The Spiritual Brain

Evolutionary Understanding and Revelatory Enlightenment

Marta A. Elders

The purpose of this paper is to examine our evolutionary understanding of the brain in light of revelatory information presented in *The Urantia Book.* We will pursue our study beginning with a brief description of the cosmological context, as revealed in *The Urantia Book,* in which evolution occurs. We will then consider the significance of this process, the intricate beauty of this plan, and the structure provided by higher order beings; while simultaneously exploring what we, as evolutionary creatures, have discovered. We will discuss the mechanics of the brain, examine the relationship between brain and mind, and explore how the brain, through consciousness, becomes a conduit to spirit. We will conclude with a brief overview of the present research that supports a relationship between spirituality and our living brains.

Revelatory Information

From *The Urantia Book* we know that we are citizens of a small planet, Urantia (earth), located in Nebadon (our local universe), and positioned in Orvonton (our super universe/the milky way galaxy). We are lovingly overseen and shepherded by our local universe Creator Son, Michael of Nebadon and his partner our Local Universe Creative Mother Spirit. They have accepted the responsibility to administer our local universe, and, through a creative, evolutionary process, to bring it to a state of perfection, that will simultaneously contribute to our God of time and space. Quite an undertaking. Just imagine the kind of preparation required. The enormity of the plan. What kind of strategy must be designed? How will this be initiated and maintained? *The Urantia Book* provides some insight into these questions by revealing the mechanism designed by the Life Carriers: the existence and evolution of the human brain.

Evolution is a divine design, masterfully constructed, initiated, and facilitated, through which perfection is realized in time and space. Evolution is primarily a

linear process that must initially, i.e. “begin at the beginning!” and meet the early planetary needs while being flexible enough to grow and transform over time in ways serviceable to the journey toward perfection. This creative ideal must be concretized in time and in space. This process must adapt to the requirements of the realms of matter, mind, and spirit.

We have been informed that 987,000,000,000 years ago a force organizer and inspector reported that conditions were favorable for the initial materialization process in this area of the Orvonton. Then, after receiving the appropriate permit 900,000,000,000 years ago, the process of actually inaugurating and organizing the energy was begun 875,000,000,000 years ago. The Power Directors came to this superuniverse to prepare the material environment so that the Creator Son could begin his time/space adventure in conjunction with his partner, the universe presence of the Infinite Spirit. They energetically readied the stage upon which the Creator Son would reality-ize his time/space potential in partnership with this universe presence of the Infinite Spirit, our Local Universe Mother Spirit. A Mighty Messenger tells us (32:2.1):

“From the energies of space, thus previously organized, Michael, your Creator Son, established the inhabited realms of the universe of Nebadon and ever since has been painstakingly devoted to their administration. From pre-existent energy these divine Sons materialize visible matter, project living creatures, and with the co-operation of the universe presence of the Infinite Spirit, create a diverse retinue of spirit personalities. “

The first creative act of Michael and the universe presence of the Infinite Spirit brought the Bright and Morning Star, Gabriel, into existence. He serves as our local universe chief executive. Following his appearance a multitude of additional and diverse creatures and personalities were brought into existence. Among the early arrivers are the Life Carriers, the Father Melchizedek, and the orders of Melchizedeks. As the purpose of this study is to compare aspects of the divine design as revealed in *The Urantia Book* with our present neuropsychological understanding of the brain, we will focus on those beings tasked with the design,

development, and instigation of life specifically related to brain and mind.
In preparation for the initiation of life on a material sphere the Life Carriers have wisely tested and selected dynamic techniques, providing a mechanism to further evolution. Because we happen to be a decimal planet, new creative possibilities may be tested and implemented during the evolutionary process in addition to these early preparations.

The Life Carriers, under the supervision of the Father Melchizedek were responsible for designing and developing a living instrument through which mind connects to the material realm. This relationship between mind and matter evolves in such a way that human mind develops, personality is bestowed, consciousness appears, free-will choices are made and spirit contact becomes possible. And what instrument did they design? A brain, a living brain. A Melchizedek comments (49:5.13) "*The one physical uniformity of mortals is the brain and nervous system."* While he goes on to describe various organizations of this mechanism (one, two, and three brained types), the reality that all mortals employ this mechanism, this living brain, in his or her planetary journey Godward is powerful. Clearly this evolving system is designed to serve the evolution of life on a planet from its earliest stages through the stages of light and life; from matter through mind to spirit.

The following quotes from *The Urantia Book* provide some insight into these arrangements:

"….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. "

"….. (And since the intellectual life grows out of, and upon the foundation of, the physical, there come into existence the four and twenty basic orders of psychic organization.) "

" Sphere Number Four and its tributary satellites are devoted to the study of the

evolution of creature life in general and to the evolutionary antecedents of any one life level in particular. ***The original life plasm of an evolutionary world must contain the full potential for all future developmental variations and for all subsequent evolutionary changes and modifications****…. there runs the thread of the wise and intelligent formulations of the original designers of the planetary life plan and species scheme. The manifold by-products of biologic evolution are all essential to the final and full function of the higher intelligent forms of life, …" (emphasis mine)*

"Number Five World is concerned wholly with life associated with mind. Each of its satellites is devoted to the study of a single phase of creature mind correlated with creature life. Mind such as man comprehends is an endowment of the seven adjutant mind-spirits superimposed on the nonteachable or mechanical levels of mind by the agencies of the Infinite Spirit. The life patterns are variously responsive to these adjutants and to the different spirit ministries operating throughout the universes of time and space. The capacity of material creatures to effect spirit response is entirely dependent on the associated mind endowment, which, in turn, has directionized the course of the biologic evolution of these same mortal creatures." (36:2.15-18)

And regarding how a neural circuit will operate in the material realm a Divine Counselor declares:

"…Sensations travel inward over the neural paths; some are detained and responded to by the lower automatic spinal centers; others pass on to the less automatic but habit-trained centers of the lower brain, while the most important and vital incoming messages flash by these subordinate centers and are immediately registered in the highest levels of human consciousness." (7:3.4)

Later we are informed:

*"….****Henceforth, evolution will follow the growth of brains, not physical bulk, and the development of brains will characterize each succeeding epoch*** *of animal evolution and planetary progress. (60:2.14)" (emphasis mine)*

And as the brain grows, mind via the seven adjutant mind-circuits will connect:

"…. Throughout the long evolutionary development of planetary life, these tireless mind ministers had ever ***registered their increasing ability to contact with the successively expanding brain capacities*** *of the progressively superior animal creatures. "(Emphasis mine.)*

" At first only the spirit of intuition could function in the instinctive and reflex behavior of the primordial animal life. With the differentiation of higher types, the spirit of understanding was able to endow such creatures with the gift of spontaneous association of ideas. Later on we observed the spirit of courage in operation; evolving animals really developed a crude form of protective self-consciousness. Subsequent to the appearance of the mammalian groups, we beheld the spirit of knowledge manifesting itself in increased measure. And the evolution of the higher mammals brought the function of the spirit of counsel, with the resulting growth of the herd instinct and the beginnings of primitive social development. (62:6.2-3)"

"…. the twins were about ten years old—when the spirit of worship made its first contact with the mind of the female twin and shortly thereafter with the male. We knew that something closely akin to ***human mind*** *was approaching culmination; and when, about a year later, they finally resolved, as a result of meditative thought and purposeful decision, to flee from home and journey north, then did the spirit of wisdom begin to function on Urantia and in these two now recognized human minds. "*

" There was an immediate and new order of mobilization of the seven adjutant mind-spirits… we knew we were upon the threshold of the realization of our protracted effort to ***evolve will creatures*** *on Urantia. (62:6.5-6)"*

Thus in summary a Life Carrier informs us:

"*BASIC evolutionary material life—premind life—is the formulation of the Master Physical Controllers and the life-impartation ministry of the Seven Master Spirits in conjunction with the active ministration of the ordained Life Carriers****. As a result of the co-ordinate function of this threefold creativity there develops organismal physical capacity for mind—material mechanisms for intelligent reaction to external environmental stimuli and, later on, to internal stimuli, influences taking origin in the organismal mind itself." (***65:0.1)

"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)" (Emphasis mine.)*

Much of this occurs between the material and mindal spheres until spirit reaches down:

"The adjutants function exclusively in the evolution of experiencing mind up to the level of the sixth phase, the spirit of worship. At this level there occurs that inevitable overlapping of ministry—the phenomenon of the higher reaching down to co-ordinate with the lower in anticipation of subsequent attainment of advanced levels of development. And still additional spirit ministry accompanies the action of the seventh and last adjutant, the spirit of wisdom. (65:7.7)"

These revelations give us some working knowledge of how our physical brain is meant to function in relation to the mind circuits of the universe and available spiritual ministry (the Spirit of Truth, the Holy Spirit, and the Thought Adjuster). So what have our scientists and neuroscientists discovered?

From this information in *The Urantia Book* one may conclude that the brain is the universal mechanism designed by Life Carriers to enable spirit reality to reach down into physical reality and evolve the life experience of human will creatures, commencing the self-conscious ascendant journey. Significantly, all evolutionary potentials for brain development are built into the life plasm delivered to a planet by the Life Carriers.

Evolutionary Understanding of the Brain

More has been discovered and understood about the brain in the last twenty years than in all preceding history. d'Aquili and Newberg in *The Mystical Mind* define the brain as *"the substantive underlying part of human thought, experience, and emotions… the bodily organ that allows us to think, feel, and receive input from the external world. (p.21)"*. Our neuroscientists have determined that the brain consists of a neural system composed of three significant components, the brain stem, the limbic system, and a cerebral cortex, that contains two hemispheres, right and left. It is the most complex organ in our body, weighs about three pounds, and is composed of approximately 100 billion neurons with approximately 1.1 trillion cells. Each neuron receives about 5,000 connective synapses and receives signals from neurotransmitters inducing an axon to fire or not. The possible combinations of 100 billion neurons firing or not is 10 to the millionth power (compared to the number

of atoms in the universe is 10 to the 80th power). Stunning and incomprehensible.

Neurologists have recently realized that the brain is malleable, evolves over time, and is able to change and adapt to diverse and challenging situations. They refer to this as the brain's plasticity, a relatively new concept as in the past we viewed the brain as being fixed—not able to change and grow. Essentially the previous understanding was "you got what you were born with and there wasn't any more coming." However, this is not true. We now know the brain continues to grow and change. Schwartz and Begley share an interesting example of the brain's flexibility: if the left hemisphere is removed prior to the age of 4 or 5 a child can still be taught to read and write, functions that were previously considered to be available only with a left hemisphere (p.99).

Regarding the development of the embryonic brain we now understand that during the 14 days following fertilization a ball of cells fold in on itself and the cells on the outer surface begin to form a tube that will eventually be a spinal cord and brain. After three weeks the embryo starts to produce neurons and by birth it is estimated that 100 billion nerve cells have been created and all six cortical layers are present. The spinal cord and brain stem are functional and almost fully formed. At birth the somatosensory cortex is developed so that through sensory input it constructs a "map" of the body--head to toe. Shortly thereafter the motor regions, the parietal lobe, temporal lobe, and frontal lobe activate.

During the first year of life the sensorimotor cortex, the thalamus, the brain stem, and the cerebellum all develop. At eight or nine months there is activity in the frontal lobe and other association areas such that there can be social interaction and cognitive activity. The frontal lobe is where judgment, reason, attention, planning, language, etc. occur. During the first two years of life a child is mainly developing his or her right brain. With the development of language and the formation of explicit memory the left-brain becomes more active. The frontal lobe area continues to develop into the late teens and early twenties. Throughout this time the brain is

constantly growing new connections and pruning old unused networks. This growing/pruning process illuminates how environmental inputs can influence the young nervous system and ultimately establish circuits that will power the brain. The brain wires itself. Experience and environment tend to lay down the pathways. As Jeffrey Schwartz comments in *The Mind and the Brain:*

"Plasticity must be a response to experience after all, the only thing the brain can know and register about some perception is the pattern of neural activity it induces. This neural representation of the event somehow induces physical changes in the brain at the level of neurons and their synapses. These physical changes allow the representation of the event to be stored and subsequently recalled...the physical changes are the memory. (p.108)"

There is a second wave of synaptic sprouting, the emergence of new synapses, in the frontal, parietal, and temporal lobes that occurs just before puberty, usually occurring between 12 and 16 and continuing into the early twenties. This "sprouting" tends to start a bit earlier in females than males and impacts self-control, judgment, emotional regulation, organization, and planning revealing noticeable changes during late adolescence.

Realizing that the brain only knows an experience as a neural activity one cannot help but wonder about the formation and functioning of mind. Where does it come from? What is it? How does it operate? Where is it located? How does learning occur? Etc. Neurologists have begun to discern that the brain and the mind are different entities, but in meaningful relationship. Dan Siegel, in *Mindsight,* proposes a tri-part system composed of the brain, the mind, and relationships suggesting that each component contributes to and grows the other. This is an interesting conception in light of Schwartz and Begley's comment that the life we live shapes the brain we develop. What we are able to start seeing here, as revealed in *The Urantia Book* is the intricate wisdom and beauty that the Life Carriers built into to the entire process of the origination and development of the brain.

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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)"

Evolutionary neuroscience has not, and maybe cannot without revelatory information, been able to realize and appreciate how mind functions and evolves on this planet. Nevertheless our scientists are perceiving the compelling differences between the mind and brain, and the interactions between the two. One can imagine how informative and freeing that knowledge of the intelligence ministry circuit on our planet-- the seven adjutant mind-spirits (intuition, understanding, courage, knowledge, counsel, worship, and wisdom) would be.

Interestingly Schwartz and Begley in *The Mind and the Brain,* comment:

"At its core, the new physics combined with the emerging neuroscience suggests that the natural world evolves through an interplay between two causal processes. The first includes the physical processes we are all familiar with—electricity streaming, gravity pulling. The second includes the contents of our consciousness, including volition. The importance of this second process cannot be overstated for it allows human thoughts to make a difference in the evolution of physical events (pp. 19-20)."

Evolution meets Revelation

Schwartz goes on to further state that there is emerging evidence that *"matter alone does not suffice to generate mind--…there exists a "mental force" not reducible to material." (p. 52).*

Our nervous system is composed of three main structures -the brain stem, the limbic system, and the cerebral cortex. These constructions reflect our evolutionary development over the past million years. The brain stem (reptilian brain) reveals our earliest survival strategies--the fight, flight, or freeze response. It is our most primitive component, connects to our autonomic nervous system (ANS), functions unconsciously, and assigns emotional valence to objects or contents.

The limbic system (the mammalian brain) is composed of the amygdala, hippocampus, hypothalamus, and thalamus. This system sits under the cerebral cortex and on top of the brain stem. These structures are involved in our emotional reactions and motivations -- anger, fear, curiosity, awe, hate, shame, love, rage, etc. The limbic system influences our short and long-term memories and our fear responses. These groups of structures have been vital to our survival. The amygdala sounds the alarm, the thalamus sends a wake up to the brain stem, the hypothalamus (primary regulator of the endocrine system) prompts the pituitary to signal the adrenal gland to release the needed stress hormones and the hippocampus regulates the emotional response and forms memory.

The third structure, the higher cerebral cortex (human brain), is what really differentiates us as humans. These two hemispheres are the source of our higher-level cognitive functions, our sensory abilities, and our motor control. The evolution of the neo-cortex is coincidental with the development of language, art, myth, culture, and society.

The living brain, as designed by the Life Carriers, has not only contributed to our survival from the earliest stages but also provided a vehicle for life experience, consciousness, personality bestowal, and will choice. It has also functioned as a mechanism supportive of mystical and spiritual experiences.

The Urantia Book reveals that the seven adjutant mind-spirits operate on the teachable level of material mind in three realms…one is the sub-human animal level that makes use of the first five adjutants; the second is the human intellect which employs all seven adjutants, and the third area is the super-human realm wherein an individual operates on the top two adjutants-- worship and wisdom. Regarding our neural system it is plausible that in sub-human/animal functioning one is using much of the limbic system and early pre-frontal. At the human level, the pre-frontal cortex is mainly used. Finally the superhuman level is most likely a soul mindedness.

A Divine Counselor informs us:

"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)"

And a member of the Life Carrier Corps adds:

"The physiologic equipment and the anatomic structure of all new orders of life are in response to the action of physical law, but the subsequent endowment of mind is a bestowal of the adjutant mind-spirits ***in accordance with innate brain capacity. Mind, while not a physical evolution, is wholly dependent on the brain capacity afforded by purely physical and evolutionary developments. (58:6.7) "(****Emphasis mine)*

Thus we can see that mind is dependent on brain capacity for its development whereas its evolution is also dependent on its ability to be spirit led.

Hanson and Mendius in *Buddha's Brain,* point out: *"When your mind changes, your brain changes, too."* (p.5) implying that mental activity creates new neural structures. Clearly this could be a dysfunctional process as well as functional. LeDoux in *Synaptic Self* infers that in the laying down of these neural pathways, our synaptic self, our brains "become" who we are and/or how we see and experience ourselves. As previously mentioned the life we live and the thoughts we frequent shape the brain we develop which in turn impacts the human mind we construct and the accessibility to the seven adjutant mind-spirits. To a degree the brain and human mind mutually evolve.

Tomaino comments in *Awakening the Brain* that one's consciousness grows with

each revelation that is received from another and each inspiration that is self-inspired. Given that mind impacts the brain, it can be inferred that the hardware, the brain, is also changed. Growth seems to be a reciprocal process occurring internally as well as externally.

We have been talking about mind, brain, and consciousness while possibly circling around a sense of the mystical or spiritual brain. What might that be in terms of neuroscience? d'Aquili and Newberg comment that the brain underlies all experiences of living human beings. It is a living transformer required for mind to function.

A Solitary Messenger tells us:

"The stoppage of life destroys the physical brain patterns for mind endowment, and the disruption of mind terminates mortal consciousness*. The consciousness of that creature cannot subsequently reappear until a cosmic situation has been arranged which will permit the same human personality again to function in relationship with living energy." (112:5.14)" (Emphasis mine.)*

This suggests that unique personal consciousness, as a facet of mind, is also temporarily terminated when the neural activity is disrupted. When the physical brain is destroyed clearly there is no transformer for the human mind to use and consciousness is unavailable.

The brilliance of the design of our living brain is astounding. We can observe how this living material structure through its own evolution has supported and furthered the evolution of human life and the planet. It is easily assumed, in light of the teachings available in *The Urantia Book that* the design embodies ways in which humans, through human mind, can open and ultimately move into and experience mystical and spiritual states. How might that occur? What is needed? How does the brain participate? What fires and where does the firing take place? How does the brain work with the mind? How does the mind use the brain? And what is our present understanding?

The Urantia Book implies that there must be electrical firing, i.e. vital pulsations for consciousness to be operative. We do know from various studies employing fMRIs, PET scans, SPECT scans etc. that brain activity can be recorded and measured. We now know that different sections of the brain respond to and electrochemically reflect different thoughts, feelings, perceptions, etc. So where are mystical experiences echoed in the brain? What areas seem to be activated or de-activated during these experiences? What about the interaction of our belief systems? What about our myths that support our narratives? What about the rituals we employ to sustain our myths? How do each and all of these relate to our brain system? Again, though previously mentioned, it is worth remembering: *"**the one physical uniformity of mortals is the brain and nervous system (49:5.13)."*** (Emphasis mine.)

When we ponder the reality that what "fires together wires together", we can appreciate the power of one's belief system and the establishment of correlated neural pathways. Our belief system is sustained by the myths we hold dear and those we identify with. Andrew Newberg in his 2012 course on The Spiritual Brain describes the brain as a myth-making machine. He considers this characteristic to be one of the significant aspects of this living organ. And while we understand that myths are a product of the mind, we also realize that it is via the neural firing in the brain that they can be supported and sustained.

A Mighty Messenger tells us:

"Partial, incomplete, and evolving intellects would be helpless in the master universe, would be unable to form the first rational thought pattern, ***were it not for the innate ability of all mind, high or low, to form a universe frame in which to think. If mind cannot fathom conclusions, if it cannot penetrate to true origins, then will such mind unfailingly postulate conclusions and invent origins that it may have a means of logical thought within the frame of these mind-created postulates.*** *And while such universe frames for creature thought are indispensable to rational intellectual operations, they are, without exception, erroneous to a greater or lesser*

degree. (115:1.1)" (emphasis mine)

We can see how our human minds use myth making to understand the world. It is how we make sense of who (we think) we are. It offers us possibilities and decision-making guidance. The myths provide a sense of morality, ethics, right and wrong, origin and destiny. We create our own narrative and we pass along earlier stories that we find meaningful, inspiring, and supportive of whom we want to be. Our religions are our myths of the day. They inform us, provide us with our belief systems, structure our ways of life, and offer a sense of purpose and destiny.

Our brain works with our mind to hard wire underlying dynamics and sustain stories about the world. We have always constructed myths. We have constructed them to explain the world and to make sense of what we cannot understand. We have created them to illuminate our journey. The powers of these stories connect us to the most essential parts of ourselves. The old myths, and perhaps new ones (look at Star Wars and Harry Potter), still embody psychological and spiritual truths that resonate with the psyches and the spirits of people today. We consider them classics as they continue to speak to us. Our mind will create a story that is coherent and meaningful even if it is not quite true. These tales frequently focus on existential concerns polarized by irreconcilable opposites (i.e. life and death, gods and humans, etc.). The myth reconciles these opposites and concerns are relieved. We are now "safe". We understand. We have meaning.

A Melchizedek tells us:

"The purpose of religion is not to satisfy curiosity about God but rather to afford intellectual constancy and philosophic security, to stabilize and enrich human living by blending the mortal with the divine, the partial with the perfect, man and God. It is through religious experience that man's concepts of ideality are endowed with reality." (101:10.5)

The myths, saved and passed on provide an orderliness to the world. They are passed on through legends; maintained and embellished through ritual. A ritual is often engaged to make the impact of the myth even stronger for a ritual will bring

the entire human body into the act. Thus the myth becomes embodied. This process lays down neural pathways in such a way as to both embody and maintain the structure of the myth. Rituals are visceral, emotional and cognitive. They concretize the myth through structured and patterned behaviors that are rhythmic and repetitive. These actions bind the story and reinforce the brain patterns. They synchronize the emotional, perceptual, cognitive, and motor processes within the central nervous system (CNS) of the individual attaching him or her to the story, and to many of the other participants as well. And while these protocols sustain the story, it makes it harder for an individual to embrace newer and higher ordered understanding once the earlier neural pathways are established.

Ritual is designed to bring one closer to a higher being. The rhythm of the ritual can stimulate brain activity in the limbic system (hypothalamus and thalamus), and decrease activity in the parietal lobe. It is in the parietal lobe where we seem to have a sense of self that is separate from the world and others. Our sense of time and space is reflected there as well. In entering the ritual one may experience a feeling of oneness or connectedness, and also paradoxically intense excitement and/or relaxation. Again one can appreciate the power and usefulness of developing ceremonies to maintain the belief system. Our beliefs frame our consciousness and awareness. The thoughts we keep thinking, we tend to actualize into reality. These convictions determine how we “see” things. They are the glasses we look through. They can be positive or negative and either way we tend to actualize them. A common understanding is that if you don’t believe it is possible, it will not happen. (Tomaino, p.12). And of course there is the “opposite” effect in terms of the placebo effect, such that if we believe it will happen it might. Rituals tend to heighten a situation, incorporating thoughts, feelings, and sensations which were/are fundamental in primitive healing techniques.

While we can appreciate the evolutionary contributions of beliefs and rituals and the bridge they provide, it is also important for us to maintain the revelatory awareness of their limitations. As a Melchizedek reminds us:

"Belief is always limiting and binding; faith is expanding and releasing. Belief fixates, faith liberates. But living religious faith is more than the association of noble beliefs; it is more than an exalted system of philosophy; it is a living experience concerned with spiritual meanings, divine ideals, and supreme values; it is God-knowing and man – serving. Beliefs may become group possessions, but faith must be personal. Theologic beliefs can be suggested to a group, but faith can rise up only in the heart of the individual religionist. (101:8.2)"

Many have reported spiritual and mystical experiences following participation in various rituals be they drumming, fasting, chanting, praying, meditating, dancing, etc. If we accept that the brain has neurologically supported many of our experiences, one wonders if, and how/where, it might allow and further these altered states.

Mystical experiences have several self-reported characteristics. They tend to be unitive, it "feels" real, and there is a sense of reality. Many comment the experience is indescribable and ineffable. It may seem paradoxical. The experience is outside of time and space. In the introduction to *The Mystical Mind* d'Aquili & Newberg (p.15) restate Frederick Streng's six types of religious/mystical experiences. One is the numinous experience of the holy. Another possibility is the transformative experience of reorientation. A third possibility suggests newfound courage at facing suffering and death. Another is a moral experience of obligation. The fifth type is an experience of order and creativity in the world—it all makes sense. And the sixth is a mystical experience of unity. A mystical experience is considered to be the process through which an individual might enter the realm of God or ultimate reality.

Neurotheology, theology from a neuropsychological perspective, is a study of the relationship between brain and spirituality that has been advanced by Andrew Newberg. Through this approach he explores how the mind/brain operate regarding an individual's relationship to God or to an ultimate reality. His theory hypothesizes that our brains embody a neurological mechanism that can support self-transcendence and open us to the spiritual realm. He comments that with neurotheology one can begin to

"understand the necessity for humans to structure myths, understand the brain mechanisms involved in their structuring, understand the need for ritual, and how it is generated by the brain, how it incarnates myth, its personal and social effects. Neurotheology can explain the need for and effect of ascetic practices and nature and consequences of meditation."(1999, p.12). "

Newberg proposes that we cannot understand religion without understanding mind and brain and that we are unable to understand the mind and the brain without understanding religion. In addition he refers to the mind as mystical, implying that it leads to a unified understanding of both science and religion.

A Melchizedek reveals:

"…Mind is unity; mortal consciousness lives on the mind level and perceives the universal realities through the eyes of the mind endowment. The mind perspective will not yield the existential unity of the source of reality, the First Source and Center, but it can and sometime will portray to man the experiential synthesis of energy, mind, and spirit in and as the Supreme Being. But mind can never succeed in this unification of the diversity of reality unless such mind is firmly aware of material things, intellectual meanings, and spiritual values; only in the harmony of the triunity of functional reality is there unity, and only in unity is there the personality satisfaction of the realization of cosmic constancy and consistency (102:2.5)."

Newberg comments in *Why God Won't Go Away* (p.145-146).

"….*mind remembers mystical experience with the same degree of clarity and sense of reality that it bestows upon memories of 'real' past events. The same cannot be said of hallucinations, delusions, or dreams. We believe this sense of realness strongly suggests that the accounts of the mystics are not indications of minds in disarray, but are the proper, predictable neurological result of a stable, coherent mind willing itself toward a higher spiritual plane*. "

Research

Much of the research regarding mystical and spiritual experiences has been self-report. With the advent of new neuroimaging techniques investigators have more sophisticated instruments with which to study these reported RSMEs (Religious, Spiritual, Mystical, Experiences). What is similar and what is different? How is it that the brain "allows" us to be spiritual? Is there a way for us to examine these

experiences neurologically? What occurs in the brain during and/or following a religious/mystical experience? Where is there significant firing and what is occurring in the brain during reported "quiet" states? What brain activity is noticeable during prayer? During deep meditation? Are the findings consistent over time and between participants?

Meditators have reported that during meditation they experience focused attention along with feelings of arousal or bliss. Simultaneously there is a decreased sense of self, accompanied by a sense of spacelessness and timelessness. Occasionally there is an eruption of ecstasy: an experience of unity. Those who have cultivated an active prayer life report similar sensibilities. Prayer may slightly differ as it may be more conversational, verbal, and defined by tradition in which case there might be additional brain activity.

In 1993 there was a study at University of Pennsylvania where cloistered Franciscan nuns who practiced centering prayer were examined with single photon emission computed tomography (SPECT) scans. The scientific data supported the self-reports and did reveal an increase in blood flow in the prefrontal cortex, inferior parietal lobes, and inferior frontal lobes. However, because this sample was small and the SPECT scans may result in blurred images the preferred neuroimaging technique at this time is the functional magnetic resonance imaging (fMRI).

A significant benefit of the fMRI is that it uses no radiation and one is able to obtain several images and observe several states. The fMRI measures blood flow across the brain. One major disadvantage is that one must be in the machinery which proved challenging for the nuns in the study. One major study looked at 15 Carmelite nuns and found that when they reported a mystical experience there was activity in the frontal cortex, the right temporal cortex, the right parietal lobe, the right caudate, the left insula, the left caudate, and the brain stem.

In another study beginner and experienced meditators were scanned while viewing

positive, negative, and neutral images, in mindful and non-mindful states of awareness. With the experienced meditators they found a decrease in the activity of the frontal and cingulate cortex across all emotional areas. For beginners there was a decrease in the left amygdala during the emotional processing.

We know from several studies that meditation changes the brain and that long-term mindfulness practices lead to emotional stability. It was found that meditation led to the cultivation of the positive emotions of empathy and compassion in response to emotional stimuli. Additional changes in the brain that were connected to meditation and prayer practices resulted in lower heart rates, lower blood pressure, an increase in serotonin, dopamine, and GABA, and a decrease in cortisol and norepinephrine. The practices affected emotional, behavioral, and cognitive components.

There is evidence that different neurotransmitters, specifically gamma-amino butyric acid (GABA) and glutamate, are involved in religious and spiritual experiences. The positron emission tomography (PET) and magnetic resonance (MR) scans have exposed their activity during reported meditative states. Results reveal an increase in the release of dopamine and GABA during yoga meditations, providing a sense of calmness and relaxation. GABA is a main inhibitor of the brain's neurotransmitters and may "shut down" certain areas of the brain resulting in a more focused state. On the other hand glutamate is a main excitatory neurotransmitter and may enhance feelings of euphoria.

The research has confirmed the health benefits from meditating. There is less anxiety, improved impulse control, and a greater sense of comfort. Meditation and contemplative practices have a have a lasting dramatic effect on the brain's functioning both during meditation and after. And as a result the brain mediates transformation.

What about other so called "altered states of consciousness"? They can be the result

of a drug-induced state such as LSD. They can be the result of an illness such as the delusions conveyed by a psychotic individual; or possibly temporal lobe epilepsy, which some have considered to be the cause of so called mystical experiences. Are these RSMEs? Or one's attempt to make sense of the brain's misfiring? When it is a mystical altered state the articulations of the individual usually relate to a sense of meaning and ultimate reality. If it's a drug induced state it is usually described by its intense sensory perceptions. And if it is related to a psychotic illness it is usually described as abnormal and dysfunctional. One wonders what happens to the brain during these times. Scientifically based, if seizure activity, one would conclude that the state is the result of the brain dysfunction and the experience is not real and not a spiritual experience. On the other hand if one explores it as a religiously based experience, one might conclude that the seizure has opened the individual to a truly mystical experience. Joan of Arc and St. Teresa of Avila fall into this category.

And how do we understand near death experiences (NDE)? Since they frequently occur at death, does that imply that mind, consciousness, or self continue? It would be interesting to explore the similar and different brain activities manifest during the different Stages of Faith delineated by James Fowler. Hopefully future research will look into these and other challenging experiences. Our ability to be able to shed light on mystical states from a neurophysiological understanding will be an important step in comprehending how the human brain is related to religious experiences.

Conclusion

It is encouraging to realize how our neurological understanding of the brain and the brain systems are moving toward what is revealed in *The Urantia Book*. Many scientists, witnessing the evolutionary process, now acknowledge the reality of both the brain and the mind, and the separation between them. Several scientists have posited a significant interaction and relationship between these two realities. While they do not have the revelatory information regarding the seven adjutant mind-spirits or can envision the ability of spirit to reach down through mind, guiding us Godward, they are noticing how mind develops the brain and how the increasing

access and use of parts of the brain may be "growing the mind". They now accept the plasticity of the brain and the ongoing growth possibilities. Neuroscientists are perceiving how religion, myth, ritual, meditation, prayer, etc. impact the neurological system in such a way that man is able to survive, move forward, and function in a meaningful manner. Researchers are mapping the areas of the brain that fire during these various states (meditation, prayer, ritual, etc.) in an attempt to understand how the brain as a living transformer participates in this process. Many of the investigators have noted that for many the RSMEs provide a sense of reality that remains with an individual and in some cases changes his or her entire life.

Clearly these spiritual experiences are complex, involve several areas of the brain and stimulate more questions and more possibilities for research. The scientists are questioning whether those who have these experiences are contacting a reality outside of themselves or not, and if so which brain structures are most active during those occurrences. Does the brain allow one to become closer to the real nature of the universe? Does the brain open to God? Or from our vantage point does the brain support the mindal circuits in supplying spiritual access? And some are asking: "Why do humans have a spiritual brain?"

A cautionary note here--for while *The Urantia Book* grants the usefulness of myth and ritual in our early evolutionary religions, it also speaks to the limitations of belief, ritual, and myth in our spiritual growth. It might be more appropriate to ask "Why do we have a brain through which spirit can reach down, make contact with material mind, and initiate our spiritual path?" And what are the "parts" of the brain that seem to be most active in that process? Why do we seem to be wired to believe, to create, to grow, and to speculate and/or find God or a spiritual reality? Fascinating questions and hopefully new research prospects.

Even from a higher (revealed) vantage point we can appreciate the commitment and understanding our human associates are demonstrating along this evolutionary path. Interestingly they are finding the way through mind to eventually realize the

interrelations between the realms of matter, mind, and spirit with the use of the living transformer—the brain.

We are truly blessed with the information available in *The Urantia Book.* We know that evolution is a divine plan executed, overseen, and facilitated by higher order beings. We know the process is purposeful. We are witnessing its actualization in time and space. We know it is a journey Godward. What's compelling is how, billions of years ago, the life carriers in their labs were able to develop a life plasm and a living organ through which all of this could occur over time. It is awesome to contemplate the fact that this early life plasm, designed, created, and implanted on our planet contained the potential for the emergence of the brain and neural system from the very beginning. And that it will continue to serve the universal purpose until we are at least settled in light and life. The human brain and nervous system is the one physical uniformity, in the universe of Nebadon. Truly stunning.
We know that:
.*Material mind is the arena in which human personalities live, are self-conscious, make decisions, choose God or forsake him, eternalize or destroy themselves. (111:1.3)*

And that: material mind requires a living mechanism, the brain, in order to function.

And that:

Material evolution has provided you a life machine, your body; the Father himself has endowed you with the purest spirit reality known in the universe, your Thought Adjuster. But into your hands, subject to your own decisions, has been given mind, and it is by mind that you live or die. It is within this mind and with this mind that you make those moral decisions which enable you to achieve Adjusterlikeness, and that is Godlikeness. (111:1.4)

And that: this process is supported, maintained, and facilitated by our brain in conjunction with our consciousness.

It truly is our own choice. We can consciously, in our own material minds using our vital brains reach up to spirit and choose God. Incredible.

GLOSSARY

ACTH: Adrenocorticotropic Hormone. Directs the adrenal glands to release adrenaline and cortisol into the body when stressed.

Adjutant Mind-Spirits: 7 Adjutant Mind-Spirits. Sevenfold mind bestowal of the local universe Mother Spirit on living creatures. And are designated as the spirits of wisdom, worship, counsel, knowledge, courage, understanding, and intuition.

Adrenal Gland: Releaser of stress hormones, epinephrine, (adrenaline,) & cortisol.

Agnostic Physicalism: Attitude regarding mind/brain: Mind is exclusively sourced from brain matter.

Amygdala: Watchdog of the brain. Fear barometer. "Lights up when emotionally important things happen, positive or negative. Just behind the hypothalamus. Mediates emotion. The major alarm bell.

Anterior Cingulate Cortes (ACC): Surrounds the Corpus Callosum. Role in decision-making. Helps to hold one's attention and to integrate feeling and thinking.

Attachment Theory: Theory explaining long and short term relationships based on an individual's ability to develop trust in a caregiver and the self. Based on the work of John Bowlby and focused on the social and emotional development of an individual and the regulation of feelings.

Autonomic Nervous System: Baseline bodily function. Connect brain to rest of body. Fundamental emotions—fear—joy—shame. Composed of Sympathetic Nervous System (arousal) and Parasympathetic Nervous System (quiescent).

Basil Ganglia: Directs habitual activities. And maintains the reward pathways. It is stimulated by dopamine and also seeks stimulation.

Belief: Defined biologically and psychologically as any memory, perception, cognition, or emotion that an individual consciously or unconsciously accepts as true.

Brain Stem: Helps maintain homeostasis by controlling autonomic functions. Coordinates with motor cortex and contains the pons, the medulla oblongata, and the midbrain. Producer of serotonin and dopamine.

Broca's Area: Area in left frontal cortex responsible for language, spoken and written, comprehension and processing.

Caudate Nucleus: One of the basal ganglia. Is involved in voluntary movement and emotion.

Central Nervous System: Consists of Spinal Cord, Medulla, Pons, Midbrain, Cerebellum, Diencephalon, and Cerebral Hemispheres

Cerebellum: Receives somatosensory input from the spinal cord, motor information from the cerebral cortex, and input about balance from the vestibular organs of the inner ear. Involved in posture, and coordinating head and eye movements. Has been related to language and other cognitive functions. Area of adult neurogenesis.

Cerebral Cortex: Anatomically divided into four lobes of functionally distinct regions. It is organized in layers and the layers organize input and output. Area of higher-level cognitive functions and sensory and motor control. Neo-cortex.

Cingulate Cortex: Located in the center of the frontal lobes. Controls the brain's ability to focus attention on individual's point of interest and sustain attention long enough for the individual to accomplish what was intended. Emotional regulator. Cortical regulator. And executive operating officer.

Cingulate Gyrus: A part of the limbic system that helps to regulate and monitor emotions and pain. Impacts body's response to offensive experiences. Responsive to fear and learning to avoid any negative consequences. Associates pleasant sights and smells with pleasant memories. Located above the corpus collosum.

Clinical Death: Vital signs stopped. Heart in ventricular fibrillation. No activity in cortex of brain (flat EEG). Brain stem activity ended. CPR cannot revive.

Cognitive Functions: Quantitative, Binary, Causal, Existential, Reductionist, Holistic, Abstract.

Coherence: Integration of diverse properties, values, and/or relationships. A making sense process, one's narrative, and the result of the integration of both hemispheres.

Complexity Theory: Study of the behavior of dynamical systems especially those that are sensitive to initial conditions. A self-organizing process will move toward complexity and when it is moving toward complexity it is at its most stable, most flexible, and most adaptive place.

Corpus Callosum: Connects the two hemispheres. Only limited information crosses. General activity of one hemisphere is transferred to the other hemisphere. These are not complex thoughts rather they are simplistic representations or nuances of thoughts or perceptions.

Cortex: The outer layer. Includes the pre-frontal cortex, cingulate, and insula. Involved in abstract reasoning, conceptualizations, values, planning, executive functions, impulse control, sensory functions, sensations, motor strip, perceptions, visual (occipital), temporal, language and memory, etc……

Cortisol: Released in response to stress. A steroid hormone produced in the adrenal cortex. Tends to suppress the immune system and reduces bone formation.

Cosmic Mind: Mind of the Seven Master Spirits, conditioned by time.

Dendrites: Branches of neurons, which propagate electrochemical stimulation from other cells such that information is passed on.

Diencephalon: Part of the forebrain contains the thalamus and hypothalamus as well as the epithalamus and the subthalamus.

DMT: Dimethyltryptamine. Naturally occurring. Leads to hallucinations, visions, and euphoria. Often referred to as the "spirit molecule".

Dopamine: Neurotransmitter involved in cognition, motivation, pleasure, and movement.

Dualistic Interactionism: Attitude regarding mind/brain: Consciousness and other aspects of mind can occur independent of brain.

Emergent Materialism: Attitude regarding mind/brain: Believe that mind emanates from the brain in ways that cannot be predicted nor reduced to a brain process.

Enteric Nervous System: Part of the Autonomic Nervous System that regulates the gastrointestinal system.

Epinephrine: (adrenaline). Significant in fight or flight response. Increases the flow of blood to the muscles preparing for flight or fight and increases the heart rate as well.

Epiphenomenalism: Attitude regarding mind/brain: believes that mind is a real phenomena but believe that it cannot have any effect on the physical world.

Epiphenomenon: Secondary phenomenon that occurs along with and alongside to primary phenomena.

Evolution: A divine design to reality-ize perfection from imperfection in time and space.

Executive Functions – Frontal Lobe: Goal orientation, initiation and maintenance. Flexibility. Resiliency. Impulse control. Categorization. Reasoning. Planning. Decision-making. Creativity. Analysis. Inhibition. Prioritizing. Time relation. Etc.

fMRI: Functional magnetic resonance imaging. Measures blood flow. Multiple images. Images of brain change by means of radio waves within magnetic fields.

Frontal Lobe: Planning future action. Control of movement.

Functionalism: Attitude regarding mind/brain: denies that mind is anything more that brain states….Mind is only a by-product of brain activity.

GABA: Gama-aminobutyric acid. Inhibitory neurotransmitter. Decreases activity in next neuron.

Glucocorticoid Hormones: Lower production of dopamine depletes norepinephrine.

Glutamate: Neurotransmitter. Stimulates or excites increasing the activity in the next neuron.

Gyrus: Fold in the brain.

Hippocampus: Located in temporal lobe. Involved in memory construction. especially long-term memory. Functions in spacial navigation. Balance with the amygdala. Looks like a sea horse.

Holy Spirit: The Creative Mother Spirit's gift to man. Becomes available as man begins to operate at the level of the top two adjutants (worship and wisdom). It provides spiritual reason, soul intelligence. It is a supermind bestowal.

Hypothalamus: Primal drive states. Regulates physiological and behavioral actions. Governs intensity of emotional behavior. Also controls many of the autonomic functions—body temp, sexual activity, BP, etc. Controls pituitary gland and prompts it to signal the adrenals.

Hypoxia: Reduced oxygen and system is deprived of adequate oxygen.

Human Mind: Personal mind. A gift of the Local Universe Mother Spirit through the use of her seven adjutant mind-spirits that is employed and individualized by the human.

Insula: Lower part of cerebral cortex. "Holds" bodily states that impact conscious experience. Is abnormally activated in the neuroimaging of a traumatized individual.

Senses the internal states of the body and is located in the inner area of the temporal lobe. Involved in the perception of danger.

Left Hemisphere Cerebral Cortex (Neo Cortex): Receives information from the right side of the body and directs activity to the right side. Analytical and mathematical processes. Time sequential. Rhythmical aspects. Language center (written and oral). This is the dominant hemisphere because of the language. Processes serially. Linear. Facts. Stored-details, categories, associations. Single. Separate functioning. "I am me". Literal. Makes sense.

Life Carriers: Higher order personalities who initiate life on the planets and assume responsibility for the early stages of biologic evolution.

Limbic System: (Amygdala, Hippocampus, and Hypothalamus) Involved with emotion and motivation. Aspects of emotional expression. Assigns emotional attraction or aversion to objects and experiences. Directs emotions to the external world via behavior. Connected to the ANS (Autonomic Nervous System) in eliciting emotional responses. Example: Fear—limbic relates feeling of terror—adrenaline released in the arousal system—heart pounds, alertness increases—stomach knots, etc.…results in full body awareness.

Local Universe Mother Spirit: (Divine Minister): Partner to Michael of Nebadon, our creator son and provider of the mind ministry of the seven adjutant mind-spirits.

Master Physical Controllers:

Medulla Oblongata: Part of brain stem. Regulating BP and respiration. Control of neck and facial muscles. Involved in taste, hearing, and the maintenance of balance. Direct rostral extension of the spinal cord.

Melchizedeks: Higher order of sonship who assist the Life Carriers in advancing the designs for life implantation on decimal planets (Urantia).

Memory:

Implicit Memory: Retrieved sense but don't feel as if it's a memory. No connect in terms of facts, more a general sense of knowing. Often laid down very early in life before left-brain is fully formed.

Explicit Memory: factual, autobiographical, and easily articulated.

Midbrain: Part of the brain stem.

Mighty Messenger: Ascendant mortal who has functioned loyally during the time of a rebellion.

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. (UB 0:5.8)"

Motor Area: The motor cortex of the brain. Part of brain engaged in the planning, the control, and the execution of voluntary movements. Mainly located in the frontal lobe in the dorsal gyrus.

Morontia: A term designating a vast level intervening between the material and the spiritual. It may designate personal or impersonal realities, living or nonliving energies. The warp of morontia is spiritual; its woof is physical. (UB 0:5.12)"

Myth: A story about early history often explaining ones origin and destiny and the natural world and frequently involving supernatural beings. The story though often widely believed is essentially false and over time may be proven untrue. However it often answers internal existential dilemmas.

Mystical Union (Unio Mystica): Mystical union with God or Absolute. In love.

Near Death Experience (NDE): Often times transformational experiences where an individual encounters a being of "light" considered to be "from the other side". This usually occurs when one is near death (accident, cardiac arrest, etc.) and is given the opportunity to return to "this" side. Individuals who experience this are frequently left with deep feelings of peace, quiet, and reassurance with a significant reduction in fear.

NeuroAxis: Way to conceive of the evolution of the brain. From the brain stem, through the Diencephalon, through the limbic system to the cortex.

Neurogenesis: Brain producing new cells, engaged with existing neural organization. Expands the present neural networks. May have specific triggers. BDNF (Brain-derived Neurotropic Factor) when the chemistry is activated by exercise. Intellectual stimulation. Cognitive skills. Emotional and social awareness all increase the production of new neurons. Pruning of neurons—a decrease due to lack of use (can be positive or negative).

Neuron: A cell, which can be electrically stimulated in such, a way that information is transmitted through electrical and chemical signals on through the neural networks and synapses.

Neuropeptides: Molecules that conduct emotional information up from the body to the limbic system. Discovered by Candice Pert. A means for experiencing emotion.

Neuroplasticity: Ability of the brain to adapt and change. Capacity to learn and to change itself. New neurons are able to connect and old neurons are able to connect

in new ways. When an individual experiences change in thoughts, emotions or behaviors there is a physical change in the nervous system. One's experience shapes the structure of neurons in the brain. What "fires together wires together". Possible entrainment.

Neuropsychology: Division of psychology specializing in brain function and how experiences, abilities, behaviors, etc. relate to brain structures and the processing of information. The functions of the brain are evaluated by standardized tests that objectively measure cognitive abilities, attention strengths and deficits, short and long-term memory, language skills, etc.

Neurotheology: An approach to Religious, Spiritual, and/or Mystical Experiences (RSMEs) that aspires to a neurological and evolutionary basis for spiritual experience.

Neurotransmitters: Chemicals in the brain that allow for transmission of information between nerve cells. Involved in the synapses.

DMT—Dimethyltryptamine
GABA—Gama-aminobutryic acid
Glutamate

Norepinephrine: Hormone and neurotransmitter released in the CNS. It mobilizes the brain and the body for action. Promotes vigilance, increases arousal, and focuses attention. Helps to feel alert and energetic.

Occipital Lobe: Located in the cerebral cortex. Involved in vision. Dorsal and Ventral streams in the occipital lobe process where the object is located (dorsal to parietal) and what the object is (ventral to the temporal).

Oxytocin: Hormone neuropeptide that is produced in the hypothalamus and increases social bonding. Oxytocin is released in childbirth, nursing, sexual orgasm as well as in loving relationships.

Parasympathetic Nervous System: Maintains homeostasis. Antithesis of sympathetic. Conserving bodies, resources, and energy. Regulates physiological maintenance and vegetative functions—growth of cells, digestion, relaxation, and sleep. Quiescent system. Relaxation and contentment. The off switch—calms us down. Part of Autonomic Nervous System.

Parietal Lobe: Attention area—involved in self—other as well as spatial—temporal orientation. Somatic sensation. Forming of body image. Relating one's body image with extra personal space. Somatic sensory Cortex. Motor Cortex. Coordinates movements in response to objects in our surroundings. Attentional awareness of our external world. Mapping. Number representation.

Personality: "The personality of mortal man is neither body, mind, nor spirit; neither is it the soul. Personality is the one changeless reality in an otherwise ever-changing creature experience; and it unifies all other associated factors of individuality. The personality is the unique bestowal which the Universal Father makes upon the living and associated energies of matter, mind, and spirit, and which survives with the survival of the morontial soul. (UB 0:5.11)"

PET Scans: (Positron Emission Tomography) Emissions from decaying radioactive isotopes.

Pituitary: Part of the HPA (hypothalamic-pituitary-adrenal) axis, which responds to stress. Stores and releases oxytocin.

Pons: Deep within the brain stem. Ventral portion: information about movement and sensation from the cerebral cortex to the cerebellum. Dorsal portion: Information about respiration, taste, and sleep.

Prefrontal Cortex (PFC): Attention area activates during concentration. Attention area also inhibits brain activity through the hippocampus. Higher brain functioning. Part of executive system involved in planning, reasoning, judgment, and social behaviors. Associated with cognition and personality. Sets goals, directs actions, and shapes emotions.

Process Philosophy: Attitude regarding mind/brain: Mind and brain are manifestations of a single reality that is in constant flux.

PSI Effect: Telepathic and psychokinetic phenomena.

QEEG Quantitative Electroencephalography): Electrical patterns on the surface of the scalp. Brain wave patterns. A color map.

Reticular Activating System (RAS): Stimulates other parts of the brain.

Right Hemisphere: Connects to left side of body. Non-dominant hemisphere. Abstract thought distinct from language. Non-verbal body awareness. Visual spatial perception. Perception, expression, and modulation of most aspects of emotionality, parallel processing. Holistic thinking. Gestalt with sensory, (smells, taste, sights, etc.). Connected. Whole. Present. We are one. Empathic capacity. Autobiographical memory.

Ritual: Ceremony or behavior done in a repetitive way that involves the senses with cognitive and emotional components. Tends to hardwire the brain in relation to the myth that the ritual supports.

RSME (Religious, Spiritual, and/or Mystical Experiences)

Serotonin: Neurotransmitter. Feelings of well-being and happiness. Maintains the "good mood".

Sensory Area: Area of cerebral cortex that receives input from the sensory neurons from the peripheral areas.

Somatosensory Cortex: Receives sensory information from the spinal cord, brain stem, and thalamus. Integrates the incoming information and produces a "homunculus map" similar to the one formed by the primary motor cortex.

Soul: "The soul of man is an experiential acquirement. As a mortal creature chooses to 'do the will of the Father in heaven,' so the indwelling spirit becomes the father of a *new reality* in human experience. The mortal and material mind is the mother of this same emerging reality. The substance of this new reality is neither material nor spiritual—it is *morontial.* This is the emerging and immortal soul, which is destined to survive mortal death and begin the Paradise ascension. (UB 0:5.10)"

SPECT Scans (Single-photon emission computed tomography): Radioactive tracer injected during an activity or practice (ex. Prayer, meditation, thinking). The tracer fixes on the brain at that moment and reveals what is occurring in the system at that very moment.

Spinal Cord: Base of skull to 1st lumbar vertebra. Receives sensory information from skin, joints, and muscles of the trunk and limbs. Contains motor neurons responsible for voluntary and reflexive movements.

Spiritual Brain: That part of the brain that research has indicated is the most active during "religious" and/or "mystical" experiences.

Stages of Faith: A developmental theory proposed by James Fowler suggesting that as the brain grows spirituality appears to develop in seven stages (0-6) starting in infancy with an undifferentiated faith and culminating in a universalizing faith stage often with a sense of union with God, deeply reflective, and revealing personal strength.

Stress Response: Activates HPAA (Hypothalamic-Pituitary-Adrenal Axis).

Substantia Nigra: Portion of brain that produces dopamine.

Sympathetic Nervous System: Fight or flight response. Physiological base of our adaptive strategies whether the stimulation is positive or negative. Sense of arousal. The on switch, blood pressure and heart rate increase. Part of Autonomic Nervous System.

Temporal Lobe: Many smaller structures contained within the temporal lobe. These substructures are responsible for facial and object recognition, memory

acquirement, emotional responses, and the comprehension of language. Significant in terms of learning, memory, and emotion.

Temporal Lobe Epilepsy: (TLE) Neurological condition where unprovoked seizures occur in the temporal lobe of the brain often with sensory changes. Some have attributed "religious experiences" to TLE.

Thalamus: Relays info between the cortex and the brain stem (also within other cortical structures). Active in many procedures including movement, attention, perception, timing, alertness, and awareness. The switchboard of sensory information.

Valence: Intrinsic attractiveness or averseness, especially with emotions

VMAT2 Receptor: Involved in regulating dopamine and serotonin. Sometime referred to as the "God gene".

Wernicke's Area: Linked to speech. Involved in the understanding of the written and spoken language.

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