like a reward for appropriate behavior, but specifically for the differentiation of “good” from “bad” thoughts. Like dopamine it establishes a threshold level and then “rewards” when behaviors elevate above the current level of behavior. It stems from a survival perspective where we learned which behaviors benefited our survivability but at our stage of evolution may now be more involved with moral and cosmic choices. It is interesting to note that this “reward for improved thinking” mechanism is built into our basic thinking processes. As we age, we are establishing our “... **preconceived opinions, settled ideas, and long-standing prejudices.**” **109:5:3 (1199.4)** and the “old dog”, Zen teaching applies: “A full cup cannot take on more water.”

Side note: Remember Amos, John Mark’s young friend who (like Judas) believed in the gospel but could not be depended on? It is also interesting that the “**whole afterlife will be more happy and dependable because you spent your first eight years in a normal and well-regulated home.**” **177:2.4 (1922.2)**

Even with age, our ability to evolve or “take on more water” is still possible because certain foods (chocolate, tea, blueberries) and lifestyles (less stress, exercise, more love) can create up to 700 new neurons a day and these new neurons, plus epigenetics and our free will emotional control, allows us to improve our thinking habits. Our brain’s ability to adapt involves several mechanisms and new neurons and neuroplasticity also helps us to shape and fine tune our spirit receptivity. Adaptability, cross pollination and growth mechanisms involve many physiologies including microtubules, microtubule-associated proteins and activity regulated cytoskeleton peptides.

There is an area of the brain which specifically deals with tenacity and willpower. It is called the anterior midcingulate cortex. It is involved in certain higher-level functions, such as attention allocation, reward anticipation, decision-making, impulse control, performance monitoring, error detection, and emotion control. It grows with the challenges that are found between the anvil of justice, the hammer of suffering, and the necessity for anguish and fear.



New neurons grow from one area and connect into another.

Let's look at some functions that are not age related.

Changer, Adjuster, Controller

Whether young, mid-life or old, some brain functions are similar. Are there common denominators of how the Thought Changer, Adjuster, or Controller, might interact at the fundamental level of human thinking, and can we help that process?

The Adjuster finds it almost impossible to register these inspiring spirit leadings in an animal mind so completely dominated by the chemical and electrical forces inherent in your physical natures. 110:7.6 (1213.1)

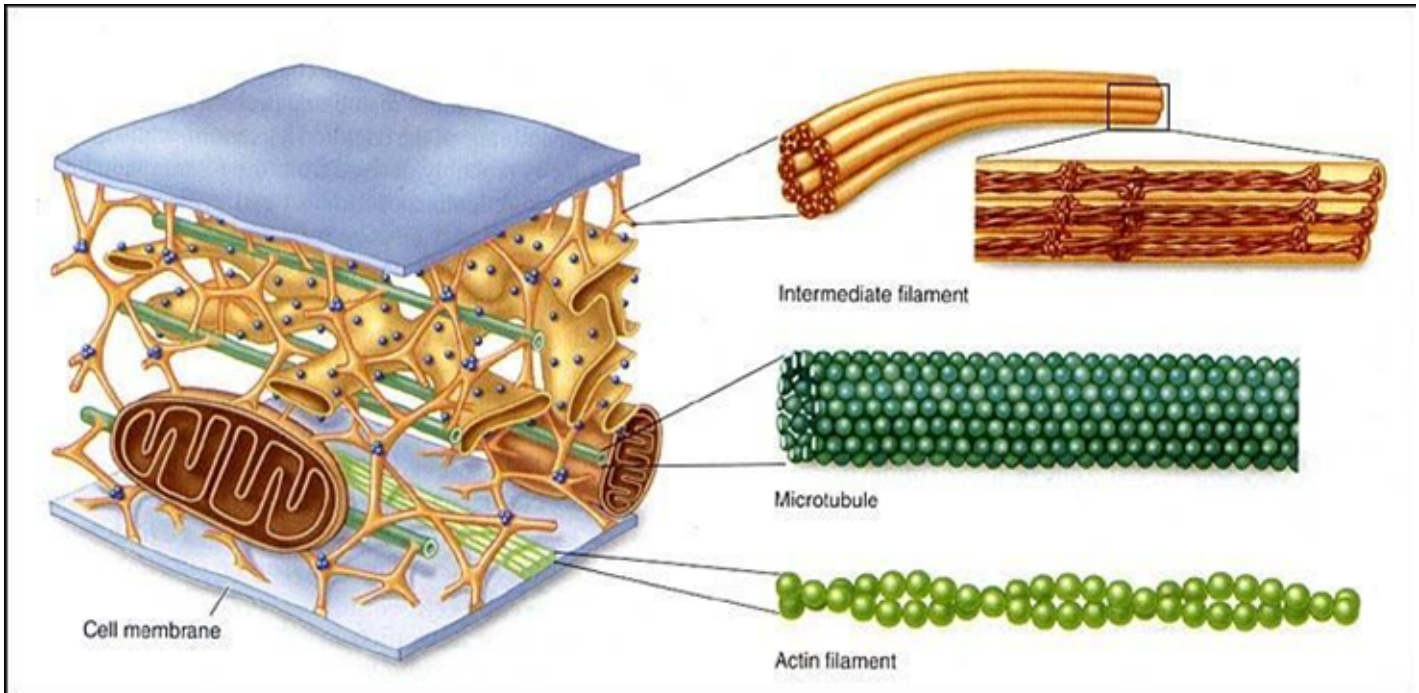
Let's think about how the pure spirit Thought Adjuster, and other pure spirit influences, like the adjutant mind spirits, or even the unqualified absolute, might influence us in this material, electrochemical milieu.

While the hereditary legacy of cerebral endowment and that of electrochemical overcontrol both operate to delimit the sphere of efficient Adjuster activity, no hereditary handicap (in normal minds) ever prevents eventual spiritual achievement. 109:5.5 (1199.6)

How can we get a **“wise co-ordination of material and spiritual forces” 110:6.17 (1211.2)** to augment cosmic visualizations? How might we provide the **“favorable conditions”** of **“loyalty, sincerity, humility, and patience”** that are the **“fulcrums”** for spirit growth? **“... he speaks within the human heart as a still, small voice ...” 148:6:10 (1664.2)**. How might we calm the white noise cacophony and lower those voltage thresholds that might allow us to cross pollenate our thinking and hear that **“still, small voice”** to see the big picture?

When we are taught to **“... remain for a time in silent receptivity to afford the indwelling spirit the better opportunity to speak to the listening soul.” 146:2:17 (1641.1)** perhaps we are being taught to emulate the delta dominant wave state of early childhood which would allow extra processing time and interassociation of thoughts which would afford the Thought Adjuster better opportunity for communication to our soul or superconsciousness. Perhaps this will help us to be more open to child-like learning.

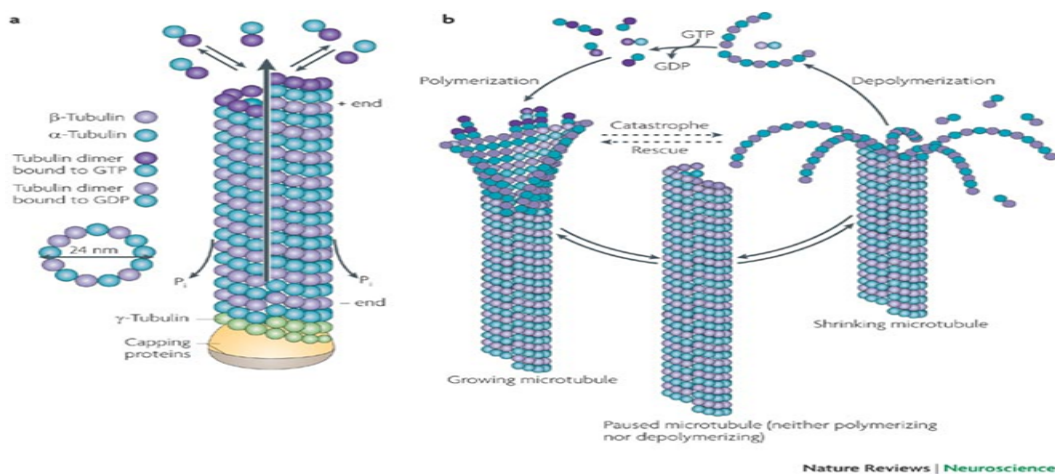
Microtubules



Microtubules

One of our main anatomical features, functioning at all ages and giving us time for silent receptivity, between sensor inputs and our reactions, are microtubules. Microtubules are hollow fiber tubes, with uniquely arranged molecules, which are filled with water, and which form the basic structure and communication mechanism between our cells.

Microtubules constantly grow or shrink in length from 0.000004 in (0.1 μm) to 0.002 in (50 μm) by a dynamically unstable process called treadmilling (technically, guanosine triphosphate hydrolysis) wherein the dimers (individual peptides) are lost at the negatively charged end and more are added at the positively charged “centrosome” end.



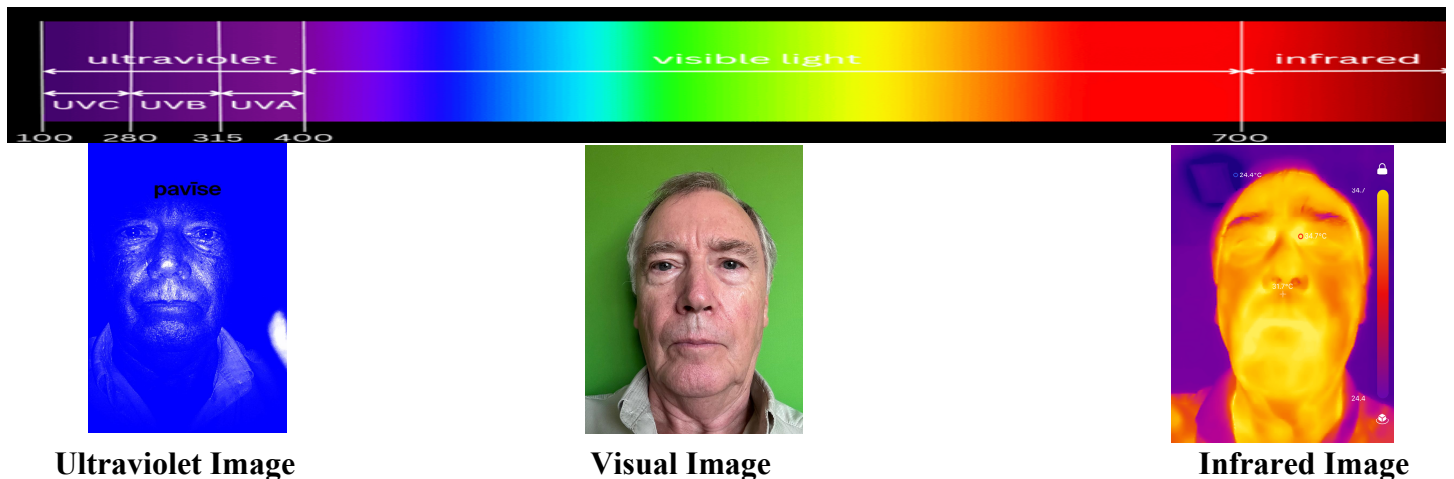
Treadmilling

The tubes are made up of thirteen individual heterodimer (joined but different) tubulin polypeptide filaments, arranged in parallel, around a circular salt water filled cavity. (Ref 46)

The filaments have a distinct electrical polarity that can generate an internally coherent (integrated), soliton (self-sustaining), electromagnetic field (Ref 12, 37) along each of the 13 filaments, and collectively these tubules are sufficiently insulated from neighboring cells to prevent electrical interference (short circuiting) facilitating decoherences (not being influenced by neighboring electric activities) in the order of 10^{-6} seconds (approx. 1 M hertz).

Microtubules are found in all eukaryotic cells (cells with our DNA in the nucleus) so this strengthening and weakening of the cellular intercommunication process is going on throughout the body although we are probably most aware of its influence in the brain where these microtubules are called neurotubules.

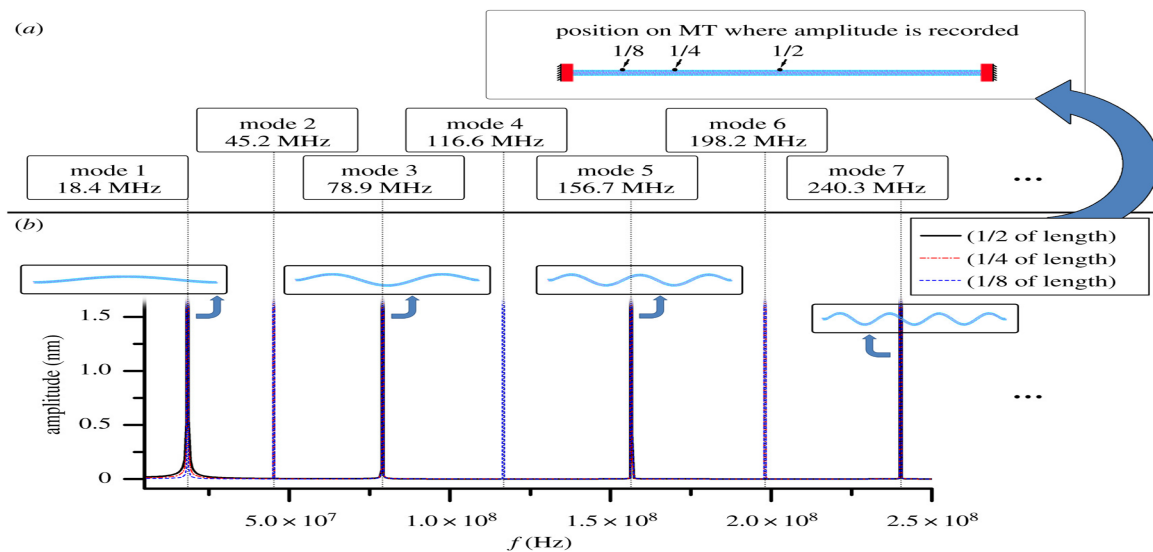
Microtubules, being made up of crystal-like protein dimers surrounding the partially electrically conductive water filled inner core, shuttle the electrical pulses from cell to cell as the pulses move down the individual filamentary strands by a process of cascading luminescence and the length of the tube causes a delay in the propagation called “delayed luminescence”. The signals along the tubules resonate at twelve frequencies clustered in 4 ranges: kilohertz, megahertz, gigahertz, and terahertz frequencies. Specifically 100–400 KHz, 10–30 MHz, 100–200 MHz, in the mechanical vibration range, 1-20 GHz (11.8-to-5.9-inch wavelength) in the radio wave range, and at 526 and 686 cm^{-1} (THz) in the heat, far infrared range (molecular bond stretching and bending) and 276 and 334 nm in the ultraviolet (electron jump) range.



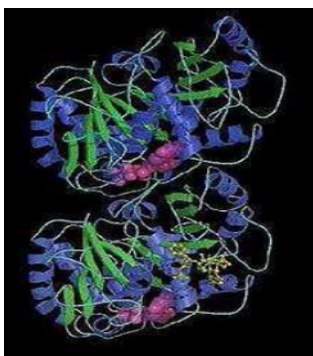
It is interesting to note that at certain frequencies the conductivity of microtubules increases in a “ballistic” manner by a factor of 1000. This electro-mechanical MHz frequency range interacting with the electro-optical range (Ref 14), may be where we “delicately touch” (and perhaps cohere with) our morontial selves, our mid-mind, our souls?

Perhaps morontia material is optical in nature, just above our electromechanical MHz frequency range.

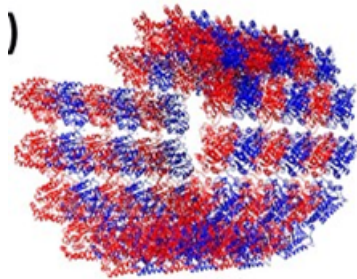
“... vibrations of commingled material and morontia activities ...” 189:1:1 (2020.4)



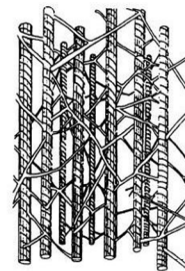
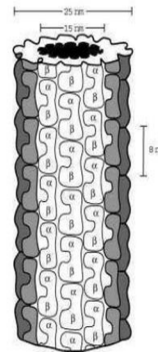
Mechanical Vibrational Frequencies of Microtubules



Individual Tubulin Dimer



A & B Tubulin Dimers make up the walls



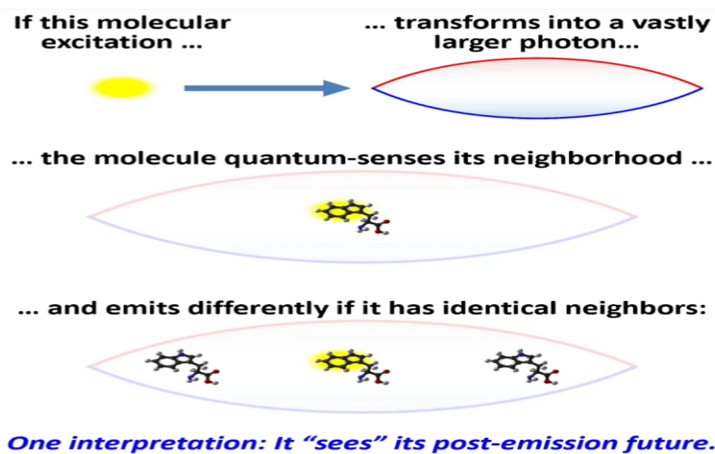
MAPs cross connect

Microtubules communicate between all cells with DNA but function most poignantly in the medial temporal lobe of the brain as a facilitator of cross-communication between brain cells. This is analogous to the cross communication of the child brain before the formation of the insulative myelin sheaths, but this cross communication is now controlled by the free will of our thoughts (think of this as the coordination of material light, intellectual insight, and spirit luminosity) **0:6.8 (9.10)**.

Human consciousness rests gently upon the electrochemical mechanism below and delicately touches the spirit-morontia energy system above 111:1.5 (1216.6)

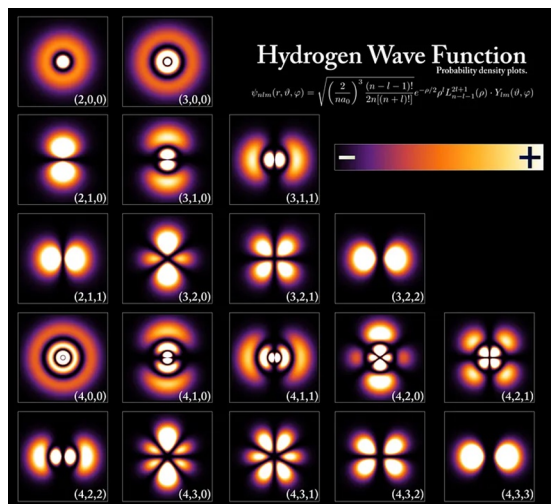
There are about 40,000 A and B dimers that make up the individual tubulin filaments and they have alternating current (AC) polarities with transistor like electrodynamic properties allowing their energies to be amplified and to harmonize with other energies by a form of electro-optical coherence. (Ref 60 & 90) Moreover, the transmitted ac power and the transient fluorescence decay (single photon count) are independent of the microtubule length. Even more remarkable is the fact that the whole microtubule is more conductive than any single protein molecule that makes up the microtubule. The microtubule's vibrational peaks condense to a single mode which controls the emergence of the electronic/optical properties and facilitates automated noise alleviation. Thus, a monomolecular saltwater channel residing inside the protein cylinder displays an

unprecedented control in governing the electronic and optical properties of the microtubule. This provides for bioluminescent optical coherence which happens when a wave travelling down the filament, splits into two or more separate streams (in this case cascading down neighboring filaments) and then these streams interact with each other in a phenomenon called superradiance and sub radiant eigenmodes. Superradiance means that they act both individually, collectively and coherently, as if it were a single cell (like how a LASER works). A sub radiant eigenmode means it displays transparent optical properties in a nontransparent media (Ref 92). It is also hypothesized that since photons travel at the speed of light (essentially being outside of time) they can sense their surroundings and anticipate the field into which they are propagating.



Photon Sense

It is interesting to note that there are three essential amino acid molecules in our body, isoleucine and tryptophan (both used to make proteins), and l' arginine, that are also bioluminescent and are involved in biological signaling, like in the neurotransmitter serotonin. The primary ingredients of the tubulin are a sequence of amino acids, including tryptophan and they form a unique scaffolding as one of the primary structures in microtubules. The tryptophan in the microtubule with its strong ultraviolet absorption, assisted by its significant absorption/emission differences form an ideal fluorescent reporter of biomolecular dynamics. It is also highly sensitive to its protein, solvent, and electrostatic environments. (Ref 91 & 92)



Multiple Patterns of Possible Interaction Mechanisms

The organization and patterning of the time delays both along and between tubules, allows them to function as information modifiers. Because microtubules are arranged in specific patterns and because they are connected by microtubule-associated proteins (MAP1, MAP2 and tau proteins) which act through a process of phosphorylation, and because their interconnected “nodes” tune or “orchestrate” the optical oscillations in what is called “Orchestrated Objective Reduction” (Ref 1, 2, 3,) they may form the basis for our self-consciousness.

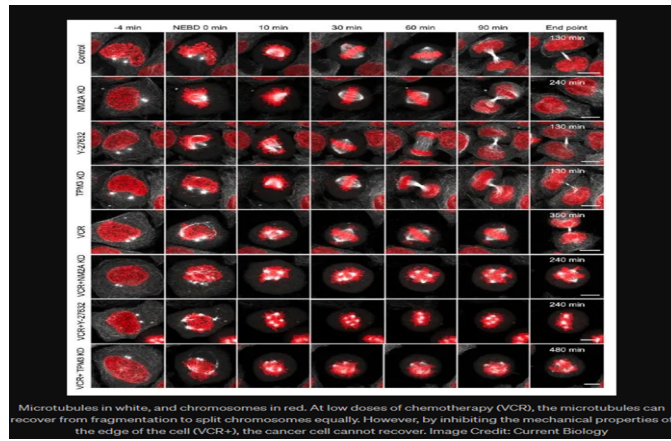
A single brain microtubule’s protein arrangement symmetry allows it to act as a nanowire where the conducting state is written in the wire itself enabling it to store and process approximately 500 distinct bits of information with 2 pico amp resolution between 1 nano amp and 1 pico amp activation currents in an almost hysteresis free fashion. (Ref 89) Rings of these microtubules then form qubits (quantum oscillating dipoles) since they are super positioned (situated vertically on top of one another) in resonant rings and in helical pathways throughout the lattices of the microtubules. Depending on the orientation of the electric fields to the microtubule (or actin filament) axis, there could be three types of ionic waves generated: (a) Longitudinal waves propagating along the protein polymer’s surface where the polymer acts like a conducting electrical cable with its inherent resistance and capacitance. (b) Helical waves propagating around and along each protein polymer, and there could be three or five such waves propagating simultaneously corresponding to the 3-start or 5-start geometry of a microtubule. (c) Radial waves propagating perpendicularly to the protein polymer surface. If an electric field is oriented at an angle to the polymer axis, all these wave types may be generated simultaneously. This allows the microtubule to function as a qubit that can carry information in more than just a binary manner. Theoretically they can encode information in an infinite number of ways.

Orchestrated Objective Reduction is presumed to function in discrete tiny units of time related to the Plank scale of 10^{-35} seconds, that collapse mesoscopic (intermediately sized) objects on a timescale relevant to neural processing.

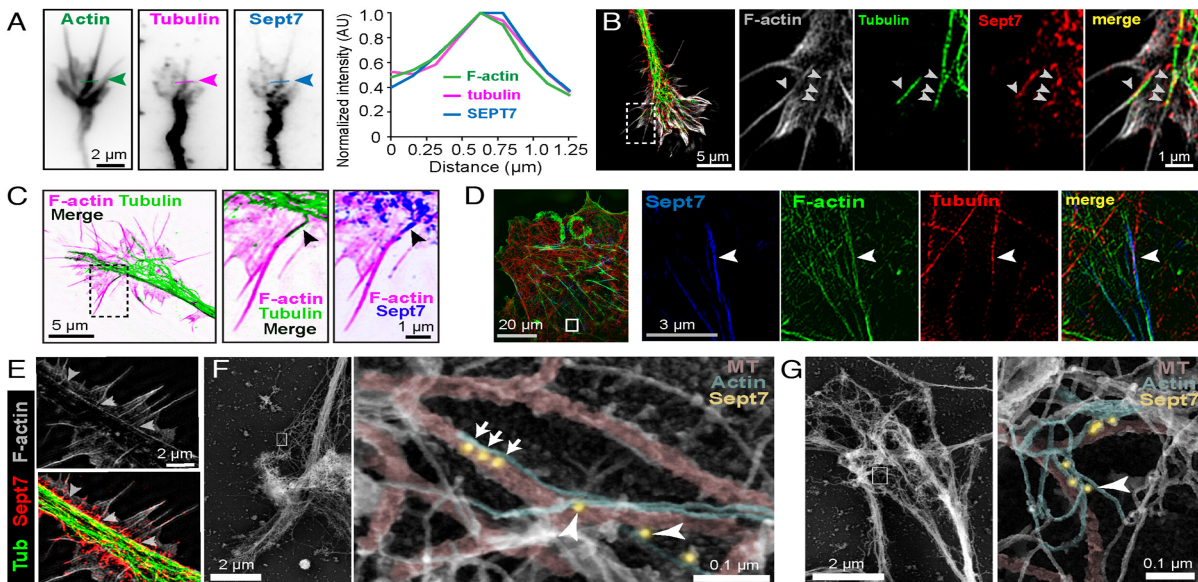
Since microtubules can respond to four octaves of vibration (mechanical, radio, heat, ultraviolet) they may facilitate up stepping or down stepping of the higher frequencies between our low frequency materially functional ranges and higher morontial frequencies. At their lowest electric energy frequencies, they vibrate due to their molecular charge separation, and at the highest frequencies they vibrate due to their electron or nuclear spins. This “orchestra” not only gives us a time delay between a sensory input, but it also affords us the overview of our reaction to that input. It is a kind of pre-consciousness which allows for the consciousness of our consciousness. It does this by introducing a time delay of up to 500 milli seconds between the electrical impulses from the sensors (proprioception, vision, auditory, tactile, vestibular, interoception, and taste inputs etc.) and the post processing of these stimulations.

Side note - olfactory stimulations, smells, go directly to the frontal lobes.

Microtubules also play a critical role in axonal transport (movement of mitochondria, lipids, synaptic vesicles, proteins, and other organelles to and from a neuron's cell body), neuron structure, and plasticity, and when altered, lead to neurodegeneration. Microtubule abnormalities are heavily implicated in Alzheimer's disease pathology.



Microtubules and chromosomes interact at every cell division.



Septins and Actins (binding proteins)

Septins colocalize with overlapping microtubules (Ref 40) and together with actin filaments facilitate intercellular crosstalk.

... true spiritual experience, is the experiential realization of the cosmic reality of the observation of the observation of all this relative synthesis of the energy materials of time and space. 112:2.12 (1228.7)

Microtubule - Quantum Coherence

Every impulse of every electron, thought, or spirit is an acting unit in the whole universe. 56:10.14 (647.5)

Electromechanical energy interacts with electro optical energy in microtubules in a coordinated fashion by reversibly exchanging energy for momentum, back and forth. Two things are “conserved”: momentum (linear and rotational) and energy. Energy is eternal but it can be temporarily transformed into momentum. This looks like discontinuous mechanical motion but the continuous can’t be reduced to discontinuous. You can’t separate

the part from the whole. Neither can you separate the parts of the body from the whole body nor the whole body from the universe. At the quantum level, things directly act as aspects of the whole and they derive their very definition and meaning from that whole. In our case, the Thought Adjuster, being a fragment of the spiritual whole, and the ultimatons, being a part of the material whole, may be our localized presentations of the two “wholes” (material and spiritual). One possible overlapping continuum between material, temporal, transcendental, spiritual energies and “the whole” is quantum electromagnetic energy. (Ref 33) Let’s look at those areas of the brain and nervous system that function at the quantum level. The probabilistic quantum level has some interesting overlaps with the timelessness of spirit energy like, time simultaneity, quantum tunnelling, and action at a distance. (Ref 8, 110)

Electron quantum tunnelling, for example, is associated with ferritin in the substantia nigra pars compacta (SNc) midbrain dopaminergic neurons, as well as all other areas of the body where iron byproducts are found. Ferritin has unique properties that provide for an electron switching mechanism using a Coulomb blockade mechanism (different arrangements make for different conductivities). Normally electrons carry a negative charge and repel each other. However, when electrons tunnel between quantum wells, like those formed in the core of ferritin, they can experience collisions with other electrons that result from the electrons trying to tunnel to the same place. Because only one electron can occupy a space (has ubiety), a second electron that also tries to occupy that space will be repulsed. Ferritin acts as an electron switch that is sensitive to its surrounding electric field. (Ref 111)

The “whole” has meanings at every hierarchical subsystem. The universal system has been called many things; the ether, the quantum field, the quantum vacuum, the metric field, Higgs condensate, a cosmic superconductor, or even an overall instructional interaction where matter tells spacetime how to curve and spacetime tells matter how to move. The Urantia Book differentiates it spiritually as God the Supreme and materially as space.

The Quantum Consciousness Theory states that the quantum phenomena such as those occurring in microtubules, facilitated by their unique properties, involves quantum mechanisms, such as quantum tunnelling (boring through things that would normally appear as impenetrable), superposition (which says that a quantum system can exist in multiple states simultaneously until it is measured or observed), entanglement (which describes a quantum connection between particles that persists regardless of the distance separating them) uncertainty (which states that certain pairs of physical properties, such as position and momentum, cannot be simultaneously measured with arbitrary precision) and wave-particle duality (where photons, for example are particles but behave like waves). These phenomena all allow for the generation of consciousness in ways that classical physics cannot explain. It supports the idea that particles exist in a state of entangled probability until observed. In our case, the collapse of the wave function is observed by us as a thought and is observed and reality-ized, by the Thought Adjuster.

Side note: Neurons individually transmit at about 100 m/s and there are 100 billion neurons x 200 firings per second x 1,000 connections each = 20,000,000,000,000,000 bits of info being transmitted per second, so thought/mind/pattern functions are well above the speed of light and therefore could be considered too be functioning outside of time.

Microtubules have an ability for quantum superposition creating their ability to exist in multiple states simultaneously until a measurement or observation is made, at which point the system collapses into one definite state. Quantum entanglement occurs when particles (because they come from the same source) become interconnected in such a way that the state of one particle directly influences the state of another, even when they are separated by vast distances. They demonstrate the reciprocal interaction between field and particle.

This quantum coherence is an area where classical mechanical behaviors overlap with the wholistic ones and may involve our interface with Supreme spirit energies.

Newtonian mechanics looks at past events while quantum mechanics describes the probability of future events happening. The wave property of particles appears when we start looking into the future of that particle. It is a probability wave because the future is probabilistic. Wave function collapse is what we perceive as the present moment and is what differentiates the past from the future. General relativity (GR) involves making measurements in the observed past and therefore, is predictable. Quantum mechanics (QM) attempts to make measurement predictions of the unobserved future which is unpredictable except for our free will control.

The quantum level of our material consciousness may interact with spiritual consciousness in the equivalent of the collapse of the wave function. (Ref 11)

The endless sweep of relative cosmic reality, from the absoluteness of Paradise monota to the absoluteness of space potency, is suggestive of certain evolutions of relationship in the nonspiritual realities of the First Source and Center—those realities which are concealed in space potency, revealed in monota, and provisionally disclosed on intervening cosmic levels. 42:10.1 (480.4)

Side note: At the center of every galaxy is a black hole which stabilizes the mass of all the stars and planets in that galaxy. Our Milky Way galaxy has a super massive black hole.

Side note: At near absolute zero (no molecular motion) matter can take on new forms (Chiral-Bose state, Bose-Einstein condensate). Paradise has no molecular or electron motion, so would have an unbelievably dense rest mass.

So why do we care about all this? Because thoughts have biological consequences (think blood pressure, heart rate, epigenetics), but more specifically your thoughts control the growth of these microtubules and may affect your spirit receptivity.

It is to the mind of perfect poise, housed in a body of clean habits, stabilized neural energies, and balanced chemical function, when the physical, mental, and spiritual powers are in triune harmony of development that a maximum of light and truth can be imparted... 110:6.4 (1209.4)

The speed of neuron transmission from sensor input to reaction determines the thought cascade. If thoughts of hate and anger are faster than love and forgiveness, they tend to dominate. So, where's the spirit influence in all this?

Quantum coherences only occur at subatomic levels and to a limited degree, in the ultraviolet (electron jump) range. The bioluminescent to mechanical cascade mechanism is made possible by the interactions of the ultraviolet resonance frequencies with the mechanical movements of the microtubules, and this allows us to cohere with non-local energies. Quantum coherence could facilitate influence from the Spirit of Truth, God the Supreme or the universal absolute.

Here are a few luminous possibilities to consider:

Perhaps the mid-mind is optical in nature, just above our electromechanical MHz frequency range. **“where material light, intellectual insight, and spirit luminosity interact.” 0:6.8 (9.10)**

It is interesting to note that scientists can make light behave like atoms and molecules by forcing different environments. They call this “hard light”. (Ref 67, 68, 69) Photons normally have no mass and travel at the speed of light but researchers found that bound photons acquired a fraction of an electron’s mass, and these weighed-down light particles were also relatively sluggish, traveling about 100,000 times slower than normal noninteracting photons.

Let’s take a little side trip here to talk about mass. What is mass? Considering that mass and energy are fundamentally the same, what differentiates them? I like to think of everything as ripples (momentum) in the electromagnetic field. Small ripples result in photons that don’t protrude far enough into what the Urantia book calls “primordial force” blanket of space (42:5.16), what scientists call the Higgs field, and they don’t meet with any resistance in their travels. Matter makes a bigger bump, that protrudes into the Higgs field and is slowed down by space (the Higgs field) and appears to have mass or what The Urantia Book calls “inter-gravity tension of the associated aggregations of matter” (42:5.14).

When the energies of the universe are so slowed down that they acquire the requisite degree of motion, then, under favorable conditions, these same energies become mass. 133:5:10 (1477.5)

Side note: Even the “vacuum of empty space” isn’t empty. It contains gluon field fluctuations (ultimatons 42:4.6).

Getting back to microtubules, perhaps the bioluminescence of microtubules is also why Adam and Eve “**gave forth a shimmer of light**” (74:6:5 (834.7) as they might have had more predominant microtubules?

Material Sons vary in height from eight to ten feet, and their bodies glow with the brilliance of radiant light of a violet hue. 51:1:3 (580.6)

Perhaps the bioluminescence of the microtubules is hinting at concept of the “pilot light” of paper 107? Perhaps the bioluminescence of the microtubules is the “light of truth”?

Human consciousness rests gently upon the electrochemical mechanism below and delicately touches the spirit-morontia energy system above 111:1.5 (1216.6)

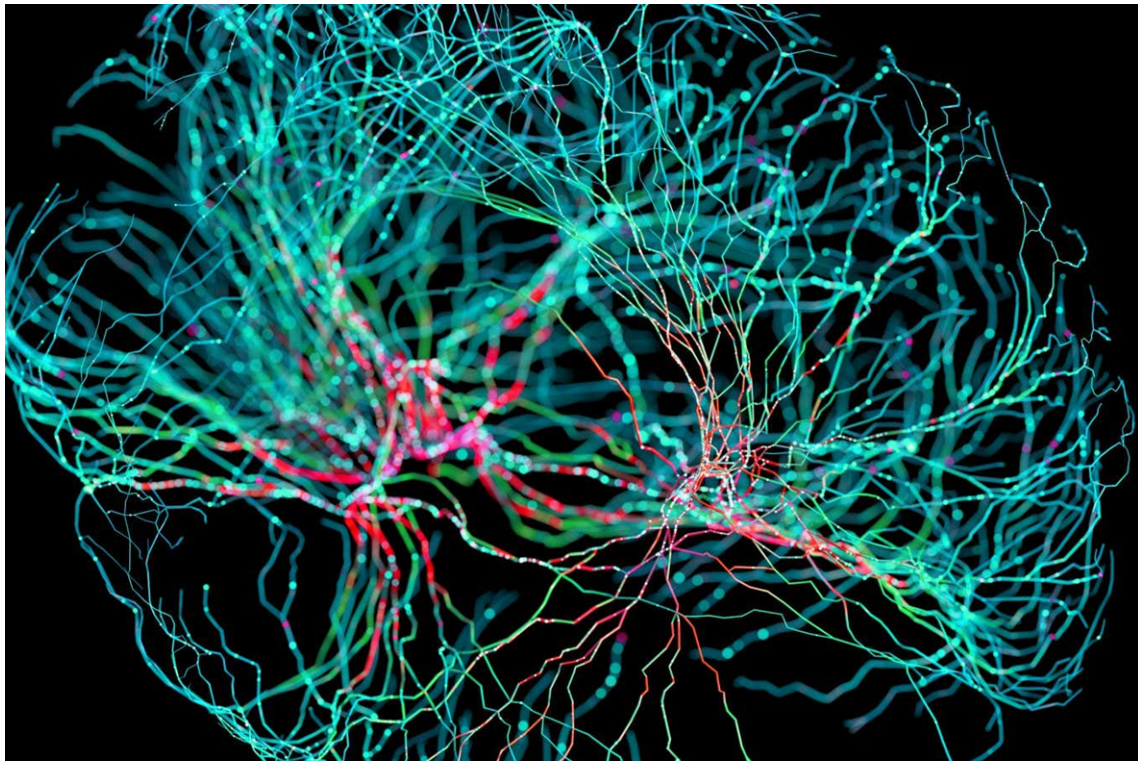
... true spiritual experience, is the experiential realization of the cosmic reality of the observation of the observation of all this relative synthesis of the energy materials of time and space. 112:2.12 (1228.7)

The Supreme One is brilliant beyond description; he is the Light of Lights. Every heart and every world is illuminated by this divine light. 131:4:2 (131:4.2)

As we said before, bioluminescence of microtubules functions most poignantly in the medial temporal lobe of the brain as a facilitator of cross-communication between brain cells. This massive cross communication is like the child brain in the Thought Changer phase, before myelin sheaths formalized and sped up our thinking patterns but these neurotubules in the brain now facilitate this cross communication and they are controlled by our free will. These particle interactions in the mechanical range and the quantum interactions in the optical range are not only coupled locally with each other, they are also entangled with the cosmic whole by Quantum Coherence.

Every impulse of every electron, thought, or spirit is an acting unit in the whole universe. 56:10.14 (647.5)

Since at the quantum level, individual things act as an aspect of the whole and derive their very definition and function from that whole, the Quantum Consciousness Theory says that the quantum phenomena in the microtubules, facilitated by their unique electrically isolated properties, involves all these quantum mechanisms, superposition, entanglement, and wave-particle duality. This link between the atomic and material levels allows for consciousness in ways that classical physics (think mechanical brain activity) cannot explain.



Electric Focal Hubs in the Brain

Microtubules, more appropriately neurotubules, hold a state until a measurement or observation is made, at which point the system collapses into one definite state (a thought). Quantum entanglement occurs when particles become interconnected in such a way that the state of one particle directly influences the state of another, even when they are separated. This can be locally in the brain or over vast distances. Quantum coherence allows for the overlapping of local mechanical behaviors with wholistic ones. This may involve our interface with, our adjuster, the Spirit of Truth, the Supreme or the Absolutes. At the quantum coherence level, our material consciousness may interact with spiritual consciousness in the equivalent of the collapse of the wave function.

Roger Penrose (originator of the OOR theory & 1990s Nobel laureate for physics) says it this way, “consciousness arises when a large number of microtubules in the brain reach a state of quantum coherence, called a “self-collapse of the wave function.”

The far-flung physical universe coheres in the Isle of Paradise; the intellectual universe coheres in the God of mind, the Conjoint Actor; the spiritual universe is coherent in the personality of the

Eternal Son. ... Man's Adjuster is a fragment of God and everlastingly seeks for divine unification; it coheres with, and in, the Paradise Deity of the First Source and Center. 2:7.7 (42.8)

Electromagnetic Continuum

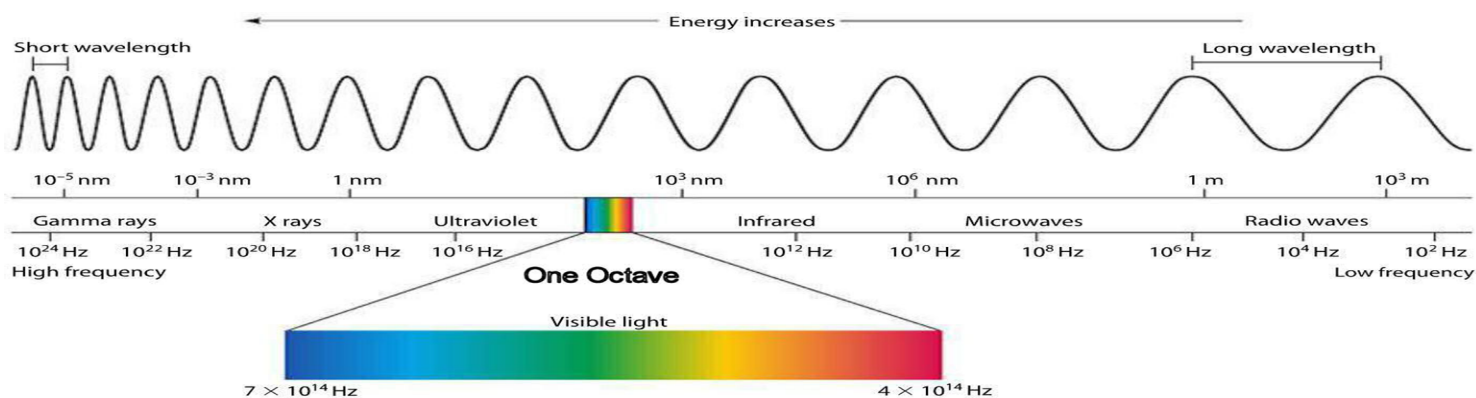
Normally energies only interact within their respective energy range, but the unique structure and function of microtubules allow them to interact across a wide range of frequencies, and all those frequencies are a part of the overall electromagnetic continuum. Let's look at this from an overall perspective.

We live and move and have our being in an electromagnetic continuum and whenever anything changes in our everyday life, there is an exchange of light photon energy and the movement of charge. When objects touch, it is charge that makes contact. Whenever the atoms bond and break there is an exchange of photon energy and the movement of charge. There is a spherical geometry (Huygens' Principle) where every point on a wave front may be considered a source of a secondary spherical wave, which spreads out in the forward direction at the speed of light. This forms part of a continuous process because the absorption and emission of light is spontaneous. Light waves (eternal energy) are continuously interacting with the electrons (material energy) forming photon electron couplings or dipole moments. We can think of this as a process of spherical (think tri concentric) symmetry forming and breaking. When this spherical ($4\pi r^2$) symmetry breaks (becoming a dipole), it has the potential of forming a spiral. A self-limiting dead end. Nothing has lower entropy than a sphere and the absorption of light always comes before the emission relative to the reference frame of the object or life form that is radiating that light. This forms a direction in time with an uncertain future that is not totally random. There is a built-in potential for ever-greater symmetrical formation, and this can be seen in cell life.

At our stage of existence, we convert electromagnetic energy into electrochemical energy and into motion (temporally, unidirectionally) via the transfer of electrons between chemicals. This electromagnetic transfer of electrons involves the conversion of electrical energy into waves of magnetic energy (by-directionally without loss of energy). The stuff that makes us what we are, and how we think, involves the interchange of these two fundamental properties, energy and momentum. Material energy (motion) primarily involves momentum and is temporal while optical energy (light) involves pure energy and is eternal. Both material and optical mechanisms involve the movement of energy.

Light, heat, electricity, magnetism, chemism, energy, and matter are—in origin, nature, and destiny—one and the same thing, together with other material realities as yet undiscovered on Urantia. 42:4.1 (472.12)

Spiritual energy acts in accordance with established laws, just as does physical energy. 44:5.4 (505.1)



Electromagnetic Spectrum

According to The Urantia Book there are 100 octaves of energy in our local universe. **42:5.1 (474.5)** Science currently is aware of many of them.

Within each octave, energies have the inherent ability to interact. At very low frequency the interactions cause heat. Higher frequency interactions facilitate the formation of molecules. The next higher octave results in the formation of material atoms. It is my conjecture that higher octaves are the realm of morontia and spirit material, essentially “hard light” where light acts like material atoms but is made entirely from photons.

Modern unified field theory describes the four primary forces (strong, electromagnetic, weak and gravity) and how they interact in this continuum. My supposition is that we function in the MHz and lower optical range, morontia involves the ultraviolet range (hard light comingled with matter). This is supported by the fact that Adam and Eve could see the midway creatures, but that ability diminished with subsequent generations. The cones in our eyes can still detect UV light but we have evolved a protective mechanism to block its reception (Ref 114). Above that might be the spirit frequency ranges. If spirit energy is high frequency stuff and it is going to interact with the finite, it needs to find ways to influence using sub harmonically resonant frequency mechanisms.

The pattern and organization of the body’s biological system is established and maintained by a complex electro-dynamic field. This electro-dynamic field is determined, in part, by its atomic bio-chemical components, which in turn determines the behavior and orientation of those components. This field is electrical in the physical sense and by its properties it relates the entities of the biological system in a characteristic pattern and is itself in part a result of the existence of those entities and can be influenced by the whole.

The Thought Adjuster’s challenge then is to learn which frequencies in his vocabulary (likely above the 10^{24} Hz range) can find sub harmonic resonances with our low frequencies. This is where the microtubules come in with their ability to interact with both light frequencies (ultraviolet in the 10^{15} Hz range), and our material neurons functioning in the kilo Hz range. Microtubules, with their bioluminescence, might be a sub harmonic resonant step-down mechanism.

The Thought Adjusters would like to change your feelings of fear to convictions of love and confidence; but they cannot mechanically and arbitrarily do such things; that is your task. In executing those decisions which deliver you from the fetters of fear, you literally supply the

psychic fulcrum on which the Adjuster may subsequently apply a spiritual lever of uplifting and advancing illumination. 108:5.8 (1192.3)

“Literally” “the psychic fulcrum” might be our “Christ like”, “Spirit of Truth”, “fear not”, patterning of microtubules. We can choose what we do in the time between sensory input and our reaction, our free will intervention time. We can either choose to remain animally, fear based, materially conscious, or we could pattern our microtubules by co-creatively focusing on fearless Christ consciousness. Our microtubules will grow and shrink as required to maintain those prechosen superconscious patterns of thinking. Evoking the “fear not” peace filled “mind of Jesus” (activating the Spirit of Truth) may allow temporary changes to microtubule lengths that facilitate temporary Christ like thinking and with repetition these patterns might become our homeostatic norm.

The spirit of truth is **“fact as well as in truth” 52:5:5 (596.3)**

The “fact” may be the ultraviolet “picture” of our bioluminescence and until the TA learns to speak directly to us, or we can quiet our mind chatter to better “see the light”, the only available interactions may involve quantum coherences where the material parts of us sense being a part of the cosmic whole.

Morontial Material – Hard Light

Perhaps, in the electromagnetic ascension continuum, we move up in frequencies from matter, to morontia to spirit energy formations. We might ascend from the very slow rotational energies of matter (fermions and bosons) to artificially maintained morontia material, (bosons with mass), to the massless (and hence eternal) bosons of spirit energies.

In support of this idea, a few universities have successfully forced light to behave like atoms with the addition of different energies. They have slowed light to have small amounts of mass (about 100 times that of an electron) and make it exhibit the natural tendencies of matter to form compounds. (Ref 67, 68) This “hard or solid light” may be our first glimpse at morontia matter.

The local universe consists of three degrees, or stages, of reality manifestation: matter, morontia, and spirit. 103:6:7

...one hundred physical elements, but likewise have exactly one hundred forms of a unique energy organization called morontia material. 48:1:3

Mankind is slow to perceive that, in all that is personal, matter is the skeleton of morontia, and that both are the reflected shadow of enduring spirit reality. 189:1:3

In a further stretch of the creative imagination, I suggest that dark matter (where “dark” means unseen) is morontia material. Dark matter is found by using gravitational lens mapping, to be spatially collocated with regular matter in astronomical mapping. (Ref 70) Spirit energy may also be dark energy, but I have no hard science to back up that supposition.

Physiological Continuum

Just as there is an electromagnetic continuum, from the stationary isle of paradise, through the high frequencies of spiritual realities, down to the megahertz ranges where we function, there is also a physiological electromagnetic continuum. At the very base of our individual physical identity, there is our fundamental descriptor, our DNA. Our DNA gives us our potential. Our DNA has the potential of creating the multiplicity of proteins that make up the various cells in our bodies. Based on our DNA, each cell creates the proteins necessary to be what it is supposed to be. Some become brain cells while others become gall bladders. How does DNA know what to become? How does it know how to fold to become a brain or a bladder cell? It turns out that the electrical environment of the cell has that “knowledge”. As the cells are multiplying, as the DNA strands are unzipping and multiplying, they are influenced by the electric fields that surround them. Their folding is also modified by epigenetic manipulations of the local electric field, and this determines what proteins are being formed. In other words, the same DNA folding in the brain electrical milieu becomes brain cells and those folding in the bladder electrical patterns become bladder cells. This was experimentally demonstrated by Michael Levin (Ref 48) in his work with flatworms. Electrical intercellular communication is facilitated in part by microtubules because of their electrical surface charges. This intercellular communication based on its electrical interactions, not only determines what is being formed but it also establishes the cell’s cooperation with neighboring cells.

Side note: Cancer cells are still the original cells (brain or bladder), but they have stopped communicating with neighboring cells. (Ref 45) They have rebelled and think they can make it on their own. Think of Lucifer.

Although the human body may be too large and complex to be quantum entangled in the literal sense, our subjective experiences of connection with others may often mirror this quantum phenomenon. The deep social bonds we form with loved ones, the sense of shared experiences, or moments of profound empathy where we seem to feel another’s emotions as our own, all these experiences evoke a kind of “psychological entanglement” reminiscent of quantum connections and the non-local nature of quantum entanglement finds a parallel in how we maintain these connections with others across vast distances. There is a sense of connection when thinking of a loved one far away. There is also the phenomenon of simultaneous invention where multiple people develop the same idea (kindred minds) independently, which hints at a kind of entanglement in the collective human psyche.

The sensing of our electromagnetic environment, (Ref 49) with its associated communication mechanisms, determines our flow, from DNA to protein, from cell to neighboring cell, from neighbor to neighbor, from man to God, from day to day, from year to year, from here to eternity. It’s all about local relationships.

Everything nonspiritual in human experience, excepting personality, is a means to an end. Every true relationship of mortal man with other persons—human or divine—is an end in itself. 112:2:8 (1228.3)

These relational flows are all influenced by our body, our self-awareness, our calmness, our local focus, and our overall God consciousness. All these processes incrementally influence how we proceed and we in turn, influence the people around us, enhance our sense of connectedness, and increase our sense of cosmic citizenship, the Supreme, and God himself.

Single and Multiple Quantum Coherence – SQC and MQC

First, we should define what we mean by quanta. Quanta, in physics, is a discrete quantity of energy proportional (in magnitude) to the frequency of the radiation it represents. Essentially it is the smallest transferable/exchangeable energy packet. In light it is a photon, in electromagnetism it is the gluon, in gravity physicists are still looking for a graviton.

In the electromagnetic nature of our physiology, there may be possibilities for magnetic coherences with spiritual forces. For example, very recent research into the nature of consciousness (Ref 65, 104) found evidence of multiple quantum entanglement using fast nuclear magnetic resonance (echo planar) imaging, to study brain protein physiology. They found that the thought processing areas of the brain functioned at the quantum level and using an intermolecular approach known as multiple spin echo (boosting the initial T2 echo) they found that different areas of the brain demonstrated multiple quantum coherences. In addition, there was evidence of single quantum coherence in the cerebral fluid itself showing up in the dipole-to-dipole interactions like the normal T1 (fat enhanced) T2 (water enhanced) relaxation and rotational symmetry measurements.

Let's reflect for a moment on magnetic resonance. The magnetic resonance process involves placing the subject in a strong magnetic field and then superimposing a variable radio frequency electromagnetic field. The nuclei of the individual molecules, aligned by the strong magnetic field, are vibrated (jiggled) out of alignment, and the time taken to realign (T1 fat, and T2 water, relaxation times) are a function of the properties of their nucleus. The fact that water has a strong tendency, and most other molecules have a general tendency to align with a magnetic field, implies an overall reference field. In the magnetic resonance machine, the nuclei align with the coils, on Urania the nuclei align with the earth's magnetic fields, in the universe fields align with the energies flowing out of Paradise. We have a magnetic orientational relationship (coherence) to Paradise.

Side Note: There is also a coherence between our light sensing and our magnetic orientation. (Ref 113)

Side note: To build a reference map, time consciousness is required. To orient the map, we need a cosmic orientation. The nuclei of our cells may be providing that orientation.

By using cross-recurrence-quantification-analysis, to characterize and quantify interrelationships between nonlinear time responses, researchers also found a 300 to 450 millisecond delay between the EEG signal and the related blood flow pulse oximetry signal. (think heart mind relationships) This delay was found to be location specific and was a function of awareness and wakefulness.

Side note: Quantum coherence in microtubules is temperature dissipation limited. "Warm, wet and noisy" environments cause decoherence, so mental noise or things that raise our core body temperature and inflammation prevent coherence. Remember too, that thermoregulation stops during REM sleep so stay cool, calm, and collected. (Ref 4)

Magnetoencephalography (MEG) studies show brain oscillations of specific frequencies can be found in the cerebral cortex. For example, localized frequencies between 80 and 200 Hz have been related to epileptic seizure events. Magnetoencephalography may also demonstrate a magnetic alignment or orientation with Paradise since our cells have this tendency to exhibit a magnetic bias or orientation.

There is a "brain atlas" (voxel map) that shows the various frequencies that dominate the areas of the brain and MEG is a tool that has been used to study the dynamics and connectivity of these large-scale brain activities (as

opposed to atomic level connectivity) and their interactions with the body and its environment in functional body and other brain states. MEG measures the magnetic fields produced by the electrical activity of the brain (as measured in delta, theta, beta, gamma wave activity) using arrays of SQUIDS (superconducting quantum interference devices) or SERFs (spin exchange relaxation-free) detectors.

Remember the “random” nature of molecules transferring their signaling molecules as they bump into their neighbors? This so-called randomness may be another possible area of spirit influence, at the small-scale brain activity, and this would show up here as another form of coherence.

... the phenomenon of stimulus-response is not a mere mechanical process since the personality functions as a factor in the total situation. 112:1.13 (1227.3)

Time

We can talk about “relaxation” times but what is time? The material ego needs time and is impatient because it feels limited by time. Spirit is eternal. Spirit is patient because it has all the time it needs.

Time is a parameter. More specifically, time is only “perceived” by the analysis of motion and motion can only occur in space. Are you spatial or temporal? What part of material space is the real you? Does time allow the materially finite to coexist with the spiritual infinite?

Relationships to time do not exist without motion in space, but consciousness of time does. Sequentiality can consciousness time even in the absence of motion. 12:5:5 (135.4)

Time comes by virtue of motion and because mind is inherently aware of sequentiality. 12:5:1 (134.6)

“Now” is the intersection of “what was” and “what is yet to be”. Other than the present moment, time only exists as the apparent sequence of spatial events. It only exists as a memory or prediction in the brain or mind. We can remember the past, we can predict the future, but the intersection of the two is the only “time” real to us. We have used different motions to measure time, candles, water, a pendulum, a vibrating crystal, atomic motion and given the instantaneous communication between photons, and other apparently simultaneous phenomena we should question the reality of time. IMHO time is a convenient mathematical tool to predict the future based on our observations of the past. i.e. a tool based on Newtonian observations. Our brain and mind, however, are not bound by Newtonian physics. We can choose to function at the quantum relativistic level of consciousness, and incrementally nudge our future.

I have a position in space and a movement through that space. I also have a depth of personality with drives, attitudes of self-realization and reactions to my environment. I can, over time, also develop a breadth of insight, a coordinating and unifying ability, giving my life future meaning and value. (Ref 112:1.5) It could be that I am slowly trading time (the shadow of spirit) for the real value in a light based morontia dimension as I grow my soul.

The eternal real is the good of the universe and not the time illusions of space evil. 102:3.15 (1122.11)

Material things change with time, truth does not. The search for truth is the search for eternal things. As we age, we have more past to refer to as we are solidifying in our minds our chosen path from the many possible paths opening to us at each moment. As we age, the present moment becomes a smaller and smaller part of our total existence. As we age, we have more experience from which to draw the wisdom required to make the right choices. Infinity is the sum of all the possible outcomes of time.

The more you focus on the past or future - the more you miss the present. Eckhart Tolle

Animals do not sense time as does man, and even to man, because of his sectional and circumscribed view, time appears as a succession of events; but as man ascends, as he progresses inward, the enlarging view of this event procession is such that it is discerned more and more in its wholeness. That which formerly appeared as a succession of events then will be viewed as a whole and perfectly related cycle; in this way will circular simultaneity increasingly displace the onetime consciousness of the linear sequence of events. 130:7.5 (1439.3)

An experience is good when it heightens the appreciation of beauty, augments the moral will, enhances the discernment of truth, enlarges the capacity to love and serve one's fellows, exalts the spiritual ideals, and unifies the supreme human motives of time with the eternal plans of the indwelling Adjuster, all of which lead directly to an increased desire to do the Father's will, thereby fostering the divine passion to find God and to be more like him. 132:2.5 (1458.2)

How long before you will regard time as the moving image of eternity and space as the fleeting shadow of Paradise realities? 189:1:3 (2021.2)

When physical conditions are ripe, sudden mental evolutions may take place; when mind status is propitious, sudden spiritual transformations may occur; when spiritual values receive proper recognition, then cosmic meanings become discernible, and increasingly the personality is released from the handicaps of time and delivered from the limitations of space. 65:8.6 (740.2)

The sense of indivisible unity transcends time and space.

Time Consciousness

The entorhinal cortex (EC) is the early critical first stop area of the brainstem/midbrain and it functions as a network hub for memory, navigation, and the perception of time. For material processes, our perception of time is really our conscious perception of the previous patterns of electrical energy at multiple levels in our bodies.

To achieve the "integration of diverse elements, relationships, or values" (Webster's definition of coherence) we need to cross-reference time and space. To relate space, the EC has grid cells that fire when we move (imaginatively or actually) that gradually build a memory map or grid reference of our location and since we measure motion by time, we need a time reference. We need time references for all relationships, even a personal relationship to our own progress. We need time for our relationships to others, our relationship to Paradise, and our relationship to God.

To perceive time duration, the brain needs either a repeatable or stationary reference. There are a few ways to get a time reference. One would be our circadian rhythm; another would be the rhythmic pulsations (3.75 to 7.5 Hz) coming from the limbic hippocampal regions as seen in the Theta waves. Another would be the gradual buildup of different chemicals. Yet another possibility would be if the EC could reference something stationary or "outside of time". This could be the influence of our changeless personality, our homeostasis, or the timelessness of the Thought Adjuster.

Personality is uniquely conscious of time, ... 112:0:16 (1227.6)

Personality creates a unique time sense out of insight into Reality plus a consciousness of presence and an awareness of duration. 12:5.9 (135.8)

The motion of time is only revealed in relation to something which does not move in space as a time phenomenon. In the universe of universes Paradise and its Deities transcend both time and space. 130:7:4 (1439.2)

The EC with its time derived grid map, is also the main interface between the hippocampus (limbic, “fight or flight” declarative memories and spatial relationship) and the neocortex (computation, attention, thought, perception, and episodic memories). The EC-hippocampus system can time sequence the past, present, and future as related variables so it plays an important role in autobiographical, episodic, semantic, and spatial memories including their formation, consolidation, and optimization during sleep. The Thought Adjuster and Theta wave periodicity are both most prominent during sleep. **110:5:5 (1208.4)** The entorhinal cortex hub of the brain, with its myriads of logic circuits, continuously responds and adapts to stimuli, strengthening some connections, and weakening others. The process of intercommunicating and strengthening or weakening also involves the lengthening or shortening of the time delays of cytoskeletal microtubules. (Ref 39)

We see time as the observation of things evolving and there are two kinds of time:

1. Mind time: the observation of energy/matter changing its location (motion).
Chronos - time duration as measured by a chronometer or a Chronoldek.
2. Spiritual time: Spiritual progress or our movement towards God/unity.
Kairos – representing information at the right or opportune time as measured by The Ancients of Days.

Our different perspectives of time tend to influence our actions. We experience time materially as a sequence of events whereas we experience time spiritually by the effects of time on our sense of peace, happiness, and security. Memories too need sequence, and we need memories to evaluate our progress. The genes in our DNA give us our geological and ancestral memory, and our life experiences give these ancestral memories, current, localized, present day, meaning. We relate our history to our current location and time sense, and then integrate that into the larger chronological, cosmic, and timeless perspectives to give it more meaning.

Side note: Recent Alzheimer’s research has found that the EC is larger for those individuals who live longer. From the Urantia Book’s perspective, a larger EC can look further back in time and extrapolate further into the future.

Multiple Physiological Clocks

There is a direct relationship between maturity and the unit of time consciousness in any given intellect. 118:1.3 (1295.3)

The entorhinal cortex, with its relationship to theta waves and other time sensitivities give the brain a fundamental sense of time but there are many other ways to sense time. Special “time cells” in the hippocampus are linked with “place cells” by shared firing properties. Other cells measure time (like it’s time to rest) by the buildup and breakdown of proteins. At the yearly level there are also biological markers of our “age”. The lengths of telomeres (tail ends of our DNA strands) get shorter during cell manufacture and result in things like, grey hair facial wrinkles and even facial temperatures (cooling of the nose and cheeks). Our circadian rhythms, at the daily level, are sensed by the rotation of the earth in the brain’s insular cortex region of the brain and radiation from pulsars may give our atomic nuclei a time sense for interstellar correlations. Our circadian sense

of time is also related to the buildup of chemicals and our detection of blue light by a pair of neuron clusters in the hypothalamus situated directly above the optic chiasma that receives photic input from the retina via the optic nerve (Ref 112). In the case of daily tiredness, it is the balance between adenosine and melatonin. At the hourly level, we are aware of chemical changes (hunger, thirst etc.). Microtubules give us an awareness at the millisecond level, and nuclear spins give us a reference at the attosecond level. All these evaluations are made in the present, although the past created these current conditions.

Remember the Urantia Book definitions of time? Mind time (material motion) and spirit time (movement Godward). Our body senses time electrochemically by relating to its surroundings, perhaps we should intellectually sense our spirit time, by sensing and relating it to the cosmos.

Thought Feedback Loop

The locus coeruleus (LC, sometimes called the “Blue Spot” of the brain) is an area of the brainstem that is the primary source of neurons known as “catecholaminergic” neurons, because they produce the catecholamines, dopamine and the neuromodulator norepinephrine (Ref 110). The LC is involved with our physiological responses and is critical for numerous functions including the response to stress (Ref 19), attention, emotion, motivation, decision making, learning and memory. The locus coeruleus-norepinephrine (LC-NE) system with its phasic (time sensitive) and tonic (amplitude sensitive) microtubules, functioning at the quantum level, is capable of instantaneous, as well as time-based influencing of our thought processes, and could be the basis of our reflective thinking, thought feedback loop. We are not our thoughts. We are the observers of our thoughts, and the observation of thoughts is what I call the thought feedback loop. That is: first there is the thought, then the reflection of the consequences of that thought which then triggers rethinking. Slight changes in the time delays may be one way that the adjutant mind spirits or our Thought Adjuster or for that matter the Unqualified Absolute, might nudge our thinking towards mid-mind functioning. The Thought Adjuster may influence our thinking by nudging the time delays of the cascades of electron jumps as they flow through the brain on route to the executive areas, around this feedback loop, and then, more importantly, back again (times 10) for more reflective thinking. This may be most effective at the thought precursor stage (based on our preauthorized allowances) because after that, our active free will takes full control of the thought processes. Exceptions may be in the case of deep meditation, (Ref 32, 38) and worship where the lower frequencies can be given a few more milliseconds for reflective cross pollination of our thinking.

Come into the kingdom free from prejudice and preconception; be open-minded and teachable like an unspoiled child. 170:2.20 (1861.2).

Heterophenomenology is the study of first-person phenomena, from the third-person point of view. This may be another name for our awareness of this feedback loop, between the thought precursor, the thought, and the realization that we can (with spirit guidance) physiologically influence that self-reflective thought process.

Near Death Experience – NDE

Most NDEs (Ref 17) result in positive transforming changes and sudden spiritual growth. People often report (a) separation from the body with a heightened, vast sense of consciousness and recognition of death; (b) travel to a destination; a meaningful and purposeful review of life, involving a critical analysis of all actions, intentions, and thoughts towards others; (c) a perception of being in a place that feels like “home”, and (d) a return to life. The near-death experience may have a spiritual result but let’s look at some of the electrochemical physiology that might be involved in this spiritual uplift. As blood flow drops, the oxygen

levels which generate the cellular electric potential also drop. Also, near clinical death, there is a burst of Gamma frequency range brain activity probably related to an intercellular capacitance reduction. (Ref 72) Our intercellular communication and our thoughts, are normally separated and specifically cross connected through troughs and zones of “local minima” voltages. A reduction of available energy to maintain these voltages may facilitate massive synapse cross communication (think life review, calmness, connectedness). It may also reduce the veto power of our free will and allow the adjuster’s patterning to dominate our thinking. Some drugs, (Ref 30) like tryptamines (“vine of the soul” ayahuasca, psilocybin and N-Dimethyltryptamine, which are structured like serotonin), and are called “Spirit Molecules,” may have the similar effect of lowering the voltage walls of our thought channels allowing for decrease segmentation, longer temporal thought processing, and massive hyperconnectivity.

Rick Strassman, the first American researcher to receive government approval to study hallucinogens between 1990 and 95, as clinical associate professor of psychiatry, administered roughly 400 doses of N,N-dimethyltryptamine (DMT) to nearly 60 patients at the General Clinical Research Center of the University of New Mexico Hospital. His findings were initially confined to clinical work recording the physiological effects of DMT, such as heart rate and blood pressure, but he couldn’t deny the overwhelming religious experiences reported by participants and he reported these in his book, DMT: The Spirit Molecule. (Ref 85) Strassman also relates this to the pineal gland and near-death experiences.

“This tiny organ, the ‘seat of the soul’ or ‘third eye’ of the ancients, might produce DMT or similar substances by simple chemical alterations of the well-known pineal hormone melatonin, or of the important brain chemical serotonin. Perhaps it is DMT, released by the pineal, that opens the mind’s eye to spiritual, or non-physical, realities.” - Strassman

There is evidence (Ref: Robin Head of the Psychedelic Research Group within the Centre for Psychiatry at Imperial College London) that when taking drugs like psilocybin the brain’s default mode network reverts to a childlike “selfless” state. The brain’s default mode network, which mediates self-referential behavior, moral reasoning, and imagining of the future, probably influenced by our superconsciousness, is most active during resting states (such as meditation and worship).

When death overtakes a human being, the Adjuster remains in the citadel of the mind until it ceases to function as an intelligent mechanism, about the time that the measurable brain energies cease their rhythmic vital pulsations. 112:3:4 (1230.2)

Emotional Processes

Emotions (Ref 18), which are controlled by peptides in the amygdala, are a function of the difference between what we anticipate and what we experience, and this is, in turn, a function of the time delayed processing of the sensory inputs that trigger those anticipations and our related reactions. Processing delays give us time to appropriately respond, rather than animalistically, immediately, reacting to those sensory inputs. This delay allows us to control our emotions, rather than having our emotions control us. Happiness results when our expectations match our experiences. Happiness evolves when we trust that whatever occurs is not only acceptable but beneficial. When we trust in the unassailability of our spirit nucleus, when we have a real faith-trust in **“the gracious, acceptable, and perfect will of God.” 143:2.4 (1609.5)**

The ventromedial prefrontal cortex (vmPFC) comprises several distinct cytoarchitectonic areas in the medial temporal lobe. It is a key brain region supporting our decision-making processes, and it has been shown to be

one of the main hubs of the Default Mode Network. (Ref 31, 109) The Default Mode Network is a superconscious network activated during calm states such as meditation, hypnagogia (Ref 24) and light sleep that mediates self-referential behavior, moral reasoning, recollection, and imagining the future. The vmPFC is a relay center that provides somatic markers connecting mental representations with secondarily associated emotions. When mental representations are being compared, contrasted, selected, and singled out, it's the somatic, gut level, (think serotonin) intuitive markers that dominate. (Ref 28) One of the vmPFC's functions is to filter out the less relevant inputs, prioritize and connect the rest, in patterns for future reference.

Side note: A familiar drug, ecstasy, (MDMA or 3,4-Methylenedioxymethamphetamine) causes the continuous release of serotonin and dopamine and blocks their reuptake mechanisms causing a sense of equanimity and positive self-regard that enables the user to calmly and compassionately reexamine past events. It also has neurotoxicity if used more than once. (Ref 79)

Side note: The adjutant mind may be a very restrictive filter on the infinite mind, limiting our discernment to those things necessary for survival whereas the cosmic mind may be a less filtered version of mind that allows more connected reflecting.

French philosopher Henri Bergson said it this way: "The function of the brain and nervous system and sense organs is in the main eliminative and not productive."

Consciousness of the connection between our emotions and our memories, allows us to look before we leap, as we imagine God's plan, our participation in it, and calmly anticipate any future joy that may result from it. Emotions and our creative anticipatory imagination are influenced by curiosity (self-consciousness), aesthetics (material consciousness) and ethical sensitivity (God consciousness). The prefrontal cortex can also be an experience simulator capable of both the anticipation (looking) and the realization of the consequences of that anticipation (leaping) and their related emotional reactions (reflecting). We can simulate God's plan, our potential contribution to it, and our emotional reactions from our anticipated participation in it.

Passionate emotional involvement may be particularly useful in the zeal of execution, but we may want to limit those emotions that often distract us from God consciousness and the confidence in his ability in our preparatory thought processes.

Harness your energies and bridle your passions; be calm while you await the majestic unfolding of an endless career of progressive adventure and thrilling discovery. 195:5:10 (2076.1)

Emotional Self-Mastery

Our amygdala (our emotion control center) preprocesses input signals before sending them onto other parts of the brain for rational overcontrol. An emotional response causes changes in the gene expression of certain cells (which results in hormones, neurotransmitters, and other messenger molecules) which do things like increase your blood pressure, adjust your breathing, tense your muscles, or stand the hair up on the back of your neck. (Ref 22) One example of an emotional condition, fear, involves the presence of calcitonin, a gene-related peptide, which is created by all fears and this peptide relays signals to other areas of the mid brain. It is also a hormone that blocks the activity of osteocytes that break down the calcium in your bones and act within the central nervous system to inhibit gastric acid secretion. Fear is mediated by dopamine from the amygdala. Can you see how dominoes are all influencing each other?

The planetary life-planning laboratories are situated on the second satellite of this world number two. In these laboratories the Life Carriers and all their associates collaborate with the Melchizedeks in the effort to modify and possibly improve the life designed for implantation on the *decimal planets* of Nebadon. The life now evolving on Urantia was planned and partially worked out on this very world, for Urantia is a decimal planet, a life-experiment world. On one world in each ten a greater variance in the standard life designs is permitted than on the other (nonexperimental) worlds.) 36:2.15 (398.2)

What things are, or were, in our control?

- our emotional state, where we are, our brain state, our current level of fear, our interpretation of the situation, our environmental memories, memory interpretations, physical status, hormone levels (testosterone and other stress hormones, calcitonin GABA, etc.), neuroplasticity, experience, epigenetic modifications.

What things do we have no control of?

- cultural or genetic predisposition and our base DNA.

There are implicit (emotional), explicit (intellectual) and functional memories in our schema or current mental model. Some implicit memories are present at birth. Our hippocampus centric, explicit memory, aided by our cognitive processes of thinking and understanding are different yet deeply interconnected to our implicit emotions, our feelings, and sensations. There is the default mode circuit, the salience circuit, the attention circuit, the negative affect circuit, the positive affect circuit, and the cognitive control circuit.

The three main areas of the brain that control our emotions are:

The amygdala which controls our emotional responses, our memory, learning, visceral and autonomic functions, from within the limbic system.

The prefrontal cortex which controls decision-making and can override our emotional responses.

The hippocampus, which controls memory formation, contributes to cognitive and emotional processing, while intricately weaving together their functionalities.

Peptides (hormones and neurotransmitters) manage the biochemical overcontrol of our emotions and play a crucial role in assisting the activities of our immune system, by integrating mental, emotional, biological activities and eventually our spiritual wellbeing. They color, predict, and change our behaviors, our moods, and our unique emotional tone. For example, the hormone ghrelin determines our hunger, insulin triggers a gain of body fat, incretin tells us we are full, and leptin responds to too much body fat. It is interesting to note that when we are obese ghrelin and insulin stay active but leptin activity drops. The balance of hormones and neurotransmitters influence our emotions and there are no hard-wired emotion control circuits in the brain. Our emotional responses are free will controllable, but that control is incremental. Patience, determination, and consistency are required to gradually change the neurotransmitters at each nerve synapse as they relay our emotional response signals. They are first established, and then they are modified by epigenetic methylation and our newly established emotional predisposition. (Ref 5, 56)

Recent research by Melissa Hogenboom (Ref 63) showed that mindfulness and meditation reduced the structure of the amygdala (which indicated less stress) and an increase in the size of the cingulate cortex (indicating improved emotional control).

The main neurotransmitters involved in emotional responses are:

Glutamate and Gamma-Aminobutyric acid (GABA) give us our balance of excitement versus the urge to be calm and ensures our homeostasis. It is improved with drugs such as Lithium (with devastating long term side effects) or with ketosis, and good sleep.

Calcitonin relates to our fear.

Dopamine is the body's reward system, which includes feeling pleasure, achieving heightened arousal, and learning, unexpected benefit, motivation, and future happiness.

Norepinephrine, AKA noradrenaline, relates to our sympathetic nervous system alertness.

Opioid peptide (oxytocin) is involved in orgasm, social recognition, pair bonding, anxiety, group bias.

Epinephrine AKA adrenaline controls our fight or flight prep.

Serotonin (95% of which comes from the gut) controls our anxiety, current happiness, sense of wellbeing, appetite, mood, memory, and sleep.

Purines (adenosine) is a neuromodulator involved in suppressing arousal and improved sleep.

Endorphins relate to our current pleasure and self-esteem.

Neurotensin acts like dopamine but is more specifically for the differentiation of “good” from “bad” thoughts.

Our initial emotional conditions relate to our calmness, and our ability to handle new challenges which in turn relates to our trust in God.

Religious persons must not regard every vivid psychological presentiment and every intense emotional experience as a divine revelation or a spiritual communication. Genuine spiritual ecstasy is usually associated with great outward calmness and almost perfect emotional control. But true prophetic vision is a superpsychological presentiment. (91:7.3 (1000.4))



Emotional Relationships

Jesus taught the appeal to the emotions as the technique of arresting and focusing the intellectual attention. He designated the mind thus aroused and quickened as the gateway to the soul, where there resides that spiritual nature of man which must recognize truth and respond to the spiritual appeal of the gospel in order to afford the permanent results of true character transformations. 152:6:4 (1705.4)

Thought Processes

Some might visualize their thinking as a linear (male) process. Others may picture it as a plainer more matrix cross referencing (female) evolution of thoughts. Thinking may be more like volumetric sculpting, and the Thought Adjuster may be able to “see” the value as a sculpture that exists within the wholeness image of our thoughts, and it may be that manipulations of the time delays would give the Thought Adjuster the ability to mold the overall dynamic sculpture. To help, we might think of changing the lighting to be more of a top-down illumination or turning up the contrast to make the shape more cosmically recognizable. This might be done by “effortless attention” to thought precursors (continuous communion with God) and cooperating with the Thought Adjuster’s (fear not) efforts. Perhaps at times when repetitions are involved (such as in music) we can be more helpful since we have multiple chances at fine tuning that picturization. Practice with quieting the unnecessary clouding of sensory inputs from the body and minimizing non-valuable, higher frequency thoughts, may also help.

The Adjuster... is the higher and truly internal spiritual stimulus of thought in contrast with the external and physical stimulus, which reaches the mind over the nerve-energy mechanism of the material body. 108:6.4 (1193.3)

In a spiritual sense our curiosity about God consciousness and our willingness to be influenced (to share the inner life) may allow us to imagine the source of that illumination and to creatively extrapolate, from that mental spiritual safe zone, the realization of the resultant enduring peace.

Since this inner life of man is truly creative, there rests upon each person the responsibility of choosing as to whether this creativity shall be spontaneous and wholly haphazard or controlled, directed, and constructive. 111:4:9 (1220.8)

The attainment of cosmological levels of emotional equipoise, calmness, equanimity, and happiness may involve time delayed responses. It would be like *injecting a fragment of eternal timelessness* into our frenetic thinking. It can likely be encouraged by the “effortless attention” and “restful spiritual exertion” of worship. **143:7:7 (1616.9)**

Quantum coherence occurs when particles act in a coordinated manner, effectively behaving as a single quantum system. This coordinated behavior allows for phenomena like superconductivity and superfluidity. In subjective experiences, we may find a parallel to quantum coherence in certain mental states, various mental processes align seamlessly, creating a sense of effortless action, heightened performance and a sudden down rush.

When the mental mobilization is absolutely total on any level of the psychic upreach toward spirit attainment, when there exists perfection of the human motivation of loyalties to the divine idea, then there very often occurs a sudden down-grasp of the indwelling spirit to synchronize with the

concentrated and consecrated purpose of the superconscious mind of the believing mortal. 100:5:4 (1099.2)

It may also be aided by a truly relaxed approach to:

- 1. Curiosity - Hunger for harmony and thirst for beauty. Persistent attempts to discover new levels of harmonious cosmic relationships. The satisfaction associated with satiated curiosity.**
- 2. Aesthetic appreciation - Love of the beautiful and ever-advancing appreciation of the artistic touch of all creative manifestations on all levels of reality. The calmness associated with being in beautiful surroundings.**
- 3. Ethic sensitivity - Through the realization of truth, the appreciation of beauty, which leads to the sense of the eternal fitness of those things which impinge upon the recognition of divine goodness in Deity relations with all beings; and thus, even cosmology leads to the pursuit of divine reality values—to God-consciousness. 56:10.5 (646.6)**

All these lead to the emotional calmness of knowing that it is a friendly universe managed by a loving father. Perhaps this is like the emotional calmness felt by Andon and Fonta after discovering how to make fire or their first worship experience.

Human experience is an interplay between an active and questioning personality and is equal to depth of a concept plus the recognition of its reality. This creative self-consciousness experience is driven by sensory discovery and the expectant imagination of related things, minds, meanings and spiritual values. 102:4.2 (1123.2)

Sentience and God Consciousness

Let's look at the bodily functions that help our mind to calmly relate to God as creator, controller, and upholder. It is possible that time delays, combined with quantum coherence, and these other physiological enhancements, are proportional to our degree of sentience, our self-consciousness, and God-consciousness.

In the mortal experience the human intellect resides in the rhythmic pulsations of the adjutant mind-spirits and effects its decisions within the arena produced by encirclement within this ministry. 117:5:7 (1286.5)

Intuition (instinct), understanding (rationalization), courage (loyalty), knowledge (ideology), counsel (socialization), worship (zeal), wisdom (symmetry) may be related to patterning and cross communication of brain cells. The functioning of the adjutants would then be related to microtubule lengths, their associated time delays, (Ref 61) and their MAP patterning in the brain. Microtubules don't function until there is dissipationless electrical energy transfer (insulation from surrounding tissue) and this is critical for allowing quantum coherence. This only occurs when microtubules are suitably insulated and are greater than 10^{-6} m in length. Is this the initial condition needed for the adjutants of worship and wisdom? Is microtubule length also related to the universal receptivity of the Spirit of Truth after Pentecost?

The Spirit of Truth may function to provide a bias superimposed on the overall patterning of these microtubules and their associated ARC propagation time delays. This patterning may also be a general electrical bias overlaid in the white matter surrounding the brain, together with the patterning of the microtubules themselves as influenced by the flow of ARC activity. These patterns might be **“the living way from finite consciousness**

to transcendence of consciousness” (117:3:3 & 7:7.4 & 52:5:4 & 101:3:3). This patterning may allow for the functioning of the Spirit of Truth and this patterning may have been derived from *the patterning of Michael’s own microtubule structures* as he arranged them, in his own brain and body, 2000 years ago.

On Urantia the establishment of this “new and living way” was a matter of fact as well as of truth. 52:5:5 (596.3)

Our biases result from the lengths of the tubules and established trigger voltage thresholds which are constantly changing. The fact that we can influence the lengths of these microtubules in these para crystalline-like structures, and our calmness (think base voltages versus trigger voltages) suggests that over time, we can develop “habits of thinking” (patterning our thoughts the way Jesus did). The stable patterns of these cascade phenomena may become our **“religious habits of thinking” and our “conditioned spiritual reflex” 100:1.8 (1095.3) 160:3.2 (1777.3)** and since we become more like the one we worship, **(5:5:14 & 133:4:9)** this may be the basis for our soul growth and stabilization of purpose.

One final thought on the Spirit of Truth. Could it be that the Spirit of Truth is the third uplift, the first being the organizational uplift of the planetary prince, the second being the biological uplift by Adam and Eve? Perhaps the planetary prince gave us ideas on how to organize ourselves? Perhaps Adam and Eve gave us their DNA uplift which included microtubule enhancement? Could it be that during Michael’s incarnation he learned how to manage his own emotional control, biological processes and microtubule thought patterning? Did he learn how material bodies function and how best to fine tune their physiological functions for improved spirit reception? Did he learn the patterns of neurotransmitters and neurotubule lengths best suited for the universal reception of Thought Adjusters and increased spiritual influence? Can we religiously manage our own reaction patterns and emotional responses to life’s situations?

Of all human knowledge, that which is of greatest value is to know the religious life of Jesus and how he lived it.” 196:1:3 (2090.4)

Top-Down and Bottom-Up Interpretation

Spiritually, **“creator consciousness seems to proceed from thought-value, through the word-meaning, to the fact of action.” 118:5.3 (1299.3)** From our bottom-up perspective, our progress seems to proceed from facts to thoughts, to meanings and then to the value of those meanings.

Materially, this perspective might be thought of as organizing electrical energy, volitionally as we use our free will to control our thoughts and organize them to be receptive to spirit energy symmetry. Our task may be to harmonize these two reciprocal perspectives.

Scientific, moral and spiritual insights are the self-consciousness of reflective thinking and make it possible for man to function as a rational and self-conscious personality in science, philosophy, and religion 16:6:9 (192.5) (think three cosmic intuitions).

Matter-energy is the mathematical logic of his senses; mind-reason knows their moral duty; spirit-faith (worship) is his spiritual experience. These three intuitions, if unified by patterning their relationships, produce a strong combination of factual science, moral philosophy, and religious experience that validates our experience with things, meanings, and values. 16:6:10 (192.6) (think cosmic circle attainment).

It seems to me that cosmic circle attainment involves material (think epigenetics), intellectual (think emotion) and spiritual (think faith trust) progress. Education may sharpen and unify these patterns of thought processing in our mind. Civilization may express these meanings and values; life may experience them, and religion may ennoble them. There is a calmness associated with the realization of their inevitable perfection. During our formative years we are functioning primarily at the animal (fear your enemy) survival level. Once we have confidence in an afterlife and God's plan, our task becomes to invert this bottom-up, survival of the fittest, mentality to a top-down love our enemy, cosmic perspective. This may require that we gradually, over time, change our thinking and entrench the Jesus inverted ways of thinking. I call this the Jesus flip (think, beatitudes, inevitabilities, selflessness).

I say to you: Love your enemies, do good to those who hate you, bless those who curse you, and pray for those who spitefully use you. 140:3.15 (1571.2)

Soul Physiology

It seems to me that there are two fundamentals that need to be captured to transfer our soul identity to the resurrection halls to begin up there where we leave off down here. We will need our memories. The Thought Adjuster might have a spiritual replica of the salvageable thought pictures from our experiences and reactions. The values of these past experiences and their associated memories are in the safe custody of our Thought Adjuster. We will also need our characteristic physical traits. What might be a mechanism to capture, at any instant, our mental patterns, material status and possibly a snapshot of our mid-mind, for transfer/transition to mansion world number one? Our guardian angel may be aware of our DNA, with its epigenetic tagging and other modifications, as well as our microtubule lengths and light patterning representing the combined spiritual/physical status of our body, brain, and nervous system. At death (or any suitable time before death) a snapshot of this information, could be reduced to a numeric sequence, essentially a digital or analog representation of our luminosity.

...the seraphic guardian eventually becomes the personal custodian of the mind patterns, memory formulas, and soul realities of the mortal survivor during that interval between physical death and morontia resurrection. 113:3.4 (1244.5)

...your records, identity specifications, and the morontia entity of the human soul—conjointly evolved by the ministry of mortal mind and the divine Adjuster—are faithfully conserved by the destiny guardian together with all other values related to your future existence, everything that constitutes you, the real you... 113:6.1 (1246.5)

These phases and forms of soul, these once kinetic but now static formulas of identity, are essential to repersonalization on the morontia worlds; and it is the reunion of the Adjuster and the soul that reassembles the surviving personality, that reconsciousizes you at the time of the morontia awakening. 112:3:5 (1230.3)

A fully grown human adult might have between 80–100 trillion cells. About 4 trillion of them do not have our own genetic material so we are not so concerned with them, but what about the information, relationships, and intercommunication patterns that the DNA modified cells have developed over our lifetime? Are they preserved and if so, how?

The second law of quantum complexity says that complexity, like entropy, always increases up to a local or global maximum. We are living in a locally and globally entangled reality. This is demonstrated by the life after heat death, of a black hole where even after thermal equilibrium (heat death) complexity increases due to quantum entanglement. The investigation of possible states takes longer than the time to get to thermal equilibrium. This is analogous to computer circuit complexity in a physical system. It is like a reverse cypher code (the code required to break a cypher). It implies that after material death (material heat death), the soul could continue its search for complexity.

Light has momentum and momentum is a vector. The so called ‘‘Poynting’’ vector. i.e. it has magnitude and direction. In four-dimensional Minkowski relativistic space, the equation is $E^2 = p^2c^2 + m^2c^2$ (where E = energy, p = the magnitude of momentum, m = mass, c = speed of light in a vacuum) or more simply $E = pc$. The concept of momentum transcends Newtonian mechanics. Momentum is a fundamental property that is conserved in all physical systems with *spatial* translational symmetry according to Noether's theorem (Ref 97). Similarly, energy is a fundamental property that must be conserved in all physical systems with *time* translational symmetry. This implies that our biological luminescence and its associated patterns can have magnitude and direction, momentum Godward, momentum godward after disassociation from our spatial patterned matter. This may be facilitated by our faith association of the source of our energies, the Third Source and Center and our directing of those energies, towards God the Father.

Another factor to consider is the matter of collocation. Matter at the subatomic level is made up of fermions and bosons with mass, and photons with no mass. It is interesting to note that all Bosons start with no mass but because most can interact electrically with the Higgs field all, except the photons, gain mass. No two fermions can occupy the same space or quantum state simultaneously (think fatherlike), but multiple massless bosons, gluons, (the particles that mediate the strong nuclear force) photons, and the Higgs boson (the so-called God particles) *can* (think motherlike). Michael and mass are both spatially specific (they have ubiety), and our local universe mother spirit (and photons) can simultaneously be in multiple places at once, (they are ubiquitous). This also hints at the complemental and coherent nature of matter and spirit.

It is also interesting to note that gluons, the smallest particles that have velocity and direction, are massless bosons. They facilitate the strong interactive force that hold the quarks together that make up the protons and neutrons. On the other extreme we have massless photons going anywhere both extremes are functioning outside of time. (Ref 118)

					<p>Quarks</p> <p>Leptons</p> <p>Anti-Quarks</p> <p>Anti-Leptons</p> <p>Bosons</p>
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Fermions (top4) and Bosons (bottom line)

There are 12 different bosons (force carriers) and they are grouped to describe their three interactions.

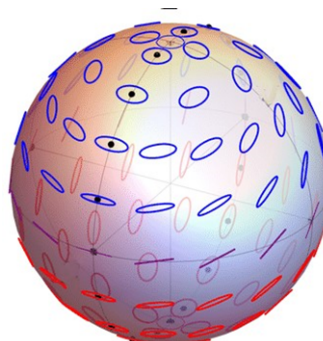
1. The 8 gluons mediate the strong nuclear force, and act only on particles with a color charge: the quarks, antiquarks, and other gluons.
2. The 3 weak bosons, the W^+ , W^- , and Z^0 , are all massive and mediate the weak nuclear force. If you can radioactively decay or be a product of radioactive decay (including all fermions), these bosons can interact materially with you.
3. Photon γ has no mass and yet is responsible for mediating the entire electromagnetic force spectrum. All charged particles experience electromagnetic interactions, including fermions, except for the low-mass, uncharged neutrinos and antineutrinos that barely interact with anything at all (think solitary messengers). Light can change its direction because it has momentum. This change of momentum results in a force.

It is interesting to note that fermions have a “color charge” which is **triune** in nature (think trinity, paradise triata material) with color combinations (e.g. red, green, and blue for quarks, and cyan, magenta, and yellow for the antiquarks). Fermions are the basic parts of protons and neutrons that make up the nucleus of atoms and respond to magnetic fields. i.e. demonstrate a cosmological alignment tendency. The bosons however are **dualistic** (think male female, right wrong, God’s will or not) and have only varying degrees of positive or negative charge.

In the central universe these physical systems are threefold organizations known as triata. They are the superpower mother systems of the creations of time and space. 11:8.7 (126.3)

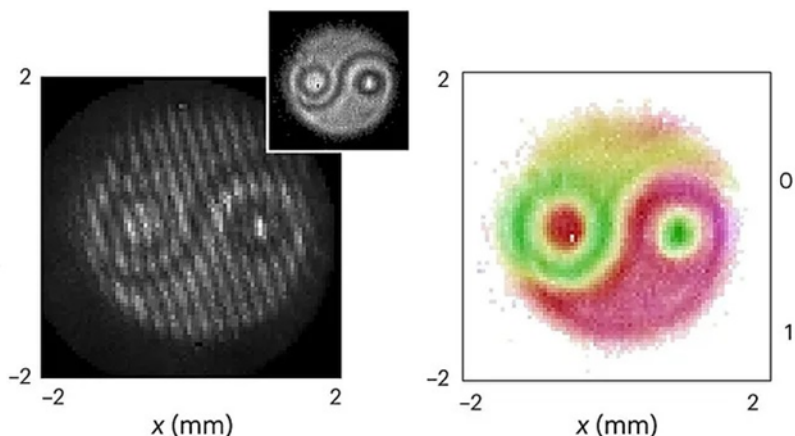
Side note: Chris Watson’s *Entropy Scale Factor* (ESF) theory published in *Reports in Advances of Physical Sciences* on July 19, 2023. Said there is no need for dark matter if we use entropy (total information, order vs chaos) to describe gravity. (Ref 66)

When thinking of photons, although they are particles, try not to think of them as little balls. They are small, spherical ripples in the electromagnetic (wave influenced) continuum that we (UB 42:5.14 (475.10) and Ref 100) call particles. These ripples or blobs radiate spherically in three-dimensional (time bound) space. If the photons came from the same source (say the bioluminescence of a microtubule), they are “entangled”. When you “detect” (like in the rods and cones of the eye) you not only extract the energy (flatten the bump) by that detection, but you also affect the entire wave, so this energy extraction could be observed at the other locations around the spherical wave pattern (think reflectivity). Studies investigating the preservation of photon entanglement in polarization after one entangled photon propagates through brain tissue, indicates that the non-local correlations between photons are maintained even through complex biological tissues. (Ref 87) This is particularly poignant in the case of microtubules because of their qubit computational functionality and their magnetic field sensitivity.



Poincaré sphere visualization of entangled photon states

Thinking more on the eternal aspect of photons, this means that the degrees of freedoms of the photon, do not change with time. Microtubules emit bioluminescent photons at specific resonant frequencies in the infra-red and ultraviolet ranges and this luminescence is representative of the way we think and react to external stimulations. Photons are pure energy, have no mass and yet have momentum and photons are eternal. Photons are particles that can be influenced by the whole as demonstrated by their wavelike properties. It is possible that their light patterns (influenced by our reactions to the whole), once emitted, could be captured and might even continue after our physical mass comes to rest. It is possible that our guardian angel could detect this light pattern information, and relay it to mansion world number one while at the same time the numeric representation of our luminescent energy could be memorized (like taking a picture) and relaying the image, for initial patterning of our morontia body to “... **begin over there right where you leave off down here.**” 47:3:7 (533.5) It may also be that there is an intermediate (pre morontia) state of the soul made up of the intermediate class of particles called hadrons that are composite particles of bosons and fermions. The word hadron comes from the Greek word “stout” or “thick” because they are analogous to molecules in that they respond to the electric force and make up our protons and neutrons. Remember how the nuclei of atoms respond to cosmic magnetic alignment? This nuclear electromagnetic alignment might have a super additive influence on our microtubule bioluminescence.



Reconstruction of a holographic image of two entangled photons
 (Image credit: Nature Photonics, Zia et al.)

Experiential Soul Fusion

What does it mean to experience a complete alignment, a bottom to top, fear to faith, material to spiritual, self to selfless, me to we, 180-degree (Jesus) flip?

What is human experience? It is simply any interplay between an active and questioning self and any other active and external reality. The mass of experience is determined by depth of concept plus totality of recognition of the reality of the external. The motion of experience equals the force of expectant imagination plus the keenness of the sensory discovery of the external qualities of contacted reality. The fact of experience is found in self-consciousness plus other-existences—other-thingness, other-mindness, and other-spiritness. 102:4.2 (1123.2)

Our free will creative control of all our experiences may be in the quantum neuron limbic cerebral feedback loop of our consciousness, and perhaps our superconsciousness, where we *objectively* (materially) and

subjectively (spiritually) experience the phenomenon of aspiring to be at peace and eventually, to be Godlike. Our free will control may allow spirit dominance to align our neuronic activity to the Thought Adjuster's preferred path, a fusion of paths. A fusion of purposes. A fusion of minds.

... the phenomenon of the making of these two minds one...129:4:2 (1425.1)

And if this choice is made, sooner or later will the God-choosing son find inner union (fusion) with the indwelling God fragment, while this same perfecting son will find supreme personality satisfaction in the worship communion of the personality of man and the personality of his Maker, two personalities whose creative attributes have eternally joined in self-willed mutuality of expression—the birth of another eternal partnership of the will of man and the will of God. 111:5:6 (1221.7)

What is this “inner union,” fusion of wills? In the physical world nuclear fusion occurs when the electromagnetic energies of two atoms get close enough to be retained by their uniting weak force releasing the extra energies that are no longer required. It takes energy to slow down fundamental energy to the electron level and the “life flash” of fusion **55:2:4 (623.4)** may be the release of the extra energies that are no longer required.

It is conceivable that fusion with our Thought Adjuster may be like this phenomenon, wherein patterning of our neuronal material electro-chemical energies get close enough to the patterning of the morontial-spiritual energies of our Thought Adjuster to be retained by this God fragment. If the Thought Adjuster's spiritual energy runs in similar paths as our material energies, these harmonized electro-chemical neural energies might get close enough (in the soul) to combine with our morontial energy, and both would fuse with the immediate release of the excess energy required to create coherent vibrational energy in “**Chariots of fire**”.

Philosophy of the Physiology of Spiritual Influences

Just as there are two kinds of time, there are two philosophical perspectives for our approach to God. We can identify with the physical body and its material environment, or we can think from a soul base and its cosmic reality. We tend to use our external reality to evaluate our physiological progress and our philosophy, with its ability to sense cosmic influences to gauge our spiritual progress, but our true progress is in our superconscious soul mind, where our creative Thought Adjuster influence helps to transfer our identification with and attachment to, our spirit core.

But mortal personality, through its own choosing, possesses the power of transferring its seat of identity from the passing material-intellect system to the higher morontia-soul system ... 112:5:4 (1232.5)

The processes we have investigated are akin to applying the scientific method to our spiritual, external, and hopefully our internal philosophical progress, and this can be viewed from at least three additional perspectives:

1. Discovery of facts as extrapolation of currently known facts.
2. Developing new techniques in ourselves.
3. Observing changes in ourselves during our investigations.

These processes may be integrated, and their individual strengths will then be a function of our different experiences and their memories. Each of these growth mechanisms will build on these new experiences as we move forward and integrate them internally.

In the inner experience of man, mind is joined to matter. Such material-linked minds cannot survive mortal death. The technique of survival is embraced in those adjustments of the human will and those transformations in the mortal mind whereby such a God-conscious intellect gradually becomes spirit taught and eventually spirit led. This evolution of the human mind from matter association to spirit union results in the transmutation of the potentially spirit phases of the mortal mind into the morontia realities of the immortal soul. Mortal mind subservient to matter is destined to become increasingly material and consequently to suffer eventual personality extinction; mind yielded to spirit is destined to become increasingly spiritual and ultimately to achieve oneness with the surviving and guiding divine spirit and in this way to attain survival and eternity of personality existence. 1:3.7 (26.1)

There is also an evolutionary physiology of spiritual influences. By thinking about God and the service of man, and because of previously practiced familiarity with the developing idioms of cognitive neurobiology, we can learn to discriminate by introspection, the coding vectors in our internal axonal pathways, the activation patterns across salient neural populations, and their relationships to enhance our God likeness. This kind of thinking is called Transcendent Naturalism and has a circular cause/causality paradigm that can be broken down like this:

1. Matter/Energy

There is a continuum between the quantum realm and the realm of classical physics when more complex forms of matter abruptly lose their quantum properties in a phenomenon called “decoherence.” Quantum properties like entanglement suddenly disappear, waveform collapses, and matter becomes measurable. Classical matter has emerged from the quantum realm via this constantly occurring decoherence. This implies that energy/matter has an emergent foundation and a coherent destiny.

2. Life. Sentient Autopoiesis

There is a circular pattern when something maintains and renews itself by regulating its own composition and conserves its own boundaries in a system of feedback loops.

3. Mind.

There are mechanisms involving things like microtubules and other connection relationships that form the base of a 4E (“embodied, embedded, enacted, and extended) cognitive feedback loop. As we enhance the positive aspects of these feedback loops, we improve our spiritual receptivity.

4. Culture.

Righteous minds try to ground morality in six innate, cross-cultural moral dimensions: care/harm, fairness/cheating, loyalty/betrayal, authority/subversion, sanctity/degradation and liberty/oppression. A moral culture is determined by the point in each dimension where actions become immoral. In other words, a moral system is defined by the ‘weights’ we give across and within the dimensions to different behaviors or expressions. As the cultures evolve, more sophisticated models emerge, culminating in “wisdom” which grows out of the wisdom of the individual as it is guided by top-down insight. There is not necessarily a direct connection between how things seem and how they really are. We are mostly WEIRD (Western, Educated, Industrialized, Rich, and Democratic). We often mistake our self-reporting of how things seem, unless we use a top-down perspective.

Is transcendent naturalism making us wiser? What is wisdom anyway? A common wisdom model is based on several different elements: metacognition (thinking about thinking) declarative knowledge (knowing what you know and don't know), procedural knowledge (knowing how to do things), conditional knowledge (knowing when and how to use what you know) and moral aspirations (trying to be 'good'). Are we improving our thinking about our thinking? Are we sure about what we "know"? Are we aspiring to be more moral. Are we becoming more loving? Let's review what we have learned in this exploration.

Summary

When you listen to a story or a parable, your whole brain is emotionally and intellectually immersed in the story. Stories involve context, conflict and outcome. Perhaps, when approaching life, when watching our life story unfold, we may want to immerse ourselves in the bigger story. The story of our eternal perfecting career of becoming more God like.

In every living plant or animal cell, in every living organism — material or spiritual — there is an insatiable craving for the attainment of ever-increasing perfection... 65:6.2 (737.2)

Dopamine, neurotensin, microtubules, MAPS, ARCs, SAMs, DNA enhancers, epigenetics, the DMN and HPA axis, the vmPFC, electromagnetic and optical quantum coherences, the consciousness of our consciousness, our creative mental picturizations, lower frequency thought cross pollination, time consciousnesses, controlled emotional responses and super consciously patterned habits etc. are all striving for improvement, and they are all within our control. These processes are all subtle and incremental. They require effort, consistency, and faith (delayed gratification) that they will eventually work. (Ref 116)

Every decision you make either impedes or facilitates the function of the Adjuster; likewise do these very decisions determine your advancement in the circles of human achievement. It is true that the supremacy of a decision, its crisis relationship, has a great deal to do with its circle-making influence; nevertheless, numbers of decisions, frequent repetitions, persistent repetitions, are also essential to the habit-forming certainty of such reactions. 110:6.6 (1210.1)

... electrical and chemical reactions are predictable. But mind can profit from experience, can learn from reactive habits of behavior in response to repetition of stimuli. 65:6.8 (738.1)

The human personality is not merely a concomitant of time-and-space events; the human personality can also act as the cosmic cause of such events. 12:5.11 (135.10)

Do the patterns of our electro-chemical energies involve some of the physiologies that the Life Carriers used with Michael's guidance and Mother's energies to manage our brain-mind connections? Have we touched on some of their experiments here? Mystery remains, for a while longer while we discover Our Mother and her various physiologically ingenious ways of helping us find Father.

As a reality in human spiritual experience God is not a mystery. But when an attempt is made to make plain the realities of the spirit world to the physical minds of the material order, mystery appears: mysteries so subtle and so profound that only the faith-grasp of the God-knowing mortal can achieve the philosophic miracle of the recognition of the Infinite by the finite, the discernment of the eternal God by the evolving mortals of the material worlds of time and space. 1:4:7 (27.2)

Take Home Anchor Points:

Perhaps these one-liners will trigger your own ideas of how to materially, incrementally, improve any interactions with your spirit helpers.

1. The physical to psychological link is bidirectional.
2. Your body supports your mind. Care for the body may help.
3. Attitudes, thoughts, emotions, actions, and reactions change your electrochemistry and spirit receptivity.
4. Patience and openness to thoughtful, reflective, change, may help.
5. Child-like faith and trust in God but have adult like focus.
6. Creatively, leap from a stable, calm, confidence in God's plan.
7. Where your thoughts go, your energy flows.
8. Emotions make epigenetic modifications to your gene expression on an instant-by-instant basis.
9. Aligning your anticipations with a top down, eternal perspective may help.
10. Let Paradise be the stable reference source of your electromagnetic fields.
11. Let your Thought Adjuster be your stable time reference for your material motion.
12. Invert your consequential thinking patterns to those of Jesus.
13. Trying to be more aware of spirit time than material age may help.
14. Getting good deep sleep and worshiping often may help.
15. Be still, and know, that Mother's processes, guiding us to find Father, are unfolding as they should.

In the mortal life, paths of differential conduct are continually opening and closing, and during the times when choice is possible the human personality is constantly deciding between these many courses of action. Temporal volition is linked to time, and it must await the passing of time to find opportunity for expression. Spiritual volition has begun to taste liberation from the fetters of time, having achieved partial escape from time sequence, and that is because spiritual volition is self-identifying with the will of God. 118:6.6 (1300.2)

Descartes's famous saying "I think therefore I am." becomes:
"My thoughts improve my electro-chemical responses; therefore, I am, and I will be."

Epilog

Inputs influence your nerves, which influence your amygdala, which influences your hypothalamus, which influences the release of peptides, which influence emotional and physical responses, which influence future reactions to similar inputs either towards inner calm or chaos.

Be a positive influence.

Said differently:

Your thoughts guide your physiology.
Your physiology guides your reactions.
Your reactions guide your character.
Your character guides your values.
Your values guide your intent.

Your intent guides **your thoughts**.

Let **your thoughts** be Adjuster guided.

Thank you.

Any thoughts or are you still looking for that “philosophic miracle” to makes sense of all this?

Glossary:

Activity regulated cytoskeletal memory reinforcing peptides (ARCS):

- Peptides that function in an mRNA like process that lays down memory tracks and sets up the ways we process thoughts.
- Responsible for creating our "... preconceived opinions, settled ideas, and long-standing prejudices."

Brain Waves:

- An electrical signal generated by a single neuron or a group of neurons sending signal(s) to another neuron or groups of neurons.

Coherence:

- Systematic or logical connections or the integration of diverse elements, or relationships giving rise to a sense of values.

Consciousness of our consciousness:

- Thought, realization of the thought, and reflection of the consequences of that thought.
- May also be the superconsciousness and/or soul consciousness of our wakeful consciousness.

Controlled emotional responses:

- Feelingly experiencing, without allowing emotions to hijack our intentions. The ability over time to "rewire the brain" or change the preferred electrical pathways.

Creative picturization:

- True creativity can happen in the mind since it circumvents antecedent causation.

Cytoskeleton:

- The network of protein filaments and microtubules in the cytoplasm (the material or protoplasm within a living cell, excluding the nucleus) that controls cell shape, maintains intracellular organization, communication and is involved in cell movement.

DNA enhancers:

- Genetically inherited and epigenetically controlled gene folding that supports higher level thinking.
- 4000 are specific to humans.

Electromagnetic quantum coherences:

- May influence "random" electromagnetic interactions and motions.
- Implies that random motion is controllable by such things as, Cosmic over control, Thought Adjusters, mind adjutants, the Unqualified Absolute or the Supreme.
- Shares "the part and the whole" functionality. E.g., Individual/Supreme, material/spiritual, experiential/existential.
- Demonstrates coherence with Paradise.

Epigenetics:

- The study of controllable changes in gene function that do not involve changes in DNA sequence.

Epigenetic gene manipulations:

- Modifications to DNA that influence gene folding and the resultant protein shape and function.
- Influenced by our emotions, focus and repetitions.

Homeostasis:

- A relatively stable state of equilibrium or a tendency toward such a state between the different but interdependent elements or groups of elements of an organism, population, or group.

Microtubules:

- Hollow tubes that connect and communicate between cells.

- Lengths increase and decrease as a function of cellular interactions.
- Lengths are proportional to the time delays between reactions and responses.
- They can only exist if they are hollow, electrically cored, and isolated.
- Can be influenced by quantum coherence.
- Resonances are in the mechanical, far infrared (bond stretch), and UV (electron jump) ranges.
- The two optical ranges may relate to where “delicately touch” our morontial selves.

Microtubule-associated proteins (MAPS):

- Proteins that cross connect microtubules.
- Reinforced by repetitions of thinking patterns.
- Substitutes for cross communication that resulted from myelin sheaths.

Neurotransmitters:

- Chemical messengers that are made up of small amine (triangular pyramid, with the nitrogen atom at the apex) molecules, amino acids, or neuropeptides.

Peptides:

- A compound consisting of two or more amino acids linked in a chain, the carboxyl group of each acid being joined to the amino group of the next by a bond of the type -OC-NH. They are the building blocks of proteins.

Quantum:

- A discrete quantity of energy proportional in magnitude to the frequency of the radiation it represents.

Slower lower frequency cross pollination:

- Taking time to consider the social, cosmic, and eternal ramifications of thoughts.
- Equivalent to the injection of a fragment of infinity into temporality.

Super consciously patterned habits of thinking:

- Learning to use Spirit of Truth (mind of Jesus) like thinking.

Synaptic Adhesion Molecules (SAMs):

- SAMs are peptide memory glue.

Bold quotes are from *The Urantia Book*.

Definition of terms from The Urantia Book: <https://www.urantia.org/urantia-book/read-urantia-book-online>

Adjutant Mind – a level of consciousness limited to animal functioning in 7 variants (5 animal and 2 human).

Andon and Fonta – First humans.

Conjoint Actor - God of mind, combination of God the Father and God the Eternal Son.

Cosmic mind – a level of consciousness that makes us more aware of our part in the whole.

First Source and Center – God

Fusion – Combination of our energies with the indwelling God fragment, Thought Adjuster.

Isle of Paradise – Material center of the known universe.

Life Carriers – Biological engineers involved with our material assembly.

Mansonia One – First heavenly world.

Michael – Jesus

Morontia – Energy existing between the material and spiritual levels.

Mother – Ubiquitous nature of God.

Personality – Our unchangeable uniqueness as an individual.

Soul – a mechanism for salvaging the best of your experiences.

Spirit of Truth – Greater deity awareness made available on Pentecost by Jesus.

Thought Adjuster – a spirit fragment of God (spirit spark) in you.

Thought changer until about age 25, Thought controller after about age 40.

Ultimaton – Subunit of an electron.

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Foot Notes

Foot Note: Schroedinger, in his 1944 Book “What is life”, argued that certain aspects of living organisms, such as both us and mutations (changes in the DNA sequence of a cell’s genome or a virus), might not be explainable by classical physics but required quantum concepts, for instance quantum leaps.

Foot Note: H. Fröhlich suggested in 1950 that macroscopic quantum coherent phenomena may be responsible for dissipation-free energy and signal transfer in biological systems through coherent excitations in the microwave region of the spectrum due to nonlinear couplings of biomolecular dipoles.

Foot Note: A.S. Davydov, proposed that solitonic excitation states may be responsible for dissipation-free energy transfer along the α -helix self-trapped amide in a fashion like superconductivity: there are two kinds of excitations in the α -helix: deformational oscillations in the α -helix lattice, giving rise to quantized excitations (“phonons”), and internal amide excitations. The resulting non-linear coupling between these two types of excitations is a Davydov soliton, which traps the vibrational energy of the α -helix and thus prevents its distortion (solitons are classical field theory configurations with finite energy).

Foot Note: S. Hameroff and R. Penrose, noted that one may view the tubulin protein dimer units of the microtubules as a quantum two-state system, in coherent superposition.

Foot Note: John Eccles proposed that each of the 40 million dendrons is linked with a mental unit, or "psychon", representing a unitary conscious experience. In willed actions and thought, psychons (Ref 42) act on dendrons and, for a moment, increase the probability of the firing of selected neurons through quantum tunneling effect in synaptic exocytosis, while in perception the reverse process takes place.

Foot Note: The subjective experience of intuition and sudden insight bears a striking resemblance to quantum tunneling. Just as a quantum particle can appear on the other side of an seemingly impassable barrier, the human mind can make intuitive leaps that bypass logical steps, arriving at solutions or ideas that seem to come from nowhere. (Ref103)

Foot Note: Neoteny (the preservation of juvenile traits) may be part of the evolutionary civilizational process that encourages reversion to the “child-like mind”.

Foot Note: In 2013 researchers at the University of Michigan discovered that DMT is produced in the pineal gland in live rats. It is unstable, most active during REM sleep and disappears immediately upon death.

Related Morontia Material Quotes:

Truth is beautiful because it is both replete and symmetrical. When man searches for truth, he pursues the divinely real. ... so to combine and associate material and spiritual energies as to produce a hitherto nonexistent phase of universe reality— morontia substance and morontia mind one third morontial, fabricated of the liaison of spiritual and material energy but beyond the range of mortal vision....material growths have a characteristic green coloration, but the morontia equivalents of vegetative life have a violet or orchid tinge of varying hue and reflection....This Jerusem broadcast-receiving station is encircled by an enormous amphitheater, constructed of scintillating materials largely unknown on Urantia ... Pause to consider: Mansion number one is a very material sphere, presenting the early beginnings of the morontia regime ... You are mostly human on the first mansion world, just a mortal being minus a material body, a human mind housed in a morontia form—a material body of the morontia world but not a mortal house of flesh and blood ... While the basic morontia forms of life and matter are identical from the first mansion world to the last universe transition sphere, there is a functional progression which gradually extends from the material to the spiritual ... The early morontia life in the local systems is very much like that of your present material world, becoming less physical and more truly morontial on the constellation study worlds unique energy organization called morontia material ... The local universe consists of three degrees, or stages, of reality manifestation: matter, morontia, and spirit. ... morontia mind is a term signifying the substance and sum total of the co-operating minds of diversely material and spiritual natures ... The midway creatures have long denominated this evolving soul of man the mid-mind in contradistinction to the lower or material mind and the higher or cosmic mind. This mid-mind is really a morontia phenomenon since it exists in the realm between the material and the spiritual ... There is operative throughout all time and space and with regard to all reality of whatever nature an inexorable and impersonal law which is equivalent to the function of a cosmic providence.

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