Q4LT (Questions for the Lion Tamer)

By JC

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Introduction

This isn't necessarily a book but more so a compilation of blog postings that I was spurred to compile into a PDF in order to organize in a concise manner. The video's embedded within these postings did not transfer over during this process and I removed many pictures in order to alleviate any unnecessary print ink wastage so if you would like to see the content in it's entirety, visit Q4LT.com in order to do so.

In regards to the content at hand… I believe that while dimethyltryptamine (DMT) is a mysterious and important endogenous molecule to study, it should be looked at in a comprehensive manner. It is my opinion that the reductionist scientific mindset tends to overemphasize the necessity to reduce the conversation of a topic down to a few specifics. Whether this has given us a better grasp of the world and our places in it is has yet to be determined.

From my very crude observation of the topic of "DMT, it appears rather consistent that certain parameters seem to coincide with it's potential release in the body & brain. From a strictly biological, mechanistic viewpoint it appears as though elevated levels of the hormone Melatonin coupled with Alkalosis (suppressed Carbon Dioxide (respiratory) and even potentially Metabolic nearing death states) appear to reliably lead to altered states that hypothetically coincide with DMT synthesis. However, there are clearly other factors involved in different cases based on what appears to be a form of electrical/electromagnetic/magnetoelectric type of fluctuation within the body/brain.

This is not a simple subject to cover as the body's complexities in relation to the environment's complexities are literally infinite. Feel free to e-mail me with any feedback or insults at q4lt00@gmail.com. I hope you enjoy reading this thing.

II. Aha! Moments, REM Sleep, & Lucid Dreaming

The alarm sounds off at 6:30 am. You groggily turn it off.

Maybe you faintly recall a dream for a minute or two. You then quickly jump out of bed and hop in the shower to prepare yourself for a day of work, school, and/or tending to the family. From this point until you return back to a state of quietness and a lessening of physical and/or mental stimulus, you are likely to predominantly spend the majority of your day in the dominant brain wave state known as “Beta”. This state correlates with the frequency range between 12 and 30 Hz (some researchers will limit Beta to 25 Hz). Generally speaking when a person is in this state, they are experiencing varying degrees of being alert, engaged, and having focused mental activity. At the lower end (12 to 15 hz), one’s mood could be described as slightly brooding or idling (example: stuck in traffic, casually surfing the web). At the mid-range of Beta (16 to 22 hz) a person could be characterized as being strongly engaged (example: active, analytical problem solving). The upper range of Beta (23 to 30 hz) correlates with highly complex thought, the integration of new experiences, and excitement (example: creative problem solving).

When a person is awake but in a more relaxed state of being, their EEG wave is likely to be classified as “Alpha” which measures between 8 to 12 Hz. A behavioral characteristic of this state could be when you are daydreaming or in a non-engaged, relaxed state while watching television. This is generally the state that most people correlate with their recognizable and preferred state of relaxation. It’s not “overly” relaxed to the point of grogginess but the stress of one’s daily routines are markedly absent both physically and mentally.

The next EEG wave coincides with deep relaxation and possibly even light sleep. This is known as the “Theta” brainwave state and measures between 4 to 8 Hz. A behavioral characteristic of this state is normally when a person transitions from a relaxed state while laying in bed and eventually to the first stage of sleep. Theta is also recognized as a brain wave state induced during deep hypnosis, deep meditation, and sensory deprivation tank experiences.

The slowest type of EEG wave correlates with deep sleep known as “Delta” which measures between 0.5 to 4 Hz. Usually a person is in deep sleep when they are in this state. Experienced meditation practitioners have also been known to attain this EEG state during meditation.

(Note: Your brain is constantly emitting different frequencies simultaneously so when we refer to your specific brain wave state, we are referring to your *dominant* frequency.)

If these four brain waves (Beta, Alpha, Theta, & Delta) were the *only* brainwave frequencies humans generally experienced on a day to day basis, very basic "surface" logic would lead one to believe that the greater Hz levels would equate to potentially more precise and more accurate cognitive abilities. The logic would continue that as we slow down the dominant Hz frequency, our precise cognition would decrease and we would lose our abilities to "make sense" of the complex and intricate details. Anybody who has worked intensely on a project or task with any level of complexity can attest to the specific mental differences between pin-point focus/precision (example: a brain surgeon during surgery) compared to when one is on the couch watching their favorite movie… half paying attention, half day dreaming (example: a brain surgeon watching television). It would appear to make sense that at our peak focus and mental capabilities, we might hover in the 25 to 30Hz range during the day and in the evening we eventually slow down into light relaxation (10-12hz), deep relaxation (6-10hz), light sleep (4-6Hz), and subsequently deep sleep (0.5 to 4Hz).

If only things were so simple.

Gamma waves are classified as having a frequency of 30 Hz and above (some sources will cite anything above 25 Hz while others will cite only waves above 40 Hz). While analog electroencephalography (EEG) equipment was first introduced to the world nearly 100 years ago, the frequency reading for analog EEG was limited to 25 Hz and *lesser*. It wasn't until the advent of digital electroencephalography (EEG) equipment in the 1970's and subsequently ease of access to inexpensive microprocessors in the 1990's that brain waves 25 Hz and above (Gamma) could be observed with greater consistency, accuracy and ease.

It would appear somewhat logical that if a person is "daydreaming" at 12 Hz, "highly engaged" at 22 Hz, involved in very intricate, creative complexity at 30 Hz… there just might be the potentiality for even greater, more complex processing ability *above* 30 Hz. In 2009, a study was published in the journal Current Directions in Psychological Science titled "The Aha! Moment, The Cognitive Neuroscience of Insight". This study was based on measuring neural correlates during sudden comprehension in problem solving moments which are deemed as an insight or an "Aha!" moment. EEG equipment and (fMRI) functional magnetic resonance imaging were utilized to study the frequency (Hz) and areas of the brain which became activated during these moments. The study

concluded that insight solutions or “Aha!” moments are positively correlated with bursts of Gamma Waves (40 Hz).

Here is an excerpt from Brain World Magazine regarding the 2009 study:

“In the volunteers that experienced insight, Kounios and Beeman found a distinctive spark of high gamma activity that would spike one-third of a second before volunteers consciously arrived at an answer. Additionally, the flash of gamma waves stemmed from the brain’s right hemisphere—an area involved in handling associations and assembling parts of a problem. **Gamma activity indicates a constellation of neurons binding together for the first time in the brain to create a new neural network pathway.** This is the creation of a new idea. Immediately following that gamma spike, the new idea pops into our consciousness, which we identify as the Aha! Moment.

In addition, Kounios and Beeman noted a burst of slower, alpha-band activity over the right visual cortex—an area of the brain that controls our sight—occurring immediately prior to the burst of gamma waves. This unexpected finding suggests that the brain is quieting the neurons in that area to reduce the amount of distraction and visual interference taken in—similar to everyday circumstances, the way we close our eyes or look away when concentrating on a question—which then allows insight to pop into awareness.”

In 2008, a study was published in the Public Library of Science titled “Deconstructing Insight: EEG Correlates of Insightful Problem Solving” citing very similar results. The results of the study were as follows, “we found strong gamma band (40-48 Hz) responses at parieto-occipital regions which we interpreted as (i) an adjustment of selective attention (leading to a mental impasse or to a correct solution depending on the gamma band power level) and (ii) encoding and retrieval processes for the emergence of spontaneous new solutions.”

This is an extremely interesting finding being that it appears that there might be some basis for purposely quieting the mind and slowing the brain waves in order to consciously generate Gamma waves. If the conscious, active problem solvers in the study were able to generate mild Gamma wave spikes (40hz) that were immediately preceded by Alpha waves (8-12 Hz), there might be the potential for even greater Gamma wave spikes to manifest from inducing Theta (4-8 Hz) and even Delta (0.5-4 Hz) waves prior. In theory this would subsequently and simultaneously create more profound neural network development that leads to profound insights and possibly even

greater, currently unassimilated cognitive abilities and even “supernormal” physical abilities.

Overall these studies indicate that the 40 Hz range offers us the bursts of significant insight that we can touch upon during complex problem solving. The question gets progressively more intriguing… what types of intuitions and/or experiences can people have at 50 Hz… 60 Hz… or 70 Hz and above? Digging in even further… since these Gamma waves take place in split-second bursts, what type of information might a person be capable of generating if Gamma waves were to be somehow sustained for prolonged periods?

The million dollar question on this site always seems to come back to… **might this have any correlation with endogenously produced DMT?**

In 2005, a study published in the Journal of Psychoactive Drugs reported “increases in global EEG coherence (total brain synchrony) in the 36-44 Hz and 50-64 Hz (Gamma Hz) frequency bands for both subjects”. This was a small study that involved two experienced participants who consumed the shamanic brew known as Ayahuasca. A 1998 study published in the journal Phytomedicine would publish similar results citing: “Post-ingestion, we observed increases in power in the 36-44 Hz frequency band ("40 Hz”)“.

While this would be considered to be an externally administered form of dimethyltryptamine (DMT), it is still rather intriguing that Gamma waves appear to correlate with the experience.

Following the logic that a greater Hz measurement equates to potentially higher processing abilities and intuition it makes one wonder when DMT/Ayahuasca users describe a “realer than real” experience. While the term “hallucinogen” is utilized when discussing externally administered substances, it’s important to note that DMT is produced endogenously in humans as well as potentially all mammals. While it has yet to be officially verified, it appears as though DMT is likely produced during our sleep stages correlated with "dreams”.

(Q4LT believes that there is an undeniable correlation between significantly elevated Melatonin ($C_{13}H_{16}N_2O_2$) levels during deep sleep, breath rate (release of CO_2), and endogenous DMT ($C_{12}H_{16}N_2$) synthesis.)

In 2008, the Journal of Neuroscience published a paper outlining the relationship between Theta and Gamma coordination during REM sleep. Some notes from the paper are as follows (warning: most terms will be slightly incomprehensible without reading the entire paper and utilizing "google"): "Theta and gamma synchrony (simultaneous occurrence) was significantly higher during REM sleep compared to active waking."

"Whitened spectrogram of LFP recorded from the dentate molecular layer showing a typical period from REM sleep. Note the transient increases in the power and peak frequency of both theta and gamma oscillations. **The gamma power increase in the whitened spectrum typically peaked around 100Hz, but the elevated power in these bursts often extended up to around 250Hz."**

"Compared to tonic REM periods (no eye movement), phasic REM (rapid eye movement, muscle twitches, respiratory variability) epochs showed increased theta and gamma power throughout most hippocampal layers. Comparing phasic versus tonic REM also showed increased theta coherence among CA1 layers and between the dentate and CA1, the latter possibly indicative of more coherent inputs from layers 2 and 3 of the entorhinal cortex to the dendrites of the dentate and CA1 respectively."

"Gamma coherence increased among nearly all hippocampal regions during phasic REM compared to tonic REM (Fig. 5B,C), suggesting that while tonic REM is associated primarily with dentate/CA3 gamma synchrony, phasic epochs may provide short windows in which the dentate, CA3 and CA1 transiently synchronize."

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Whatever experiences that occur during "dream" states while sleeping are largely attributed to intelligible hallucinations. However, there are a few cases in which the information derived/interpreted during these "dreams" have led to important discoveries in science (ex. Einstein's "Speed of Light", Bohr's "Atomic Model). Some of these significant findings are outlined by Tara MacIsaac of the Epoch Times in "5 Scientific Discoveries Made in Dreams" and "4 More Scientific Discoveries Made in Dreams".

Does this equate to *all* dreams providing profound world changing information?

Not likely but it does lead us to ask the question whether the depth and profoundness of the insights taking place during waking and sleep states correlate with Gamma waves and potentially endogenous DMT synthesis. Based on the increased formation of new

neural network pathways during these moments/states, it would outwardly appear that this “growth” would be a good thing especially if correlated with emotionally positive experiences. One must remain cognizant that varying amounts of DMT have produced a wide variation of effects. In Dr. Rick Strassman’s study the lowest dose administered (0.05mg/kg) provided no psychedelic effects while the highest dose (0.4mg/kg, 800% greater than the lowest) provided profound “hallucinatory” experiences. The fact that Gamma waves up to 250 Hz were registered in the 2008 REM sleep study would appear to provide some tangible framework as to the brain’s increased “processing muscle” during these “dream” states.

Imagine what type of insights one might have in a conscious waking state of problem solving if they were able to generate 250 Hz!?!?

I digress… somewhat.

In any case, you’d be hard pressed to find any medical practitioner of any format that would declare deep sleep/REM sleep as being detrimental to the body and brain. In 2004, the American Psychological Association published some quotes from Dr. James B. Maas, a professor and former chairman of the psychology department at Cornell University who spoke at the Western Psychological Association’s 84th Annual Convention.

Quotes from Dr. Maas:
“Besides boosting alertness, sleep–particularly rapid eye movement (REM) sleep–is a way for the brain to store new information into long-term memory. The brain accomplishes this through a phenomenon that researchers have only recently come to understand: sleep spindles.”

“Sleep spindles–one- to two-second bursts of brain waves that rapidly wax and wane at strong frequencies, so-called for the spike image they form on an EEG reading–occur during REM sleep. The REM phase usually takes place toward the end of the night, between the sixth and eighth hours of sleep, when people are most likely to dream. The brain’s neural patterns during REM sleep resemble those of its awakened state.”

“During REM sleep, the brain busily replenishes neurotransmitters that organize neural networks essential for remembering, learning, performance and problem solving. Conversely, depriving the brain of sleep makes you clumsy, stupid and unhealthy.”

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A study published in 2013 in the Journal of Neuroscience outlined in great detail the multiple regenerative properties of sleep especially during the REM stage. There are dozens if not hundreds of peer-reviewed papers as to the physiological benefits of deep, prolonged sleep.

What about people who claim to have “lucid dreams”?
The formal definition of a “lucid dream” is: “any dream during which the dreamer is aware that they are dreaming. During lucid dreaming, the dreamer may allegedly be able to exert some degree of control over the dream characters, narrative, and environment.”

In 2014, a study was published in the journal Nature Neuroscience titled “Induction of self awareness in dreams through frontal low current stimulation of gamma activity”. In this study the researchers were able to induce “lucid dreams” in sleeping participants via electrical stimulation of the brain. The conclusion of the study was as follows: “We found that current stimulation in the lower gamma band during REM sleep influences ongoing brain activity and induces self-reflective awareness in dreams. Other stimulation frequencies were not effective, suggesting that higher order consciousness is indeed related to synchronous oscillations around 25 and 40 Hz (Gamma waves).”

A 2009 study in the journal Sleep published a study based on deciphering the physiological correlates of lucid dreaming. The results were as follows: Results show lucid dreaming to have REM-like power in frequency bands Delta and Theta, and higher-than-REM activity in the Gamma band, the between-states-difference peaking around 40 Hz. Power in the 40 Hz band is strongest in the frontal and frontolateral region.

Thus far we have established “Aha! moments”, REM sleep dreaming, Ayahuasca treatments, natural “Lucid Dream” states, and externally induced “Lucid Dreaming” with this mysterious Gamma wave… what else might there be?

III. Meditation, Hypnosis, & the Corpus Callosum

The general consensus of the benefits and/or reasons for employing the practice of meditation is in order to “quiet the mind” which leads to a de-stressing of the body. It’s interesting to note that while many people report the generally relaxing effects of meditating on a consistent basis, some practitioners will report transcendental states in which they experience deeply profound insights of a “spiritual” nature. These experiences are currently not easily assimilated in terms of how traditional scientific minds tend to view measurable reality. However, it’d seem important to put these “transcendental states” into context with what we currently *can* measure.

In 2004, the Proceedings of the National Academy of Sciences published a paper outlining the EEG states of long-term meditators during their meditative practices. The conclusions of the study were as follows: “The ratio of gamma-band activity (25-42 Hz) to slow oscillatory activity (4-13 Hz) is initially higher in the resting baseline before meditation for the practitioners than the controls over medial frontoparietal electrodes. This difference *increases sharply* during meditation over most of the scalp electrodes and remains higher than the initial baseline in the post-meditation baseline.”

In 2010, in the journal Cognitive Processes a paper was published studying the EEG readings during long-term “Vipassana” meditators vs. non-meditators. The results were as follows: “Relative increase in frontal theta (4–8 Hz) power was observed during meditation, as well as *significantly increased* parieto-occipital gamma (35–45 Hz) power, but no other state effects were found for the theta (4–8 Hz), alpha (8–12 Hz), or beta (12–25 Hz) bands. The findings suggest that long-term Vipassana meditation contributes to increased occipital gamma power related to long-term meditational expertise and enhanced sensory awareness.”

In 2004, Neuroscientist Dr. Richard Davidson’s would study the EEG waves emitted by Tibetan meditating monks and found some of the monks produced Gamma wave activity more powerful and of higher amplitude than any documented case in history. In 2008, Dr. Davidson would conduct another study with Buddhist Monk, Matthie Richard nicknamed “The Happiest Man in the World.” The EEG waves that Richard would showcase were considered to be literally “off the charts” in terms of significant strength.

Much like the numerous physiological and neurological benefits of deep sleep have been extensively reviewed, the general physical mechanics of meditation appear rather similar to those of sleep (EEG state & rhythm of breathing) and provide very similar

benefits it appears. The key difference between meditation and sleep is that in meditation, a person can consciously influence the general intent of the brain/mind whereas in sleep… it just goes crazy! (Just kidding… it goes wherever it goes.)

Another intriguing aspect of meditation is in regards to neuroplasticity. This refers to the ability for a person to literally change the physical structure of their brain. Being that we've outlined the fact that Gamma waves correlate with new neuronal connections actively taking place for the first time and the fact that Gamma waves are created in abundance for the long-term meditation practitioners, it should come as no surprise as to the positive emotional benefits of this practice. It shouldn't be a surprise that "The Happiest Man in the World" is a long-time, dedicated meditator. When people tend to think of a natural "happiness" chemical inside the body, they're generally familiar with the term "Dopamine". In the brain, Dopamine functions as a neurotransmitter transmitting signals from one neuron to another neuron. Logic tells us that the "Happiest Man in the World" who generates sky high Gamma waves creating massive new neuronal connections is most likely simultaneously generating sky high dopamine surges.

(A 1977 study published in the journal Life Sciences showcases increased production of striatal dopamine due to exogenous DMT administration in lab rats.)

But what about the transcendental experiences these long-time meditators seem to have?

Remember? The Gamma bursts of insights in the "Aha! moments" that occurred at the 40 Hz range?

Just because we can quantify those moments by utilizing "real-world" examples of insights based on scientific testing, it doesn't necessarily equate to the Buddhist monk's experience at 80 or even 200 Hz as being "unreal". There has to be a consistency in terms of hypothesis and analysis. Perhaps modern science lacks the wide lens, deep scope framework needed to assimilate these experiences into potentially a "greater" reality of truths? Or perhaps it's simply a lack of futuristic equipment that would allow us to peer into the world of higher level Gamma Waves?

Dr. Rick Strassman hypothesized that there might be a correlation between bursts of endogenous DMT during deep meditative states which coincides with the "mystical" experiences. Based on studying the general projected mechanics for DMT synthesis

and the physical aspects of meditative practice, the hypothesis doesn't seem far fetched whatsoever.

On to the next piece of the puzzle…

Hypnosis is a much maligned and misunderstood aspect of mind "tinkering". Many people think of hypnosis as a person clucking around like a chicken on stage after having a pocket watch dangled in front of their eyes. While there are such occurrences as this, there just might be a little more to this field of study.

In 2000, Brain Research Bulletin published a paper in regards to the EEG patterns of hypnotized volunteers. The findings were as follows: EEG activity showed a *significant increase in the gamma band* with a left fronto-central prevalence.

In 2004, a study published in the journal Pain outlined the differences of pain perception between waking and hypnotized volunteers. The results were as follows: "High hypnotizability, compared to medium and low ones, experienced significant pain and distress *reductions* for Focused Analgesia (visualization) during hypnosis and, to a greater extent, during post-hypnosis condition. Correlational analysis of EEG sweeps of each individual revealed brief intervals of phase ordering of gamma patterns, preceding and following stimulus onset, lasting approximately six periods."

In 2002, a study in the International Journal of Psychophysiology was published in regards to pain perception in regards to hypnosis and 40 Hz Gamma waves. The results were as follows: "Gamma activity (32-100 Hz) over prefrontal scalp sites predicted subject pain ratings in the control condition (r=0.50, P=0.004), and no other frequency/topography combination did."

It appears as though these mysterious Gamma waves have once again reared themselves during hypnosis. The question is whether the hypnotized volunteers are merely thinking they feel less pain or if they are in actuality feeling less pain.

At some point the question will be… does it really matter?

Let's take a look at some of the more "externalized" cases…

The human mouth is considered one of the most sensitive parts of the body. The concentration of nerve endings in the mouth appear to be quite vast.

Generally speaking, the process of removing a fully embedded molar from a person's mouth requires force and without the use of local or general anesthesia would be considered quite painful. The removal of a person's wisdom tooth/teeth is considered to be surgical by nature sometimes requiring general anesthesia (putting a person to "sleep" via sedatives) as well as local anesthesia (numbing in the area of the tooth removal).

In 2013, the Journal of Cranio-maxillofacial Surgery published a study in which 24 volunteers had two wisdom teeth removed. In each patient, one tooth would be removed utilizing hypnosis as a means of pain prevention while the other tooth would be removed utilizing local anesthesia. The results of the study were as follows:

"Of the subjects who underwent hypnosis, only two subjects (8.3%) reported pain after induction of hypnosis. In the local anaesthetic group, 8 subjects (33.3%) reported pain. The results of the study showed that patients in the hypnosis group had less pain during the first few hours post-operatively."

"Pain intensity in the two groups at 5- and 12-hours post-operatively exhibited significant differences. In the hypnosis group, 10 patients (41.7%) took analgesic medication; in the local anaesthesia group, 22 patients (91.7%) took the analgesic medication (P = 0.0001). In other words, patients reported less pain when they were under hypnosis."

This is rather intriguing based on the undeniable sensitivity of the mouth and the potential pain involved in extraction of the largest molars which was nullified by utilizing hypnosis (while likely inducing Gamma waves) more so than chemical anesthesia.

In 1999, Acta Chirurgica Belgica the official journal of the Royal Belgian Society for Surgery published a study regarding hypnosis and it's effects on thyroidectomy (thyroid removal) and cervicotomy (incision into the cervix of the uterus) in place of general anesthesia (complete sedation). The results of this study were as follows:
"All surgeons reported better operating conditions for cervicotomy using hypnosis. All patients having hypnosis reported a very pleasant experience and had significantly less postoperative pain while analgesic use was significantly reduced in this group."

There are other studies showcasing very similar positive effects in terms of hypnosis being effectively utilized in place of anesthesia. Here are a few others we've compiled:
Hypnosis as sole anesthesia for skin tumor removal
Hypnosis and dental anesthesia in children: a prospective controlled study
Hypnosis instead of general anesthesia in pediatric radiotherapy

Bilateral neck exploration under hypnosedation: a new standard of care in primary hyperparathyroidism?
Randomized clinical trial of local anesthetic versus a combination of local anesthetic with self-hypnosis in the management of pediatric procedure-related pain

It would appear pertinent to note that 5-Meo-DMT has been acknowledged to have analgesic effect within the mammalian body. A 1985 study in the journal Brain Research, observes that the analgesic effects of 5-Meo-DMT were reversed when noradrenaline (also known as norepinephrine) was depleted. This finding was corroborated in a 1987 study in the journal Physiology and Behavior. This would appear valuable to note as it pertains to significantly elevated norepinephrine (also known as noradrenaline) levels observed in hypnotized volunteers (but not control volunteers) as showcased in a 1991 study in the American Journal of Clinical Hypnosis.

It'd generally appear that amongst certain people that are more susceptible to being deeply hypnotized (possible somnambulists) that this form of mind alteration method can be tangibly useful in an externalized fashion. While the precise, measurable physiological mechanisms of what is taking place throughout the brain and body during hypnosis and pain perception have yet to be fully deciphered, there are some interesting notes from Dr. Robert O. Becker's book "The Body Electric". "The Body Electric" showcases extensive details of Dr. Becker's studies on the limb regeneration capabilities of salamanders.

The Body Electric:
(Charlie, Howard, and I decided to find out how the brain's DC (direct current) potentials behaved in humans. The electrodes we'd been using on salamanders couldn't be scaled up for people, but within a week Charlie invented some that would give us equally precise readings from the human head. We immediately found that the back-to-front current varied with changes in consciousness just as in the salamanders. It was strongest during heightened physical or mental activity, it declined during rest, and it reversed direction in both normal sleep and anesthesia. This knowledge led directly to the experiments, described in Chapter 13, that taught us much about how hypnosis and pain perception work.

One of the most exciting results of my collaboration with Dr. Friedman was proof that one's state of *waking* consciousness could change the perception of pain. Friedman, who already used hypnosis to control chronic pain in his patients, gave several of his best subjects hypnotic suggestions of arm numbness deep enough that they couldn't feel the prick of a needle. In each case, I found that the frontal negative potential of the

head became less negative, often reaching zero, as the client attained deep trance. The reading changed in the same direction as in anesthesia, only not as far. Then, when the suggestion for pain control was given, the arm potential reversed just as it had in response to procaine. Conversely, when a control subject was asked in normal waking consciousness to concentrate forcefully on one arm, its sensitivity to pain *increased*, and the hand potential became more negative. We found we could use this difference to determine whether a person was really hypnotized or just cooperating.

Some doubters (including myself, I'm afraid) had believed hypnoanalgesia was merely a state in which the patient still felt pain but didn't respond to it, but these experiments proved it was a real blockage of pain *perception*. It seems that the brain can shut off pain by altering the direct-current potentials in the rest of the body "at will". There's every reason to suppose that pain control through biofeedback or yoga likewise works by using an innate circuit for attenuating the pain signal, which releases a shot of the body's own pain-killers. When the signal is appropriately modulated, it releases endorphins (internally produced opiates), as shown by experiments in which an injection of the opiate-antagonist naloxone negates the anesthesia of acupuncture. I predict that research on this system will eventually let us learn to control pain, healing, and growth our minds alone, substantially reducing the need for physicians.)

Much like we've noted in past pieces on Q4LT that it appears as though altered EEG waves (slowing down) appears to lead to an increase in Melatonin production, we now find that these slower EEG waves also appear to coincide with elevated Gamma waves (new neuronal network development) bursts.

Knowing the immense complexity of the human body, there are likely other factors playing out during these states that has yet to be fully discussed.

HGH (Human Growth Hormone) is a natural hormone secreted by the Pituitary Gland. Throughout our lifetime, the production of this hormone speeds up during puberty which leads to our growth spurts. Once we reach our general adult age (18-20), the production levels decrease drastically. Generally speaking, our genetic code appears to read the internal hormonal environment that correlates with the ability to reproduce, and once certain parameters are met, the purpose of growth is complete.

However, the administration of exogenous HGH appears to be able to physically alter a person's ability to grow well past their perceived natural age limit. Some of the most well noted observations of the effects of HGH on a person's physique is amongst professional athletes (ex. baseball player Barry Bonds). These athletes have ingested

this hormone in order to enhance their physique and subsequently their physical performance. Some of the most visible side effects have been the increase in cranial circumference as well as the significant increase in the size of the hands and feet.

Naturally speaking… this isn't supposed to be possible without the outside forces of externally ingested synthetic substances.

Somatostatin is a growth hormone–*inhibiting* hormone (GHIH). It is produced in the hypothalamus region of the brain, small intestines, stomach, & pancreas. This hormone suppresses the release of HGH (human growth hormone) amongst numerous other hormones.

In 1993, a study was published in the journal Clinical Endocrinology outlining the effects of Melatonin and its effect on the stimulation of Human Growth Hormone secretion. The study found: **"it is likely that melatonin plays this facilitatory role at the hypothalamic level by *inhibiting* endogenous somatostatin release**."

In 2004, a study in the journal Pineal Research showcased the effects of externally administered melatonin on somatostatin-binding sites. The study found: "The present results demonstrate that melatonin decreases the activity of the SRIF (somatotropin release-inhibiting factor) receptor-effector system in the rat hippocampus, an effect which is apparently not mediated by melatonin receptors."

Where are we going with this?

In 1999, in the journal Alternative Therapies in Health in Medicine a study was published outlining the effects of hypnosis for the healing of bone fractures. Utilizing a small sample size of 12 patients, 6 were subjected to hypnotherapy and 6 were not subjected to hypnotherapy. The results were as follows: "Results showed trends toward faster healing for the hypnosis group through week 9 following injury. Objective radiographic outcome data revealed a notable difference in fracture edge healing at 6 weeks. These data suggest that hypnosis may be capable of enhancing both anatomical and functional fracture healing, and that further investigation of hypnosis to accelerate healing is warranted."

A few scientific papers imply externally administered Growth Hormone as accelerating bone fracture healing: Bone (2003), Clinical Orthopaedics and Related Research (2006), and Expert Opinion on Investigational Drugs (2009).

In 2006, in the Journal of American Academy of Dermatology a study was published in regards to balding (hair loss) and the potential use of hypnosis for treatment. The study encompassed a total of 28 patients who had previously failed to receive any benefit from conventional treatments. The results were as follows: “Scalp hair growth of 75% to 100% was seen in 12 patients after 3 to 8 sessions of hypnotherapy. Total growth occurred in 9 of these 12 patients, including 4 patients with alopecia universalis and 2 with ophiasis. In 5 patients, a significant relapse occurred.”

In 2008, International Journal of Clinical and Experimental Hypnosis published a separate study in regards to hypnosis as a means to address balding (hair loss). The results were as follows: “Twelve out of 21 patients, including 4 with total loss of scalp hair, presented a significant hair growth. All patients presented a significant decrease in scores for anxiety and depression. Although the exact mechanism of hypnotic interventions has not been elucidated, the authors’ results demonstrate that hypnotic interventions may ameliorate the clinical outcome of patients with AA and may improve their psychological well-being.”

In 1999, in the journal Psychotherapy and Psychosomatics a study was published in regards to hypnosis as a method to treat the skin condition known as psoriasis. The results were as follows: “Highly hypnotizable subjects showed significantly greater improvement than did moderately hypnotizable subjects, independent of treatment group assignment (active suggestion or neutral hypnosis).”

While these are just a handful of studies in which hypnosis was utilized to successfully address physiological conditions, it appears rather intriguing to consider the potential hormonal fluctuations that occur from inducing these “altered states” of being. It appears as though the effectiveness of hypnosis is largely predicated on the hypnotizability of a person. While many people might naively postulate “gullibility” as a factor of hypnotizability, it instead appears as though there might be distinct physical factors that play a key role.

The Corpus Callosum is a wide, flat bundle of neural fibers in the brain connecting the left and right hemispheres. It is the largest white matter structure in the brain and facilitates interhemispheric communication. In 2007, in the journal Neuroimage a study was published in regards to the positive correlation between the thickness of Corpus Callosum and increased intelligence.

In 2013, the publication Brain the Journal of Neurology outlined the distinct, measurable differences in Albert Einstein’s brain compared to the average population. While

Einstein's overall brain mass was quite average, his Corpus Callosum was markedly much thicker in all areas.

Here is the summary of the study of Einstein's brain: "In summary, to the best of our knowledge, this study is the first to investigate the connectivity of Einstein's cerebral hemispheres by comparing the morphology of his corpus callosum with that of 15 elderly healthy males and 52 young healthy males. We found that Einstein's corpus callosum was thicker in the vast majority of subregions than their corresponding parts in the corpus callosum of elderly controls, and that Einstein's corpus callosum was thicker in the rostrum, genu, midbody, isthmus, and (especially) the splenium compared with younger controls. These findings show that the connectivity between the two hemispheres was generally enhanced in Einstein compared with controls. The results of our study suggest that Einstein's intellectual gifts were not only related to specializations of cortical folding and cytoarchitecture in certain brain regions, but also involved coordinated communication between the cerebral hemispheres. Last but not the least, the improved approach for corpus callosum measurement used in this study may have more general applications in corpus callosum studies."

Interestingly enough, in 2004 a study published in the journal Brain outlined the fact that increased anterior Corpus Callosum is associated with hypnotizability and the ability to control pain. It's also interesting to note that studies published in 2010 in the Proceedings of National Academy of Sciences and 2011 in the journal NeuroImage observe that meditation leads to developing a thicker corpus callosum.

There are also studies showcasing what appears to be a correlation between Corpus Callosum atrophy and aging/Alzheimer's disease: Neurobiology of Aging (1994), Archives of Neurology (2002), Journal of Neurology (2004), Journal of Neurology Neurosurgery and Psychiatry (2005), and Public Library of Science (2012).

This goes back to the neuroplastic effects of meditation and other forms of mind altering states such as Ayahuasca, hypnosis, and possibly others. Unfortunately neuroplasticity goes both ways as the degradation of Corpus Callosum appears to coincide with lesser cognitive function.

We're beginning to digress again… somewhat.

Thus far we've cited studies in which hypnosis appears capable of effectively nullifying pain, regrowing hair, and speeding up bone fractures. We've also outlined the apparent correlation between Melatonin production, Somatostatin suppression which

subsequently correlates with increased HGH (human growth hormone) production. We've identified that Gamma Waves signify new neuronal connections throughout the brain which would appear to signify greater brain power during these moments. We've touched upon Corpus Callosum thickness playing a key role in the interconnectivity of both the left and right hemispheres of the brain. The question now becomes… what are the possibly most extreme potentials when utilizing the presented information?

IV. Growth Hormone & “Past Lives”

Based on the basic measurements including but not limited to the positive neuroplastic effects, systemic health benefits of sleep, and positive hormonal secretion… these induced altered mental states appear to work towards optimizing the functioning of the brain and body. Logically speaking it wouldn’t appear to make sense that a person producing elevated amounts of Melatonin, Dopamine, and HGH while actively regenerating would be considered to be in a *sub*-optimal state. I’d venture to say that these parameters would be much closer to the what health looks like rather than having the opposite parameters (low levels of Melatonin, Dopamine, & HGH, with atrophy of the corpus callosum).

In any case, let us continue the discussion of potentials during altered states. We’re still staying on hypnosis for now…

We ended the second part with asking the question about the possibilities of creating physical differences in one’s body while in this altered state. We cited the examples of studies showcasing the effectiveness of hypnosis for pain management, anesthesia, hair regeneration, tooth removal, as well as a few others.

These all seem rather useful mental tools to have access to. The question is… what else might we be able to access?

Dr. Milton Erickson was an American psychologist and psychiatrist who specialized in medical hypnosis and family therapy. He was the founding president of the American Society for Clinical Hypnosis. He was also a member of the American Psychiatric Association, the American Psychological Association, and the American Psychopathological Association.

In reading the book, Uncommon Therapy it is evident that Erickson’s approach appears quite unorthodox but intriguingly calculated. While his predominant field of therapy appeared to be alleviating various common forms of behavioral disorders, there are a few noted cases in which “uncommon” occurrences took place.

Probably one of the most famous cases of this “uncommon” occurrence is found in the book Ericksonian Approaches: A Comprehensive Manual. Here is the passage:
“In 1960, he told me about a 20-year-old man who grew 12 inches in height in the span of one year. In hypnosis, at the start of therapy, this stunted young man looked out on his world as though unwilling to grow, a modern-day Peter Pan. For example, he

described a room as though he were standing beneath a table. Similarly, a cow on his farm was visualized as though it were ten feet tall; his eyes were on a level with cow's udder. Growth began to take place when Erickson encouraged the man to hallucinate his world as though he were standing part way up a staircase. I said, "Why have you kept this report out of the literature?" Erickson smiled and said, "No respectable editor of a scientific journal would publish such an impossible thing." "Dr. Erickson," I answered, "You are the editor of a respectable journal." He smiled again and said, "I would like to keep my job." (Cheek, 1982, p. 282.)

A 20 year old man growing 12 inches in height in one year?

It surely sounds improbable but since we've already outlined the projected hormonal fluctuations from hypnosis (melatonin-somatostatin-HGH), there appears to be a potential biological foundation in place. The following studies showcase the effectiveness of external HGH administration in increased height: New England Journal of Medicine (1999), British Medical Journal (2002), Journal of Endocrinology Metabolism (2004), and the International Journal of Pediatric Endocrinology (2014).

(**Interesting note #1:** The disease known as cancer is considered to be an "uncontrolled division of abnormal cells in a part of the body". It appears as though breast cancer is associated with abnormally elevated levels of the sex hormones, androgen and estrogen. While cancer is hardly considered to be a type of "positive growth" in one's body, it is a growth based *at least partially* on hormonal fluctuations nonetheless. It's recently been observed that the incidence of various forms of cancer and mental depression have a significant correlation outlined in Biological Psychiatry in 2003 and Neoplasma in 2009. It's important to keep this in mind as we proceed forward.)

Here is another excerpt from Ericksonian Approaches:
"Erickson recognized the importance of healthy body imagery. He used hypnosis to help at least two young women allow their breasts to grow in response to their own hormones. They had previously inhibited such interaction, considering themselves unfeminine and unattractive (Erickson and Rossi, 1980b, p. 183–5)." (This was published in the American Journal of Clinical Hypnosis in 1960, Volume 2, Issue 3.)

It's yet another example of what might be considered improbable effects of hypnosis without comprehending the potential underlying, *measurable* factors.

In 1974 in the Journal of Sex Research, a study was conducted by Dr. James E. Williams regarding the effect of hypnosis on the breast enhancement of women. The details of the study were as follows:
“The first phase compared hypnosis with and without suggestions for breast growth in six subjects. The second phase examined the effectiveness of hypnotic suggestions of breast growth in thirteen subjects acting as their own controls. Analysis of the data indicated that hypnosis per se had no direct effect on breast growth, but that hypnosis *with suggestions for breast growth* was effective in stimulating breast growth.”

In 1977 a follow up study was conducted by Dr. Allan Staib & D.R. Logan of the University of Houston regarding the replication of the 1974 study. The study was published in the American Journal of Clinical Hypnosis: Volume 19, Issue 4. The conclusion was as follows:
“An experiment was designed in an attempt to replicate the findings of a previous study (1974, Dr. Williams) which indicated that hypnosis could be used effectively to stimulate breast growth in adult women. Three adult women were given a series of hypnotic treatments in which sensations of breast growth were suggested. It was found that hypnotic stimulation of breast growth did result in larger breasts. A three month follow-up, not included in the previous study, demonstrated that while some decrease had occurred during the three months after the cessation of treatment, 81% of the gains made were retained.”

(**Interesting Note #2:** It’s been noted that children as old as 11 years old have been able to regenerate the tips of their severed fingers. This was observed in cases documented by the Journal of Hand Surgery in 1993 & 1995. This ability is also acknowledged in the journal Regenerative Medicine in 2014. Perhaps it’s important to note the predominant EEG state of children and their ability to regenerate vs. the average adult?)

In 1977, in the American Journal of Clinical Hypnosis a study was published by psychologist Dr. Richard D. Willard regarding the potential for hypnosis to induce breast growth in women. Here are the details from the study outlined in the book “Bodypower”:

“22 female volunteers, ranging in age from 19 to 54, were asked to use self-hypnosis and visual imagery in an attempt to enlarge their breasts. At the start of the study, which was eventually described in full in the American Journal of Clinical Hypnosis, five individual breast measurements were taken for each woman - circumference, height, width and other measurements were recorded by a doctor who was not involved in the

experiments. The volunteers then attended Dr Willard's clinic once a week for six weeks and once every two weeks for an additional six weeks.

At the first session the women were taught how to relax their muscles by using the same sort of technique as the one I have already described in this book. Subsequently, they were asked to do this and then to imagine that they had a wet, warm towel draped over their breasts. They were asked to imagine that the towel was making their breasts feel warm, or - if they found this difficult - to imagine that a heat lamp was shining directly onto their breasts.

Once the women were satisfied that their breasts were getting warmer, they were asked to develop an awareness of a pulsation within their breast tissue. It was suggested to them that they should become conscious of their heartbeats and feel each new beat pushing blood into their breasts. They were told to practise this exercise every day at home.

At the end of the 12-week experiment, 28 per cent of the women had achieved the growth in breast size that they wanted, 85 per cent had confirmed that a significant increase in their breast size had been achieved and 46 per cent had reported that they had had to buy bigger bras. The average increase in breast circumference was 1.37 inches; in breast height, 0.67 inches; and in breast width, 1.01 inches. Most women reported that by the end of the experiment they could feel warm blood flowing into their breasts simply by thinking about their breasts.

There were other advantages, too! Those women who had - at the start of the experiment - complained of having breasts of unequal size, reported that their breasts had become equal in size. All the women reported that their breasts were now firmer. And some 63 per cent of the women, who had complained of having pendulous breasts when the experiment had started, reported that the fullness and the contours of their breasts had returned. Incidentally, to make sure that the extra breast size hadn't just been achieved by an increase in weight, the women were also weighed at the start of the experiment. At the end of the 12-week period 42 per cent of the women had actually had a weight loss of greater than 4 pounds, but had all nevertheless noticed an improvement in their breast size.

When he studied the changes, Dr Willard found that there was no correlation between the increase in size and the size of the breasts at the start of the experiment. He did, however, find that there was a correlation between the ease with which the women were able to visualise blood flowing into their breasts and the increase in size which they

obtained. The only two women who subjectively felt that their breasts had not increased in size (but who did, in fact, have a measurable increase in bosom dimensions) had both had difficulty in feeling the effect of the warmth on their breasts."

Adult height growth, adult breast growth?

If cancer signifies an abnormal growth of cells and is linked to mental depression, could it be possible to induce *desired* growth from inducing a completely different type of mental state which optimizes "good" hormones? If children have consistently shown the ability to regenerate their severed fingertips fully while adults cannot… what is the main difference in mental and hormonal levels compared to adults?

It's interesting to note that according to numerous anecdotal claims by hypnotherapists across the world, the spontaneous remission of cancer has been observed amongst a number of patients. If stress/depression is one of the main culprits of cancer development, it'd appear that a spontaneous remission would likely be synergistically linked to a spontaneous change in emotional state. A 2016 study in BMC Neuroscience showcased the "spontaneous remission of depressive behavior induced by chronic restraint stress in mice". The conclusion of the study was as follows:
"Using persistent brain network homology analysis of EEG signals from eight cortical regions, we found that restoration of **gamma activity** at the network level is associated with behavioral remission."

Could this observation be the potential link between the spontaneous remission of cancer using hypnosis and potentially many other similar altered states?

The big difference between hypnosis and the external administration of substances is the measurability factor. In administering a drug or compound, it is usually isolated, measured, and administered orally, transdermally or injected. When it comes to hypnosis, factors such as hypnotizability of the patient (corpus callosum development), expertise of the hypnotherapist, and consistency of application are key variables.

The key takeaways from the 1977 study by Dr. Willard is in regards to the consistency of application. It was a 12 week study (84 days) in which daily practice of self-hypnosis was induced by each volunteer. The volunteers would also attend a total of 9 hypnosis sessions by Dr. Willard. In completely unquantified theory… this would equate to 75 total microdoses of HGH (self hypnosis techniques) and 9 full doses of HGH (hypnosis administered by Dr. Willard). A 1998 study in Gynecology Endocrinology showcased the effectiveness of administering a compound to enhance expression of IGF-1 (insulin-like

growth factor 1) in order to increase breast size in women. Incidentally melatonin also appears to enhance expression of IGF-1 outlined in Growth Development & Aging in 1990, Experimental and Clinical Endocrinology & Diabetes in 1997, and the Journal of Pineal Research in 2008.

In addition, if we are to believe that the nervous system is the basis for communicative function between the brain and body, the relationship between Melatonin and Nerve Growth Factor (NGF) would appear key. If one were to assume that these results of physical enhancement are "real" we would presume that there would be distinct changes in Growth Hormone fluctuations as well as the nerves that transmit the signal(s). Here are a few studies supporting the role of Melatonin (which increases during "meditative-like" states) on NGF: Journal of Pineal Research (1998), Journal of Neuroscience Research (1998), and Neurology and Clinical Neurophysiology (2002).

The more you dig into the details… the *less* far-fetched the results would appear to be.

Obviously this is based on extremely crude observation but it is an observation nonetheless.

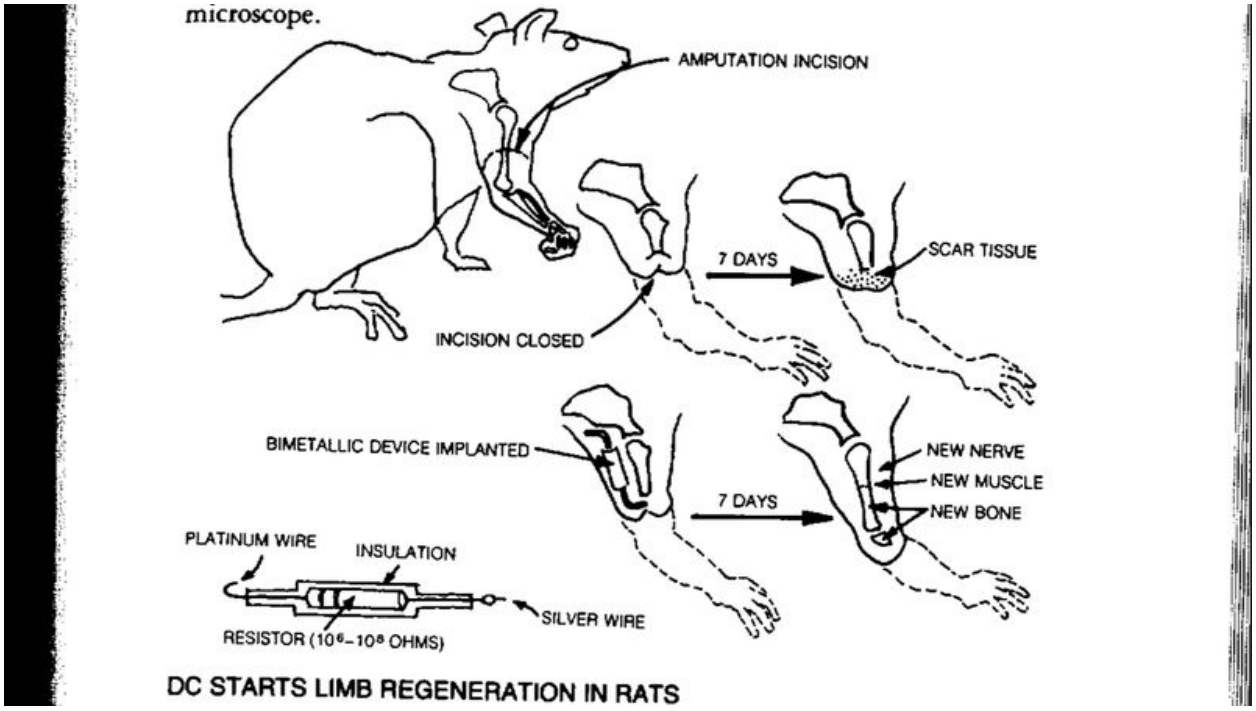
Additional interesting notes from the group of studies is that in the 1974 study, hypnosis by itself had no effect on breast growth. It was only hypnosis with *suggestion* for breast growth that actually stimulated the positive effect. In the 1977 study by Dr. Willard there was also a correlation between the ease of "visualization of blood flowing into their breasts and the increase in size which they obtained". These findings would be extremely difficult to quantifiably measure utilizing traditional biological parameters.

This is a case of "unexplainable" effects that correlate with intention of the mind. Perhaps they can be measured utilizing a specific frequency of infrared camera or some sort of electrical flow capture device?

In Dr. Robert Becker's book "The Body Electric", he outlines an experiment in which he simulates the bio-electrical current that salamander's utilize to regrow their severed limbs. Traditionally speaking, a fully mature rat isn't capable of regenerating an arm that has been clearly severed past the elbow. However regeneration is exactly what was observed in his experiments in the 1970s and has been replicated recently in a study published in 2015 in the journal Scientific Reports.

Could it be possible that the observed changes in DC (direct current) within the brain ("The Body Electric") during hypnosis could potentially create the precisely altered

electrical stimulation for “improbable” growth and regeneration? Perhaps certain electric frequencies are more easily “transferred” via the aspect of visualization than others?



But once again… we’re beginning to digress.

(**Interesting note #3:** The creator of the first EEG machine in 1924 was a man named Hans Berger. Berger created the machine specifically to quantify what he believed as an undeniable ability of humans to invoke “telepathic” transfer of thought. Berger would fail in his attempt and I have the sneaky suspicion that one of the key aspects of this was due to the inability to capture higher level Gamma Waves prior to creation of the digital EEG in the 1970s. He was likely on the right path but just so happened to be born in the wrong era. Q4LT has previously laid out the physiological hypothesis for consciously induced telepathy.)

Let us postulate that all of these abilities are indeed “real” and that we in actuality have untapped powers of the mind when utilizing various techniques to purposely quiet the brain in order to tap into higher Hz levels (Gamma waves) and possibly DMT synthesis. The question then becomes… does it make *logical* sense to completely discard the information derived from these altered states?

For example, during hypnosis… especially somnambulistic states (ultra deep hypnosis), some hypnotherapists have stumbled upon patients that begin to discuss “past lives”. It appears as though this occurs unexpectedly as the hypnotherapist attempts to “regress” the patient to an earlier part of their life that they aren’t able to consciously recall. It appears as though instead of merely delving into early childhood, the patient vividly begins to describe experiences not associated with their current lifetime.

It’s a strange phenomena to say the least.

This occurred in the case of Yale alumni Dr. Brian Weiss which led to him authoring the book “Many Lives, Many Masters” and subsequent follow up books. A similar phenomena occurred to self-proclaimed atheist Dr. Michael Newton who would go on to author “Journey of Souls” and a few other books.

In 1993, in the International Journal of Psychophysiology a study was published outlining EEG analysis during hypnotic induction, hypnotic dream and age regression. The results were as follows: “In eyes-open and -closed conditions in waking and hypnosis highly-hypnotizable subjects produced a greater **40-Hz EEG amplitude (Gamma waves)** than did low hypnotizable subjects at all frontal, central and posterior locations. Theta power was never a predictor of hypnotic susceptibility, 40-Hz EEG amplitude displayed a very high main effect ($p < 0.004$) for hypnotizability in hypnotic conditions by displaying a greater 40-Hz EEG amplitude in high hypnotizables with respect to lows.”

Once again we see these mysterious Gamma waves associated with hypnotizability and even more specifically age regression hypnosis. It’s interesting to note that the following studies have equated Theta-Gamma coupling associated with both short-term and long-term memory recollection: International Journal of Pyschophysiology (2002), Neuroimage (2004), and Technology and Healthcare (2015).

Could it be that during these deepened states of consciousness, high level gamma waves are induced which allow the person to “recall” information in which the origin is currently unknown? Something like an “ULTRA-Aha!” moment?

Q4LT has extensively covered the potential physiological aspect of “reincarnation” recall amongst hypnotized adults as well as children in the piece titled “Statistics of Reincarnation”. We included the work by Dr. Ian Stevenson and Dr. Jim Tucker at the University of Virginia in which over 5,000 documented cases of children seemingly recalling “past lives”. It surfacely appears as though there might be some distinct

similarities in terms of EEG state and potentially hormonal release in both hypnotized patients and young children during recall.

The concept of reincarnation and “past lives” is rather unscientific by nature. It is not a field of study that can be quantified utilizing traditional scientific means. However, that doesn’t equate to the validity of discarding the concept altogether especially if enhanced abilities are observed that coincide with very similar physiological states during hypnosis. It simply lacks consistency to embrace the aesthetic aspects of hypnosis, accelerated healing of hypnosis, hair regenerating abilities of hypnosis, and the overall physiological benefits of hypnosis only to discard whatever doesn’t fit into one’s measurable “belief systems”. At the same time it doesn’t equate to ingesting the information and taking every word as “gospel” but to discard it completely would appear to be inconsistent which is rather an unscientific quality within itself.

We do understand that some of these concepts might make some readers a bit “uncomfortable” as we are beginning to push the boundaries of what we believe about our inherent nature. As the saying goes… growth spurts can tend to be uncomfortable. However, we’ve tried to remain as consistent as possible as it pertains to Gamma waves and the possibilities of endogenous DMT synthesis that correlates with these innate abilities and insights.

V. Hypnagogia, Sleep Paralysis, and “OBE’s”

In part IV, we dug a little deeper into the anomalistic aspects of hypnosis (especially the somnambulistic states).

We believe that in order to make a little bit of sense of most anomalies in life, it helps to dig into the polarities of virtually each occurrence. In order to digest the potentiality for “positive” physical manipulation, it’d appear important to understand “disease” and/or “negative” physical manipulation. The physiological mechanics behind one concept can help to potentially open up the pathway to discover an essential key for another concept.

The official definition of hypnagogia is “the experience of the transitional state from wakefulness to sleep: the hypnagogic state of consciousness, during the onset of sleep.” In terms of EEG state (which we covered in Part 1), it would appear to go in the order of Beta (12-30 Hz), Alpha (8-12 Hz), Theta (4-8 Hz), and Delta (0.5-4 Hz). For the majority of people the “hypnagogic” moment would seem to occur in the Alpha/Theta EEG state as a person transitions from deep relaxation to light sleep.

Thomas Edison is known as one of the greatest inventors and scientists of the past 200 years. His impact on the modern world in terms of innovation and improvement of industrial technology is immeasurable.

One not-so-well-known facet of Edison’s creative arsenal was the fact that he regularly utilized a technique in order to induce hypnagogia on purpose. He believed this technique played a key role in developing ideas that he had difficulty solving during his regular waking state.

His technique was as follows… Edison would sit down in a chair while holding heavy metallic balls. He would attempt to retain a relaxed focus on his topic of choice and as he would drift off to sleep, the balls would drop to the ground subsequently making a loud noise that would wake him up. It is during these moments that Edison claims he was able to tap into solutions that he was incapable of producing while wide awake.

This is rather intriguing based on apparent correlations with the study regarding “Aha! moments” published in Current Directions in Psychological Science in 2009 (presented in more detail in Part 1). Here is the specific excerpt as it pertains to the potential mechanisms Edison utilized to create insights:

“In addition, Kounios and Beeman noted a *burst of slower*, alpha-band activity over the right visual cortex—an area of the brain that controls our sight—*occurring immediately prior to the burst of gamma waves*. This unexpected finding suggests that the brain is quieting the neurons in that area to reduce the amount of distraction and visual interference taken in—similar to everyday circumstances, the way we close our eyes or look away when concentrating on a question—which then allows insight to pop into awareness.”

It appears as though the purpose of quieting the mind is in order to consciously induce the Gamma wave(s) necessary for deeper insights. From a very basic analysis… self-induced hypnagogia seems to be rather similar in physiological mechanics to self-hypnosis and/or even meditation.

A book titled “The Encyclopedia of Creativity” written by Dr. Marco A. Runco & Dr. Steven R. Pritzker outlined the fact that luminaries such as Beethoven, Richard Wagner, Walter Scott, Nikola Tesla, Salvador Dalí, and Isaac Newton all credited hypnagogia and similar altered states as playing a key role in enhancing their creativity.

While the concept of hypnagogia can seem like it can potentially open the door to a multitude of greater creative abilities, there are other unexplained phenomena that have reportedly taken place during this “altered state”. People have reported sensations ranging from taste, smell, temperature fluctuation, to audio and visual “hallucinations” during hypnagogic episodes. There has even been a labeling/diagnosis of “Exploding Head Syndrome” (EHS) for people who experience loud imagined noises (bomb(s) exploding, gunshot(s), or crashing sounds) as they fall asleep. One of the most commonly reported side effects from inducing hypnagogia (inadvertently or on purpose) is the experience known as “sleep paralysis”.

Sleep paralysis is classified as the phenomena in which a person temporarily experiences an inability to move, speak, or react during the transition of falling asleep (hypnagogia). It is reported to be accompanied by hallucinations (such as an intruder in the room) to which one is unable to react due to paralysis, and physical experiences (such as strong current running through the upper body).

Being that DMT (dimethyltryptamine) is considered to be a “hallucinogen” naturally produced in the human body (as well as potentially all mammals), it leads us to believe that there is likely a correlation between endogenous DMT synthesis and hypnagogia/sleep paralysis. This doesn’t necessarily equate endogenous DMT release as *only* occurring during hallucinogenic states. Based on Dr. Rick Strassman’s study of

administering different levels of DMT to volunteers, it's quite clear that the different levels of DMT signify vastly different experiences… some hallucination inducing, some not.

A handful of studies have verified EEG recordings of people during hypnagogic states/sleep paralysis episodes showcasing elevated slow EEG waves that coincide with "vertex sharp-wave" stages (appear to be Gamma spikes) outlined here: Sleep (1996), Sleep (1997), Psychiatry and Clinical Neurosciences (1998), Psychiatry and Clinical Neurosciences (1999), Clinical Neurophysiology (2000),

The book "The American Psychiatric Publishing Textbook of Psychopharmacology" states that "sleep paralysis" is an "admixture of REM sleep and awake". Being that in Part 1, we outlined the fact that Gamma waves as high as 250 Hz have been recorded during REM sleep, it would seem rather logical that Gamma wave spikes coupled with slow wave (Theta/Delta) might potentially correlate with DMT release and subsequent experiences during sleep paralysis.

The question is… what to make of the experiences that take place during this phenomena?

The field of sleep paralysis study had led to the development of 2 categories of the phenomena. The first, more common category is known as "isolated sleep paralysis" (ISP) which are infrequent and may occur only once in an individual's lifetime. ISP episodes are generally short (usually no longer than a minute) and are typically associated with "intruder/demonic hallucinations". The second, less common category is known as "recurrent isolated sleep paralysis" (RISP). RISP episodes are considered chronic conditions in which a person can experience regularly throughout their lifetimes. These episodes can last an hour or longer and have typically been associated with the phenomena known as an "Out of Body Experience" or "OBE". (Some circles refer to "OBE" as "Astral Projection")

The general definition of an OBE is as follows: an experience that typically involves a feeling of floating outside one's body and, in some cases, the feeling of perceiving one's physical body as if from a place outside one's body.

If we can tangibly quantify the other anomalies outlined in the previous chapters, it would appear rather *inconsistent* to simply discard the experiences from hypnagogic induced sleep paralysis as merely "hallucinations". This is especially true in the face of

“consistency of experience” with unconnected, unrelated people across the world for hundreds if not thousands of years that have had very similar experiences.

Does this automatically equate to “demons”, or “OBE’s” that are experienced during hypnagogia/sleep paralysis as being “real”?

Not necessarily.

However, it does warrant further discussion or research into literature as to what these experiences might signify. Much like in part 3, we made the argument that it’d lack consistency to embrace the tangibly beneficial aspects of hypnosis (natural anesthetic, physical enhancement, physiological benefits) while discarding anomalies such as “past-life recall”, we cannot replicate this faulty thought process for hypnagogia/sleep paralysis.

A 2005 paper in the journal Progress in Brain Research regarding the “Out of Body Experience” concluded the following: “The reviewed data suggest that OBEs are due to functional **disintegration of lower-level multisensory processing** and **abnormal *higher-level* self-processing at the temporoparietal junction (TPJ)**.”

A 2010 paper in the journal Psychiatry Research outlined a study in regards to the effects of meditative states on “gray matter” (the “good” stuff) density of the human brain. The results were as follows: “Whole brain analyses identified **increases in the posterior cingulate cortex, the temporoparietal junction(TPJ), and the cerebellum** in the MBSR (Mindfulness-Based Stress Reduction) group compared to the controls. The results suggest that participation in MBSR is associated with changes in gray matter concentration in brain regions involved in learning and memory processes, emotion regulation, self-referential processing, and perspective taking.”

A 2008 study published in the Public Library of Sciences showcased the effects of meditation on TPJ activation. The study concluded: “The comparison between meditation vs. rest states between experts and novices also showed *increased activation in amygdala, right temporoparietal junction (TPJ), and right posterior superior temporal sulcus (pSTS)* in response to all sounds, suggesting, greater detection of the emotional sounds, and enhanced mentation in response to emotional human vocalizations for experts than novices during meditation.”

A 2006 study in the Journal Neuroscience published a study in regards to the effect of electromagnetic stimulation of the brain. The study found that stimulation to the right temporoparietal junction (TPJ) induced an “OBE”.

It’s interesting to note that while the overall health benefits of meditation based on hormonal fluctuations are undeniable, the neuroplastic effects appear to positively optimize the structure of the brain. If the level of temporoparietal junction (TPJ) activation correlates with the “OBE” phenomena and meditation increases development of the TPJ, what can that tell us about these experiences as a whole?

The above studies succinctly contradict the conclusion of a 2004 study in the journal Brain which *assumes* the following regarding “OBEs”: “We argue that both disintegrations (personal; personal-extrapersonal) are necessary for the occurrence of OBE and AS, and that they are due to a paroxysmal cerebral dysfunction of the TPJ in a state of partially and briefly impaired consciousness.”

To label “dysfunction” of the TPJ as a reasoning for OBE experiences appears contradictory as it potentially appears that *optimized* function of the TPJ via regular implementation of meditative states might lead to “OBEs”.

A bit of a premature speculation?

Once again… if looked at in a singular fashion, yes it’d be considered premature but when looked at in totality as it pertains to the information discussed in previous chapters & hormonal balance that leads to optimization of health, as well as future data/experiences that we’ll discuss, I don’t believe it is neither premature nor a speculation. It’s intriguing that “OBE” phenomena has also been reported from hypnosis, Ayahuasca/DMT sessions, and meditative states as well.

A 2005 study in the journal Progress in Brain Research implicates that *impaired metabolism in the temporoparietal junction (TPJ)* could partly explain the impaired consciousness seen in Alzheimer’s disease. A 2006 study in the journal Human Brain Mapping came to similar conclusions stating: “another measure of anosognosia (unawareness of mental/physical disability), was negatively related to metabolic activity located in the temporoparietal junction (TPJ), consistent with an impairment of self-referential processes and perspective taking in Alzheimer’s disease.

It’s interesting to note that in 2014, a study published in Neuropsychopharmacology attributed *increased* temporo-parietal junction (TPJ) and the medial frontal cortex

activity as being key in extensive dream recollection during sleep. In unrelated studies, the Journal of Consulting Psychology (1959) and the Journal of Clinical Psychology (1970) both concluded that dream recollection correlated positively with intelligence.

And yes… I've *been* digressing quite extensively.

Gamma waves, DMT, and now… "Out of Body Experiences".

It'd seem rather fitting that the concept of the spirit "leaving the body" would correlate with a burst of "Spirit Molecule" (DMT) *within* the body.

Organizations such as the TMI (The Monroe Institute) and IAC (International Academy of Consciousness) have researched this phenomena quite extensively. The Monroe Institute was founded in 1974 by Robert Monroe who would author three books regarding the OBE phenomena titled "Journeys Out of the Body", "Far Journeys", and "Ultimate Journey". The current president of the IAC (founded in 2000), Luis Minero has published a book titled "Demystifying the Out of Body Experience". He also taught a course on "OBE's" at Miami Dade college from 1997 to 2002.

One of the most extensive publications (1248 Pages) in terms of the "OBE" experience is a book titled "Projectiology" written by Dr. Waldo Vieira.

Interestingly enough… many of the techniques utilized to "leave the body" appear to mimic meditative/hypnotic techniques and correlate with physiological mechanics of endogenous DMT synthesis.

I understand that this concept is difficult to digest as the properties of a "spirit" or "soul" have yet to be quantified by "modern science". Perhaps what is needed is the proper equipment/cameras to capture the transpiration of an "OBE" in real-time. It's pure speculation but possibly a properly calibrated infrared camera, or "dark matter" camera could do the trick. As far-fetched as much of this sounds, we must remain cognizant of the fact that physiologically speaking, many of these "altered" states appear to correlate with optimized functioning of the human body. It'd be an entirely different perspective if these "altered states" were a by-product of sub-par or detrimental physiological conditions. Just because we might not be able to "make sense" of these experiences from a rigid, western, scientific standpoint, it would be a disservice to rely on cognitive dissonance to dismiss these transpirations as "nothing but noise".

VI. NDE's, The God Helmet, & Deja Vu

One of the more well known phenomena in medical circles as it pertains to an "OBE" is when a patient claims to have seen their body from "up above themselves" during traumatic physiological conditions. This is generally classified as an "NDE" or near death experience.

A 2013 study in the journal Proceedings of the National Academy of Sciences outlined the activity of the rat brain following cardiac arrest (heart attack). The findings were as follows:
"We identified a transient surge of synchronous gamma oscillations that occurred within the first 30 seconds after cardiac arrest and preceded isoelectric electroencephalogram. **Gamma oscillations during cardiac arrest were global and highly coherent**; moreover, this frequency band exhibited a striking increase in anterior–posterior-directed connectivity and tight phase-coupling to both theta and alpha waves. High-frequency neurophysiological activity in the near-death state exceeded levels found during the conscious waking state. These data demonstrate that the mammalian brain can, albeit paradoxically, generate neural correlates of *heightened conscious processing at near-death*."

One of Dr. Rick Strassman's theories as it pertains to DMT synthesis inside the human body is at the moment of death or during severe physical trauma. It appears as though while certain mechanics (meditation/hypnosis + breathing) seem to reliably provide the internal environment for DMT synthesis, there are instances when DMT can be produced without the "priming" of the body. In Q4LT's interview with long-time researcher Dr. Steven Barker, he stated "There is some evidence that DMT is neuroprotective and may play a role in neuronal survival in extreme physiological states."

While this isn't an official study, this excerpt from the book Fear of the Unknown: Enlightened Aid-in-Dying by Arthur S. Berger & Joyce Berger adds additional insight to the "CO2 angle": "There are many other elements that are not like the perceptions during an NDE; nevertheless, Sabon wondered whether the buildup of carbon dioxide in the brain could be the trigger that sets off NDE. Sabom's only documented case in which both blood oxygen and carbon dioxide levels were measured at the time of the patient's cardiac arrest and NDE seems to argue against this because the patient's arterial oxygen level was higher than normal and his arterial carbon dioxide level was lower than normal."

(If we are to remain consistent in regards to our hypothesis of Melatonin acting as a precursor and/or synergistic compound for DMT release in the body/brain, it'd be likely that a significant production/release of Melatonin would take place during the moment of death/"NDE". There are limited studies in regards to Melatonin release at time of death. However, here are a few studies providing support for Melatonin's neuroprotective qualities: Experimental Brain Research (2005), Pediatrics International (2005), Acta Neurochirurgica Supplement (2008), Journal of Veterinary Medicine (2008), Annals of the New York Academy of Sciences (2009), Current Neuropharmacology (2010), Neural Regeneration Research (2014), and Scientific World Journal (2014).)

A 2009 study in the journal Palliative Medicine published findings regarding a surge of EEG activity at time of death in 7 humans. Some of the key findings were as follows: "In each case, loss of blood pressure, as monitored by indwelling arterial line, was followed by a decline is BIS/PSI activity followed by a *transient spike in BIS/PSI activity that approached levels normally associated with consciousness*. This spike in electroencephalogram (EEG) activity had short duration and the activity then declined to a level of activity associated with burst suppression."

While the number of studies in regards to EEG measurement during NDE's isn't extensive, it's intriguing that the few observations appear to correlate with Gamma waves and potentially instantaneous DMT synthesis/release. The anecdotal reports of the experiences during NDE's sound eerily similar to those that describe regular "OBEs", DMT/Ayahuasca sessions, deep states of meditation, and somnambulistic states of hypnosis.

The question regarding NDE's always seems to come down to… was the experience "real"?

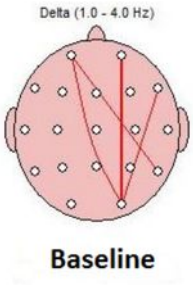
Once again… it appears to boil down to the consistency of interpretation of measurable physiological aspects of the body/brain during these states. We've gone over this in previous chapters. If we are to believe that fragmented brain activity, less global coherence and weaker HZ frequency leads to optimally better functioning for the brain and body (based on measurable parameters), then we can logically discard many of the experiences outlined thus far as unfortunate artifacts of a malfunctioning neurological system.

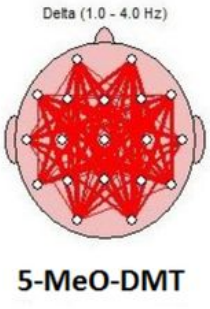
However, if we are to believe that greater brain coherency at a higher Hz frequency coincides with greater optimization of the brain and body (based on measurable parameters), then we must accept some of these experiences as *potentially* greater

truths that have yet to be integrated into our perception of this thing we call “life”… at least from a western, scientific viewpoint. Obviously we would be making this presumption based on the *entire* body of available data/evidence rather than singular occurrences. While many skeptics cite that the “hallucinations” experienced during NDE’s are simply based on idealistic perceptions of the afterlife, Dr. Kenneth Ring published a book titled “Mindsight: Near-Death and Out-of-Body Experiences in the Blind”. This book presents cases of people who have had NDE’s and OBE’s while being blind from birth in which the imagery they experienced is extremely similar to that of people who normal visual function.

One of the subjects, Vicki Umipeg stated, “This was the only time I could ever relate to seeing and to what light was, because I experienced it.”

(This is an image provided by Dr. Juan Acosta-Urquidi from his study on exogenous DMT administration published in The Journal of Natural and Social Philosophy in 2015. While this image showcases the coherence of Delta EEG waves in volunteers who ingested 5-Meo-DMT, Dr. Acosta-Urquidi stated to Q4LT, “With 5-MeO-DMT 9 out of 10 showed the increased gamma coherence effect. With N, N-DMT, *all* subjects showed increased gamma coherence.”)





(We do find it intriguing that the brain coherence and phase-coupling activity seen in the rat “NDE” study up above seems to virtually mimic the coherence and phase-coupling seen in Dr. Acosta-Urquidi’s DMT study.)

One of the more controversial contraptions of recent times is known as the “God Helmet”. It was developed by Stanley Koren (originally the “Koren Helmet”) and neuroscientist Dr. Michael Persinger. It was developed to study creativity, religious experience and the effects of subtle stimulation of the temporal lobes. The apparatus, placed on the head of an experimental subject, generates very weak magnetic fields. Persinger reports that many subjects have reported “mystical experiences, altered states, and a sensed presence” while wearing the “God Helmet”.

A 2004 study published in the International Journal of Neuroscience, showcased an experiment utilizing the “God Helmet”. The findings were as follows: “Only the circumcerebral presentation of the first pulse for 25 ms followed by an acceleration of +2 ms to each of the other 7 solenoids (the last duration = 11 ms) resulted in a *significant increase in power within the gamma range (35 Hz to 45 Hz)* over both frontal and occipital lobes but not over the parietal or temporal lobes. These results suggest topical application of specific spatial-temporal configurations of magnetic fields may affect the recursive creation of the rostral-caudal waves of cohesive fields that might produce consciousness.”

It wouldn’t appear to be a coincidence that there appears to be some correlation between the “God Helmet” experiences which were induced via Gamma Waves in the frontal lobes and the inducement of “lucid dreaming” via Gamma Waves in the frontal lobes as showcased in the journal Nature Neuroscience in 2014.

Those mysterious Gamma Waves rear their heads once again…

Another controversial topic in regards to altered states is people who claim to be “psychic” or have the ability to “communicate with the dead”. This has been an ability that is much maligned in scientific circles based on the inability to quantify how the information is derived. Much of the scientific community presumes that “psychics” are able to specifically maneuver their vocabulary in a manner that seems to be vaguely accurate to the recipient while evading specific truths.

One would presume that a person who has “different” perceptive abilities… whether they be pure “hallucinatory” fabrications or something else altogether would exude significantly different EEG states than the average person.

A 2013 study in the journal Frontiers in Psychology would showcase the brain activity of 6 participants (in a double-blind study) claiming to be able to communicate with the deceased. The results were as follows:

“The correlation between accuracy and brain activity during the 20 seconds of silent mediumship communication was *significant in frontal theta* for one participant. Statistically significant differences at $p < 0.01$ after correction for multiple comparisons in electrocortical activity among the four conditions were obtained in all six participants, *primarily in the gamma band* (which might be due to muscular activity). These differences suggest that the impression of communicating with the deceased may be a distinct mental state distinct from ordinary thinking or imagination.”

“To conclude, we believe the results for Medium 1, correlating accuracy with electrocortical activity, qualify as a robust finding. The results regarding differences in gamma power bands between different mental states remains puzzling as the gamma difference we observed seems to arise, at least in part, from eye or muscular activity. The characterization of the exact nature of this difference in the gamma frequency band, and assessing whether any of this activity originates from the brain, calls for additional research. Taken together, the study’s findings suggest that the experience of communicating with the deceased may be a distinct mental state that is not consistent with brain activity during ordinary thinking or imagination.”

The researchers appeared to have difficulties deciphering whether Gamma EEG spikes were correlated with eye or muscular activity vs. surges of the brain. The one eye-opening finding from the study was that one participant (Medium 1) appeared to be a more accurate “psychic” than the rest of the group. The fact that Medium 1’s significant accuracy correlated with specific electrocortical activity is rather logical.

In Chapter 1, we outlined the 2008 study in the Journal of Neuroscience that showcased Gamma Waves as high as 250 Hz during REM sleep that coincides with slower wave states (Theta/Delta). A 2006 study in the journal Science states the following in terms of the Theta/Gamma relationship:
“We observed robust coupling between the high- and low-frequency bands of ongoing electrical activity in the human brain. In particular, the phase of the low-frequency theta (4 to 8 hertz) rhythm modulates power in the high gamma (80 to 150 hertz) band of the electrocorticogram, with stronger modulation occurring at higher theta amplitudes. Furthermore, different behavioral tasks evoke distinct patterns of theta/high gamma coupling across the cortex. The results indicate that transient coupling between low- and high-frequency brain rhythms coordinates activity in distributed cortical areas, providing a mechanism for effective communication during cognitive processing in humans.”

While the researchers in the 2013 psychic study up above had difficulties deciphering legitimate Gamma wave spikes from muscle/eye movements, there are periphery studies that showcase a “coupling” between Theta & Gamma waves. This leads us to believe that Medium 1 from the experiment is likely producing this “coupling” effect during accurate recall of information regarding the deceased. This would mean that the mysterious Gamma Waves appear to coincide with “psychic” ability.

This obviously leads to further questions such as… if some people have the ability to “communicate with the dead”, what does that say about the process of dying? What does that say about the process of living?

While communication with the deceased appears to be a rare occurrence amongst the general population, the “psychic” experience of Déjà vu appears to be much more common by comparison. The term Déjà vu means “already seen” (in French). It is the phenomenon of having the strong sensation that an event or experience currently being experienced has already taken place in the past. It’s a strange occurrence of perception that up to 97 percent of the population has reported having at least once in their lifetimes.

In 2014 the journal Neuroscience and Behavioral Physiology published a study regarding EEG activity in 166 subjects (139 healthy volunteers & 27 with epilepsy) who reported having “Déjà vu” experiences. The results were reported as follows: “On the EEG, the phenomenon of Déjà vu was characterized by onset with *multi-spike* activity in the right temporal leads, and in some cases, ended with slow-wave activity (Theta/Delta) activity in the right hemisphere.

Based on browsing the general definitions of "multi-spike” and “polyspike” as they pertain to EEG patterns, it seems as though they signify “very fast waves” that occur in consecutive bursts. While the language in the study above doesn’t specify that Gamma waves precede the Theta/Delta activity in Déjà vu subjects, it appears as though there *is* a correlation between Gamma waves and Déjà vu occurrences.

The formal scientific stance regarding Déjà vu is that it occurs based on the belief that images from one eye is delayed, arriving in the brain microseconds after images from the other eye. This subsequently causes the sensation that something was being seen for the second time. This is referred to as the Optical Delay Pathway Theory. In essence, it’s a “misfiring” of the brain that leads to this dissociated-type of experience.

This theory appeared logical to the scientific community until 2006 when a study published in the journal Brain and Cognition outlined the observation that a healthy, 25 year old male who was blind from birth experienced Déjà vu regularly. Here is an excerpt from ScienceDaily regarding how the man experienced Déjà vu:
“But University of Leeds researchers report for the first time the case of a blind person experiencing déjà vu through smell, hearing and touch. The University is a world-leader in déjà vu research. The ground-breaking work of the University’s Institute of Psychological Sciences has been widely published in both the scientific and the news media. Their work is particularly aimed at understanding chronic déjà vu, where patients are constantly plagued by the feeling of having "been here before”.

In a new paper published in the journal Brain and Cognition*, researchers Akira O'Connor and Chris Moulin relate how mundane experiences – undoing a jacket zip while hearing a particular piece of music; hearing a snatch of conversation while holding a plate in the school dining hall – were examples of how deja experiences were triggered in the blind subject.“
-

Much of these transpirations cannot be logically explained utilizing basic scientific theories. Some will cite "Quantum” aspects as “proving” the possibilities but that is not our field of interest nor discussion. The one thing that we do believe is explainable is that OBE’s, NDE’s, “The God Helmet”, Psychic phenomena, and Déjà vu all appear to have Gamma waves and potentially endogenous DMT synthesis in common.

VII. “Supernormal” & Wim Hof

So far we’ve covered quite an array of topics that seem to coincide with Gamma Waves and potentially endogenous DMT synthesis.
We have “Aha!” moments, lucid dreaming, sleep paralysis, electrically induced lucid dreaming, “Out of Body Experiences”, REM Sleep, meditation, deep hypnosis (& subsequent anomalistic effects), “Past Life Recollection”, hypnagogia, “Near Death Experiences”, Deja Vu, “Psychic Mediumship”, & “The God Helmet” experiences. We’ve also included the EEG findings from Ayahuasca administration as well as DMT ingestion.

Let’s continue down the bunny hole of analyzation of commonalities amongst the “supernormal”… “paranormal”… or whatever you’d like to label it as.

Like we stated in previously, the creator of the original EEG machine was a man named Hanz Berger. He developed the device in order to quantify what he believed to be the ability of humans to communicate “telepathically”. He failed to succeed but as stated previously, we believe that it might coincide with the inability of analog EEG devices to measure brain waves above 25 Hz (Gamma).

The controversial potential of “telepathic” communication is the fact that it might change what mainstream science “knows” about the origin of consciousness. The subject also causes us to ask deeper questions about what we understand about outside electromagnetic influences on the brain and behavior. About 8 months ago Q4LT attempted to project the biological parameters for optimal conditions for successful “telepathic” transfer.

A 2008 study in the International Journal of Yoga outlined the brain imaging of a man named Gerard Senehi during “Telepathic” transfer between himself and another subject. The results was as follows: “The mentalist demonstrated significant activation of the right parahippocampal gyrus after successful performance of a telepathic task. The comparison subject, who did not show any telepathic ability, demonstrated significant activation of the left inferior frontal gyrus.”

Another study in 2012 in the International Journal of Yoga would verify whether a different person, a man named Sean Harribance would showcase the same neural correlates with “psychic” ability compared to the 2008 study. The results were as follows:

“The raw data from the unique electroencephalographic pattern displayed by Sean Harribance during his intuitive state revealed a peak increase of power within the *upper beta* range (20-30 Hz) within the right parahippocampal region only. The congruence of the region of activation during “telepathy” by Sean Harribance and Gerard Senehi, especially when the specific electromagnetic and cellular characteristics are considered, suggests the parahippocampal region may be a focus for exploration of the mechanisms by which these phenomena might occur.”

This would appear to be rather intriguing results based on two findings.

The first one is that the right parahippocampal gyrus area was activated during successful “telepathy” in Mr. Senehi as well as “psychic mediumship” in Mr. Harribance.

The second one is that the 2012 study showcased Mr. Harribance as having showcased an “upper beta” range during his psychic performance. Being that we’ve outlined the initial limitations of analog EEG machines (limited to less than 25 Hz) compared to digital EEG machines Chapter 1, as well as the propensity for different researchers to label waves between 25 and 35 Hz (interchanging Beta for Gamma & vice versa) based on personal preference, we believe that “upper beta” can easily be interchanged for “gamma” or “lower gamma”. Many researchers will label 25 Hz and above as simply “Gamma”. (We’ve seen this in the earlier study regarding electrically induced “lucid dreaming” as well as studies published in the Public Library of Science, Frontiers in Human Neuroscience, Conference Proceedings of the IEEE Engineering in Medicine and Biology Society, Cognitive Processing, Frontiers in Human Neuroscience, Frontiers in Integrative Neuroscience, and Neuron.

There appears to be a lack of consistency in the labeling of the 25 to 35Hz range among EEG researchers.

In fact, when looking at the most recent categories added to the spectrum of EEG analysis, it appears as though numerous labels have been added to the original 4 (Delta, Theta, Alpha, Beta):

“Infra-slow Oscillations”, (Less than 0.1 Hz)
“Epsilon Waves” (Less than 0.5 Hz)
“Mu wave” (9 to 11 Hz)
“SMR Wave” (13 to 15 Hz)
“Beta 1” (12 to 15 Hz)
“Beta 2” (15 to 20 Hz)

“Beta 3” (20 Hz to 26 Hz)
“Hi-Beta” (26-32 Hz)
Hyper-Gamma (Greater than 100 Hz)
Lambda Waves (Greater than 200 Hz)

To add to the amusement of our society’s incessant need to label and compartmentalize everything, the consistencies amongst the HZ range for many of these “sub-labels” seem to… once again vary according to personal preference of the researcher.

Digression is rearing itself once again… let us continue.

While some of the concepts presented in the earlier parts of this series seem rather straightforward and palatable (“Aha!” moments, REM Sleep/Lucid Dreaming, meditation), some of the latter concepts such as “psychic mediumship”, growth stimulation from hypnosis, “past life recollection”, and “telepathy” would make the average skeptic squeal with contempt. I don’t blame them as much of what we are discussing isn’t exactly embraced by *mainstream* scientific circles. Much of the cited studies/concepts leads us to develop questions past our own biology/physiology and beliefs as to what humans are and are *not* capable of.

While much of the focus of this discussion has been in regards to the EEG state during many of these “supernormal” moments, there appears to be a likelihood of correlation (direct or indirect) as it pertains to the general respiration rate of the subjects. It’s generally well-known that much of the focus of many meditative practices has to do with a variation of rhythmic, breathing exercises. We’ve also outlined the biological parameters and benefits of sleep, breath rate, and the dream state in the piece titled “Sleep, Melatonin, & DMT”. A 2010 study in the journal Advances in Experimental Medicine and Biology quantifiably documents the increased breath rate during REM sleep.

In 1991, the journal Electroencephalography and Clinical Neurophysiology published a study in regards to EEG measurements of induced hyperventilation aka respiratory alkalosis. The conclusion was as follows: “Hyperventilation caused an exponential *increase in slow activity* and a decrease in alpha power. Blood flow velocity was decreased by hyperventilation but increased by hypoxia. It is concluded that the EEG changes observed during hyperventilation must mainly or totally be attributed to factors other than cerebral hypoxia.”

In 1992, the journal Electroencephalography and Clinical Neurophysiology published a study comparing the effects of Indomethacin vs. hyperventilation-induced reduction in cerebral blood flow with EEG analysis. The study concluded: “In the hyperventilation group the blood flow velocity decreased to 63% of the initial value and the qEEG showed a marked *increase in delta and theta activity*, but a non-significant change in alpha peak frequency. Indomethacin and hyperventilation caused similar degrees of vasoconstriction; however, the increase in qEEG slow wave activity, which was observed only in the hyperventilation group, is apparently related to metabolic rather than haemodynamic factors.”

(The significance of these two EEG studies in regards to hyperventilation (respiratory alkalosis) is the fact that slow wave (Theta/Delta) activity increased as a byproduct. When you combine this with the observation of slow wave modulating fast wave (Gamma) activity (examples: 1 & 2), it leads us to believe that there is an apparent feedback loop between breath rate and EEG state.)

While the term “hyperventilation” generally seems to have negative connotations, deep rhythmic breathing such as that observed during REM sleep and meditation can appear to offer undeniable positive physiological benefits for both the brain and body.

One practitioner who is utilizing deep, rhythmic breathing in an undeniably “supernormal” manner is 26 Guinness World Record Holder, Wim “The Iceman” Hof. He has shown extraordinary abilities when it comes to withstanding extreme cold climates. According to the “Iceman”, he utilizes the power of his mind via meditation and breathing techniques in order to “control his internal thermostat”. In 2009, Wim would climb Mount Kilimanjaro in Tanzania (19,340 feet above sea level) in just two days. In 2009, Wim would also complete a 26 mile marathon above the arctic circle in Finland, (temperatures averaging −4 °F) while dressed in nothing but shorts. He completed the marathon in 5 hours and 25 minutes.

Not to be limited to cold challenges, in 2011 the “Iceman” would complete a 26 mile marathon in the Namibian Desert (104 °F) without drinking any water. While this would be considered very dangerous for most people due to the likelihood of one’s core body temperature overheating leading to hyperthermia and septic shock, Wim’s core temperature would remain the same throughout the marathon.

In 2014, the Proceedings of the National Academy of Sciences published a paper on the effects of the “Wim Hof Method”. The study itself comprised of 24 volunteers in which 12 of them would train for 10 days utilizing Wim’s techniques such as “Third Eye

Meditation", cold immersion, and cyclic hyperventilation followed by breath retention. The other 12 volunteers would not undergo any training at all. The study was based on observing the physiological differences in both groups after having been administered the endotoxin known as E. Coli. The results were as follows: **"Hitherto, both the Autonomic Nervous System and Innate Immune System were regarded as systems that cannot be voluntarily influenced. The present study demonstrates that, through practicing techniques learned in a short-term training program, the sympathetic nervous system and immune system can indeed be voluntarily influenced."**

"Finally, flu-like symptoms were lower in the intervention group. In conclusion, we demonstrate that voluntary activation of the sympathetic nervous system results in epinephrine release and subsequent suppression of the innate immune response in human in vivo. These results could have important implications for the treatment of conditions associated with with excessive or persistent inflammation, such as autoimmune diseases."

Being that hyperventilation leads to respiratory alkalosis which coincides with suppressed carbon dioxide (CO_2) levels which is labeled Hypocapnia (neurotic labeling rears its head once again), it brings us back to the Melatonin($C_{13}H_{16}N_2O_2$) and DMT($C_{12}H_{16}N_2O$) relationship. We've gone over this extensively in the pieces "DMT, Melatonin, & Miracles", "Sleep, Melatonin, & DMT", and "DMT Making 101".

(General consensus across mainstream medical circles is that both the arterial blood pH and venous blood pH are supposed to remain within a tight bandwidth between 7.35 to 7.45. Any shift or change in blood pH out of these "acceptable" parameters is considered abnormal and even dangerous. However, it's interesting to note that in looking at the chart down below, the arterial blood pH of the Wim Hof trained group would rise as high as 7.75.)

	Start	End hyperventilation	End retention	End hyperventilation	End retention	End hyperventilation	End retention
pH	7.40	7.66	7.44	7.67	7.46	7.75	7.50
pC02 (kPa)	4.49	2.11	4.01	2.03	3.76	1.69	3.48
pO2 (kPa)	16.5	22.0	5.6	22.9	4.8	22.6	3.4
HCO3- (mmol/l)	20.9	18.0	20.3	17.6	20.2	17.4	20.4
Lactate (mmol/l)	0.69	0.86	0.69	1.03	0.77	1.16	0.91

Fig. 2. Cardiorespiratory and biochemical changes during cyclic hyperventilation and breath retention in a representative subject of the trained group.

This indicates that the Wim Hof trained practitioners are releasing significant levels of carbon dioxide (CO2) from their body during their feats. Although there have yet to be any scientific studies whether Wim is synthesizing DMT endogenously via his methodologies of breathing and meditation, the anecdotal reports from practitioners of the "Wim Hof Method" appear to be rather convincing that at a *minimum* there are likely trace amounts of DMT being produced from these exercises. (Of course we are making this hypothesis based on all the data presented in previous chapters.)

In 2013, an article in the Journal of Neural Transmission postulates the following as it pertains to DMT and respiration/lungs: "Based on the available evidence, we speculate that DMT functions in the following manner. In response to a life threatening situation or the physical signals of agony, the lungs can synthesize large amounts of DMT (by quick removal of the endogenous dialyzable INMT inhibitors without the need of new enzyme synthesis) and release it into the arterial blood within seconds. Once DMT enters blood circulation, it is relatively safe from degradation since extracellular, circulating monoamine oxidase enzyme deaminate only primary amines (McEwen and Sober 1967). Therefore, the tertiary DMT is not a substrate for plasma monoamine oxidase and can reach the brain with minimal degradation."

(These are just 7 anecdotal reports from practitioners on the WHM group on Facebook (the blog provides screenshots of the posts, in this PDF we will provide their reports in quotations. The names and pictures have been omitted to respect their privacy). We must remain cognizant that much like in Dr. Rick Strassman's trial chronicled in his book DMT: The Spirit Molecule, different levels of DMT lead to different experiences. The "lowest dose led to a euphoric feeling with no hallucinogenic properties while the highest dose led to transcendental experiences.)

"Right this is gonna sound weird, but I was doing some breathing in the shower (nb: you are only advised to do it later in the course) and closing my eyes as I held. Well for a moment, I saw this complex geometric shape, like a chrysanthemum, or something more hexagonal/star like. The definition of it was like, higher definition than real life, the image was so sharp. It was kind of overwhelming and I opened my eyes. Anyone got any ideas what this might be or mean, if anything?"

"Question on boosted energy and good feelings using WHM. I have been doing WHM for a while now and never felt any boost of energy/good feelings after the WHM. I would only feel happy/calm as I was doing the exercises. The other day I did the WHM and felt really great. It inspired me to go out for a walk and I felt absolutely amazing. That sounds like the experience people were getting from WHM. However, it only happened that one time and now when I do the breathing I do not get that feeling/boost of energy. ANyone go through something similar?"

"Today I was doing my breathing rounds and after the 3rd one I had the weirdest experience I've had which many of you might be familiar with - during retention I seemed to have gone somewhere, when I looked at the stopwatch it was 3:30 and I didn't feel I needed any breath, I was calm as calm can be beyond everything. I stopped retention as I have never been in this space before, I didn't plan it. How far do you go if you get into this space of beyondness? Thanks in advance for sharing your experiences."

"Day one, week 3. On the third retention I saw the lights. It was like they were on the corners of a square and the brightest LED lights ever. But VERY far away. On the fourth retention, I "came to" in a very calm state in light. At some point I had stopped the timer on my phone, but had no recollection. Really powerful moments. Wanted to share."

"Nice to report a little success for me. I have been going on small cold runs (only shorts and shoes in subzero conditions) for a few months now. I have been building up my

tolerance gradually. My greatest challenge has always been my fingers. Today I ran 4.5 km in -6 C and at the end of the run my hands were fine! I have practised again and again visualizing sending heat to my hands. Today it seemed to work. What helped was also imagining that my hands were covered in warm gloves. The power of the mind is amazing!"

"After a few rounds I feel about the same as I do on low dose psilocybin, it's very clear and razor sharp, fear is also extremely diminished. / Yes I did 40 minutes of breathing rounds and very psilocybin like which is pretty much low level dmt anyway, virtually indistinguishable. So much potential especially when accessing to deeper levels with stroboscope which I only have glimpses, often on psychedelics we make the mistake thinking it's "out there" when really we may be swimming in our cells which are gateways wormholes to other dimensions inside themselves, the features of dmt scapes appear to contain a lot of the elements in cell anatomy. / I microdose quite frequently either psilocybin or San Pedro Cactus and I've done small doses of ayahuasca even, it appears that they all at low levels are virtually the same. The set and setting are huge. I only use it with an intention, I have to have a reason, I don't just take them to chill unless it's a big dose and I got a babysitter lol."

"I am pretty familiar with DMT myself and the experience I had on the 4th day definitely felt like a DMT trip but without the insane visuals lol. I had no idea it was possible to feel that good without outside sources"

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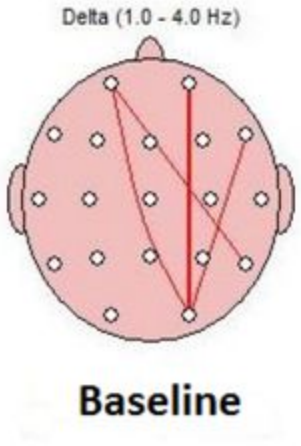
While DMT is traditionally considered to be a "hallucinogenic" compound, if it is produced during the "Iceman's" feats as well as those of his practitioners, it could lead to the recategorization of the compound altogether. Seeing something that is "not there" is one thing… being able to perform significantly measurable, "abnormal" & "supernormal" feats during the synthesis of a compound is something else altogether. Perhaps this is one of the ways "nature" intended DMT to be accessed?



(The above image was provided by Dr. Juan Acosta-Urquidi from his study on exogenous DMT administration published in The Journal of Natural and Social Philosophy in 2015. The same coherence was observed across Gamma bands as well. DMT appears to signify a "Lucy" type of effect on brain coherence.)

In 2012, the journal Psychosomatic Medicine published a study on Wim Hof's physiological measurements from being fully immersed in ice for 80 minutes as well as his biological reaction to endotoxemia administration.

Q4LT reached out to the scientists who conducted this study and received additional information from a document titled "Supplementary Digital Content". The information we were looking for was specifically as it pertained to the EEG data of Wim Hof. It is as follows:

"The EEG showed normal cortical background activity at baseline, with an occipitoparietotemporal alpha rhythm of 8.8 - 9.3 Hz. During the first 4 hours of the

experiment, including baseline, LPS (lipopolysaccharide derived from E. Coli) infusion and meditation period afterwards, there were no signs of encephalopathy (degeneration in brain function), nor a drop in vigilance shown as either drowsiness or sleep. During the subject's' concentration/meditation cycle, short periods (10-15s) of focused attention were found in the EEG, reflected by a disappearance of the occipiotparietal alpha rhythm and diffuse irregular beta frequencies associated with cognitive activity. Quantitative EEG showed no relevant changes during the sample periods."

"EEG Analysis: EEG was determined using a standard 21-lead recording with surface Ag/AgCl cup electrodes as described previously (2,4). The full-length recording was analyzed visually by an experienced clinical neurophysiologist (NvA) and scored using a five category classification system for septic encephalopathies. Additionally, EEG background activity was monitored during concentration/meditation and the presence of drowsiness or sleep was noted, as were signs of shivering indicated by the presence of tremorous muscle activity artifacts at both the scalp and chest electrodes. For further quantitative analysis at least once per 30 minutes a one-minute artifact free raw EEG sample (10-second epoch) of the subject lying awake with his eyes closed was selected."

The most interesting take away from the presented notes of the study was the fact that for 10-15 seconds the alpha waves would disappear to be replaced by "irregular beta frequencies associated with cognitive activity".

Based on all of the information that we have looked at thus far as it pertains to the huge Gamma Waves generated by long-time meditators, during REM sleep, and during hypnosis… it wouldn't be surprising whatsoever to find out that the "irregular beta frequencies" were in fact waves in the 25 to 35Hz range (or greater) which could easily be characterized as Gamma waves. This is just speculation based on what we believe to be an "educated hypothesis".

It'd be likely that a more extensive EEG focused study would need to be designed for Wim Hof to showcase precisely what type of brain waves are being generated by him during his feats. While it's no secret that the "Iceman" is a long-time practitioner of meditation and yoga, it'd be *very surprising* to see that he does *not* generate Gamma waves comparable to that of other long-time meditation practitioners. It seems as though the EEG data from the 2012 study was predominantly focused on observing potential encephalopathy (degeneration of brain function) due to E. Coli administration.

The intriguing narrative that the “Iceman” consistently touts is that he is not the first person in the world to display these types of abilities… he states that he just so happens to bring these abilities to the scientific setting with open arms. It is our opinion that the studies regarding Wim Hof and the “Wim Hof Method” are one of the most significant of the recent, modern era as it showcases “supernormal” feats that can be replicated amongst the general public in 2016. While the current studies regarding “WHM” have focused on cold immersion and consciously influencing one’s own immune system, it’d appear that the internal physiological commonalities with much of the phenomena discussed in previous chapters lead us to believe that there is much more to be brought to light within the scientific setting. We believe that Wim is a pioneer in bridging the gap between what once was deemed as purely “esoteric” and bringing it into prominent scientific discussion.

We must remain cognizant that science deciphers mechanisms… it doesn’t create, *especially* when it comes to human physiology. Since Mr. Hof is not the first to display specific, never before observed abilities in a scientific setting… it leads us to ask the question, what else is there?

Could the observations outlined in the previous parts of this series be true? If so, how much deeper does the rabbit hole really go?

VIII. Wild Theories Part 1

It's been quite the ride thus far with the topics covered and the studies cited.
It appears as though a few additional fields of discussion could have been touched upon but the scientific literature as it pertains to EEG data in regards to those topics are limited at best. However, being already "knee deep" in the field of the "supernormal", we will touch upon a few eye-raising topics in the second half of this piece.
Let's touch upon a few points/theories that we believe are key takeaways from this the earlier chapters. Some of them will be considered to be "way out on a limb" in terms of speculation while others would be considered a bit more modest.

1. Subconscious to Superconscious?
There appears to be a "rubber band-effect" when it comes to predominant brain wave states. What we mean by this is that the slower the dominant wave becomes, the greater the potential of the faster spike/state during "coupling". In essence, the farther you pull the rubber band into the relaxation brainwave (Theta/Delta), the faster and higher it will snap into the Gamma wave spikes. This observation is based on the following points:
A. "Aha!" moments of insight in which (40Hz) Gamma waves were immediately preceded by a short burst of Alpha waves (8-12 Hz).
B. The study published in the Journal of Neuroscience citing "phase-coupling" between Theta (4-8 Hz) and Gamma (50-150 Hz).
C. The method of inducing hypnagogia described in the Thomas Edison case and the projected slow wave spike that preceded the "insight".
D. The REM sleep study which showcased Theta/Delta waves coinciding with Gamma Waves spikes in the 250 Hz range.

This would lead us to believe that one might experience deeper, more profound insights in a specific arena of thought if the mind is cleared, relaxed, and passively focused. We postulate that if one were to reach a 6 Hz level (Theta) of relaxation, they would likely spike into a higher Gamma Hz than if one were to only reach a 10 Hz level (Alpha) of relaxation. The higher spike would correlate with more robust, new neural network pathways forming as it pertains specifically to that idea/concept. In reading much of the material relating to hypnosis, it is cited that it is the "subconscious mind" that is largely accessed during slower EEG states. However, it appears as though moments of profound insights correlate with moments of "super consciousness" that appear to coincide with Gamma waves. This is just a theory… somewhat.

2. Egg or the Bird?
Do Gamma waves lead to DMT synthesis or does DMT synthesis lead to Gamma waves? From most of the observed studies and physiological states, there appears to be a correlation with endogenous DMT synthesis and elevated Melatonin levels via slower EEG states coupled with suppressed CO2 levels via a generally relaxed/rhythmic respiration rate, intermittent fasting, & atonia of the muscles (body stillness) . These parameters would also appear to coincide with the eventual formation of Gamma waves during the observed states of sleep, meditation, hypnosis, etc.

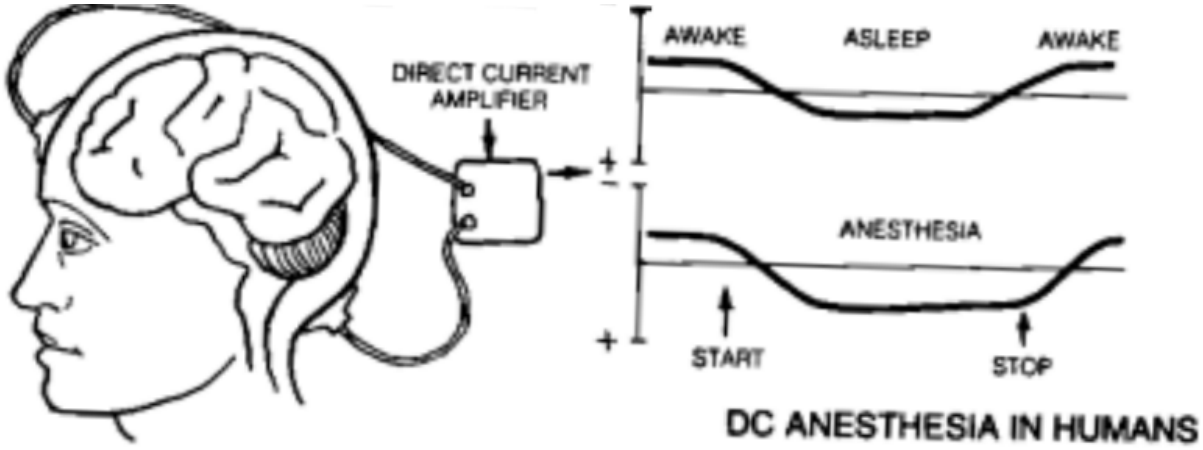
However, when it comes to electrically induced lucid dreaming, “The God Helmet” experience, and “NDE’s”, it appears as though not all “altered states” require priming of the body via the described biological parameters. It seems as though a specific frequency of electrical stimulation either via an external source or physical/emotional trauma can invoke transcendental experiences as well. This leads us to believe that analyzing the body from a perspective slightly different than predominantly traditional biology can possibly provide some answers.

3. The Body Electric/The Brain Electric
In Dr. Robert O. Becker’s book, “The Body Electric” he states the following as it pertains to observations regarding electrical current alterations in the brain coinciding with different states of consciousness:
“We immediately found that the back-to-front current varied with changes in consciousness just as in the salamanders. It was strongest during heightened physical or mental activity, it declined during rest, and it reversed direction in both normal sleep and anesthesia.”

“One of the most exciting results of my collaboration with Dr. Friedman was proof that one’s state of waking consciousness could change the perception of pain. Friedman, who already used hypnosis to control chronic pain in his patients, gave several of his best subjects hypnotic suggestions of arm numbness deep enough that they couldn’t feel the prick of a needle. In each case, I found that the frontal negative potential of the head became less negative, often reaching zero, as the client attained deep trance. The reading changed in the same direction as in anesthesia, only not as far.”

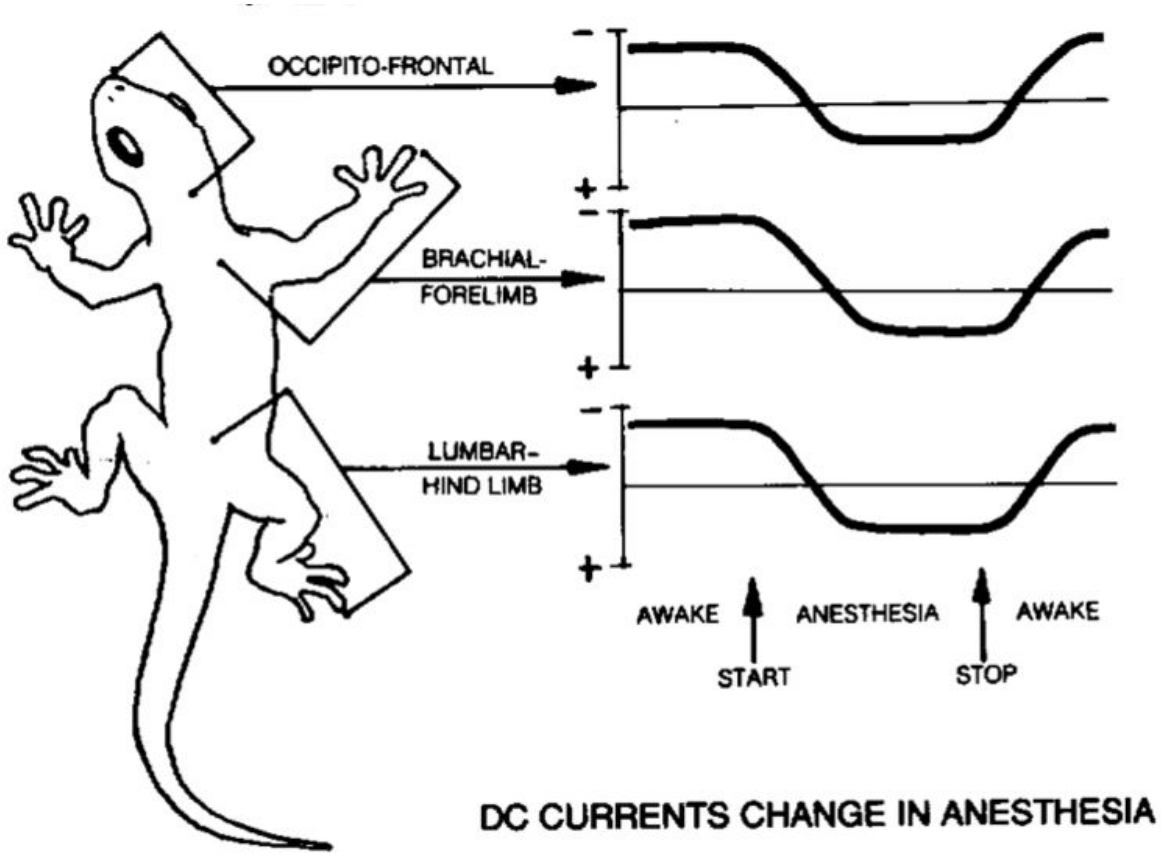
“Negative potentials in the brain’s frontal area and at the periphery of the nervous system were associated with wakefulness, sensory stimuli, and muscle movements. The more activity, the greater the negative potentials were. A shift toward the positive occurred during rest and even more so during sleep.”

(DC shift in human brain)



If direct current (DC) shift in the brain coincides with sleep (to a lesser extent hypnosis/meditation), and sleep/dreams correlate with endogenous DMT release, how does this reverberate throughout the body… electrically speaking? Perhaps the shift in DC direction in the brain coincides with the simultaneous increased production of endogenous DMT? Maybe this directional shift in electrical signaling within the brain is the basis for the Wim Hof Method and subsequently the “supernormal” abilities to influence electrical signaling throughout one’s body?

(DC shift in salamander brain coincides with DC shifts in limbs)

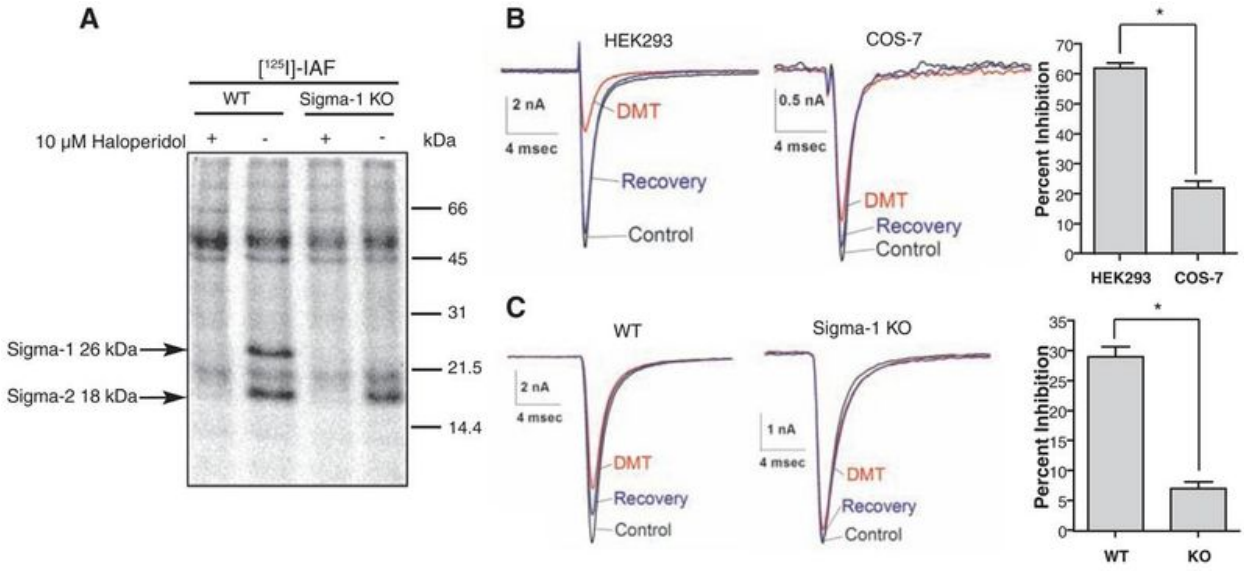


It's rather well known that "pure" water (deionized or distilled) does not conduct electricity. However, when an ionic compound such as sodium chloride (salt) is added to this purified water, the water becomes capable of electrical conductivity. The higher the concentration of sodium chloride in the water, the greater the electrical conduction capabilities of the liquid. When I tend to think of the human body in terms of electricity, it would appear somewhat reasonable that a shift or change in electrical current/capacity would likely coincide with some form of alteration in terms of sodium/chloride measurements in the blood/CSF on an intracellular/extracellular level.

A 1997 study in the journal IEEE Transactions on Biomedical Engineering states the following: "Modelers of electrical sources in the human brain have underestimated human CSF conductivity by as much as 44% for nearly two decades".

This isn't surprising based on the greater concentrations of sodium and chloride in the CSF compared to blood. A 2013 study in the journal Science outlines the mechanisms of increased CSF influx into the brain during sleep. A 2015 paper in Experimental Neurology states "Recently human CSF has been shown to be in dynamic flux with heart-beat, posture and *especially respiration*."

Is it a coincidence that a high percentage of the human and even general mammalian population experiences “dreams” at a time when CSF influx is as it’s highest in the brain and rhythmic breathing has been taking place for prolonged periods of time?
In 2009, a study published in the journal Science stated the following as it pertains to DMT and sodium: “DMT acts as a hallucinogen, but its receptor target has been unclear. DMT bound to sigma-1 receptors and inhibited voltage-gated sodium ion (Na+) channels in both native cardiac myocytes and heterologous cells that express sigma-1 receptors.”



Q4LT would then send an inquiry to Dr. Meyer Jackson regarding the meaning of this finding as it pertains to the inflow or outflow of sodium in regards to these cells. We received the following answer: “In 2009, The American Journal of Physiology - Cell Physiology published a paper that answers your question (specifically Fig. 2B). It shows a similar degree of inhibition for both inward and outward Na (sodium) current, both above and below the Na (sodium) reversal potential.”

We’ll be stepping a bit outside of our comfort zone with this “wild speculation” but it appears as though the depolarization of the neuronal membrane via sodium influx might utilize DMT as a “trap door” or “gatekeeper of voltage” to halt both the inflow and outflow of sodium to keep instantaneous repolarization from occurring. This would then appear to lead to a sustained sodium shift level which would manifest itself as Gamma waves via EEG measurement. We’ll refrain from making any other crazy statements in regards to this but the general idea is that while DMT is considered a hallucinogen, it appears as though DMT might also signify a distinct shift in sodium/electrical capacity within the brain’s CSF which then causes perception changes.

Perhaps we can even contemplate the similarities between a single neuron that undergoes the process of depolarization and the entire brain undergoing a similar process as the positive charge shifts from the back of the brain to the front of the brain via sodium flow. Instead of repolarization taking place so that the normal resting state is realized and DC direction remains unchanged in the brain, DMT is released/produced to keep a sustained level of depolarization in which the front of the brain remains positively charged during sleep and to a lesser extent hypnosis/meditative states. It's rather intriguing that the 2009 study in the Journal of Palliative Medicine in regards to EEG activity during time of death cites the following: "We speculate that this level of BIS/SEDline activity is related to the cellular loss of membrane polarization due to hypoxemia. We further speculate that since this increase in electrical activity occurred when there was no discernable blood pressure, patients who suffer "near death" experiences may be recalling the aggregate memory of the synaptic activity associated with this terminal but potentially reversible hypoxemia."

A 1992 study published in the journal Electroencephalography and Clinical Neurophysiology outlined the effects of hyperventilation in terms of EEG changes as well as reducing cerebral blood flow due to vasoconstriction. A 1989 study in the Journal of Neurology, Neurosurgery, and Psychiatry showcased the correlation of increased CSF volume in the brain as a result of hyperventilation.

From what it appears, the lungs/respiration rate act as a pump that pushes CSF into the brain while cycling blood out of the brain simultaneously.

(It's interesting to note a 2001 paper published in the journal Spine that outlines the CSF volume changes in the lumbar (lower back) from hyperventilation and abdominal compression. The results were as follows: "The volume change (10% reduction in volume with hyperventilation, 28% with compression, and 41% with combined hyperventilation and abdominal compression) is directly visualized to be caused by engorgement of the epidural venous plexus, compressing the thecal sac." It's interesting to note that CSF volume in the lower back decreases from hyperventilation while it appears to increase in the brain. Perhaps this is the physical correlate of "rising spiritual energy" cited by the esoteric practices of meditation? It could be the rising/shifting of CSF from the lower spine into the brain which subsequently leads to the transcendental experiences associated with DMT. It's also interesting to note that abdominal compression could correlate with sitting "cross legged" on the floor which appears to enhance the reduction in CSF of the lower back which might correlate with increased CSF entering the brain. Maybe there is some physiological correlates with this

“meditation/energy thing” that can be quantified from a CSF volume shift/electrical perspective?)

Sounds like nonsense? Maybe it is… all I know is that *something* electrically is likely happening between a person’s ears during DMT/Gamma wave experiences.

4. Brain hemispheric coherence… optimization or overclocking?
While the data from the study undertaken by Dr. Juan Acosta-Urquidi clearly showcases the coherence across both hemispheres of the brain from external DMT administration, we have yet to dig deep into whether brain coherence is taking place in all of the “altered states” mentioned. It appears rather clear that the right hemisphere of the brain is predominantly accessed in these states but hemispheric coherence is the most intriguing possibility in our eyes.

In 2009, Dr. Pascal Fries would publish a paper in Annual Review of Neuroscience titled “Neuronal Gamma-band synchronization as a fundamental process in cortical computation”. One of the intriguing aspects of the write-up was as follows: “This segmentation and selection can be elegantly achieved if structural connectivity interacts with neuronal synchronization. I propose that this process is at least one of the fundamental functions of gamma-band synchronization, which then subserves numerous higher cognitive functions.”

Q4LT reached out to Dr. Fries in regards to this and received the following answer: “The gamma-band synchronization that I refer to can be found in both the left and the right hemisphere. When stimulation and task conditions are appropriate, the synchronization can also exist between hemispheres.”

Dr. Fries would also respond with a copy of his most recent findings titled “Rhythms for Cognition: Communication through Coherence”, published in the journal Neuron Perspective in 2015. Some intriguing additional insight in regards to Gamma Waves & interhemispheric coherence can be found in the Annual Review of Neuroscience in 2012.

When we dissect all of the info as it pertains to the Corpus Callosum’s correlation with increased intelligence and its definitive role in communicative signals between the left and right hemispheres of the brain, we can conservatively postulate that hemispheric cohesion would lead to a more optimal state of brain operation versus a lack of cohesion. The question is whether a person can sustain hemispheric cohesion across multiple bands of brain waves while maintaining their “normal” level of perception. If yes,

does it allow them to tap into “greater” faculties at will? If not, what does that say about the nature of these states?

Utilizing consistent logic in terms of the positive hormonal fluctuation and physiological changes during meditative & sleep states which are projected to coincide with endogenous DMT production, it would outwardly appear that hemispheric synchronization correlates with an optimization of the body and likely the brain as well.

5. Spiritual Guru “Hands on the Head” Mystical Experiences

While we’ve already outlined the study of electrically induced lucid dreaming and the “God Helmet” experiences, an interesting phenomena that has been touted anecdotally throughout the ages is when the spiritual “guru” places their hands on a person and the person subsequently has a transcendental experience. In some cases, the person even claims to have been miraculously healed from a chronic ailment by this occurrence.

While much of these reports have been discarded as pure fallacy of the mind, when crudely observing the electrical current directional shift in the brain and body during altered states of consciousness, it opens up the potential of the possibilities.
In 1994, the Journal of Neurological Sciences published a study outlining the effects of specific electromagnetic frequencies on the human brain. The results were as follows: “The effects of 1.5- and 10-Hz electromagnetic fields (EMFs), 0.2-0.4 gauss, on the intrinsic electrical activity of the human brain at these frequencies was studied. Each of 19 subjects exposed for 2-sec epochs exhibited altered brain electrical activity at the frequency of the EMF during the time of stimulation, as determined by spectral analysis of the electroencephalogram. Since brain activity at specific frequencies could be altered by applied EMFs, the results suggest that it may be possible to use EMFs to determine whether particular intrinsic frequencies subserve specific physiological or behavioral responses.”

In 1992, a study in the journal Acupuncture and Electro-Therapeutics Research published a study regarding the bio-magnetic field strength from the hands of Qi-gong practitioners. The results were as follows: “Only 3 subjects of them exhibited strong bio-magnetic field of 2 to 4 mGauss in frequency range of 4 to 10 Hz. This magnetic field strength was greater than that of normal human bio-magnetism by 1,000 times at least.”

If external electromagnetic frequencies can clearly affect brain function, and meditative practitioners of various spiritual practices can alter their own DC flow in their brain and

subsequently their hands/body, is it that far-fetched that a person can have a “DMT/spiritual” experience from the guru’s hands?

Maybe… maybe not.

In 1991, the American Journal of Chinese Medicine published a study citing the biochemical functions of cells being influenced by the “energy” emitted from a “Qi-gong” master. When crudely analyzing the cascade of changes that occur in the body during states that appear to correlate with endogenous DMT production, it becomes less and less far-fetched that a vast array of cellular changes would take place based on fluctuations in electrical signaling and very basic Epigenetic principles.

If we are to believe that the brain is the master control center of the body it shouldn’t be all that surprising that a distinct shift in DC direction in the brain would allow for significant abilities and/or experiences that differ when DC direction is flowing in the opposite manner.

This would be considered rather inescapable logic… yet the complexity of all the details can clearly be labeled as infinite.

IX. Wild Theories Part 2

Theories, theories, and more theories…

Maybe life within itself is just a “theory”.

Nevertheless, let us continue our theoretical journey of connecting dots and attempting to explain some of the strange occurrences surrounding DMT & Gamma waves.

6. Neurons in the brain and specific correlates throughout the body?
In 2005, the journal Nature published a study in which it was observed that a single neuron in the brain correlated to the recognition of a specific person/face. It is most famously known as the “Halle Berry Cell” which supports the theory of the “Grandmother Cell” (a hypothetical neuron that represents a complex but specific concept or object). Here is an excerpt from the write-up:

“Various pictures of Jennifer Aniston elicited a response in a single neuron inside the medial temporal lobe of another patient. Interestingly, images of her with her former husband Brad Pitt did not sway this cell, the authors of the paper report. Their findings appear this week in the journal Nature.”

“Quian Quiroga also found that a lone neuron in one subject responded selectively to various pictures of the actress Halle Berry - as well as drawings of her and her name written down. Other cells were found to respond to images of characters in The Simpsons or members of The Beatles.”

While the concept of the “grandmother cell” has yet to be universally accepted, it fails to dissuade us from postulating about the possibilities. If a single neuron is observed as being dedicated to one specific “thought” as the 2005 experiment implied, how does this relate to the human body? Could it be that a single neuron in the brain could possibly also correlate with a specific point within the body? In 2010, the book “Micropsychology” was released and authored by physics professor at Howard University, Dr. Yehuda Salu. Here is an excerpt from this book:

“The electric state of the neuron can be measured by an electrode (thin needle) inserted into it or positioned next to it. It is possible to detect when a neuron is collecting electricity and when it fires. By inserting electrodes into neurons at various brain regions and stimulating various body parts, correlations were found between firing neurons at various brain regions and those body parts. The entire surface of the body was divided

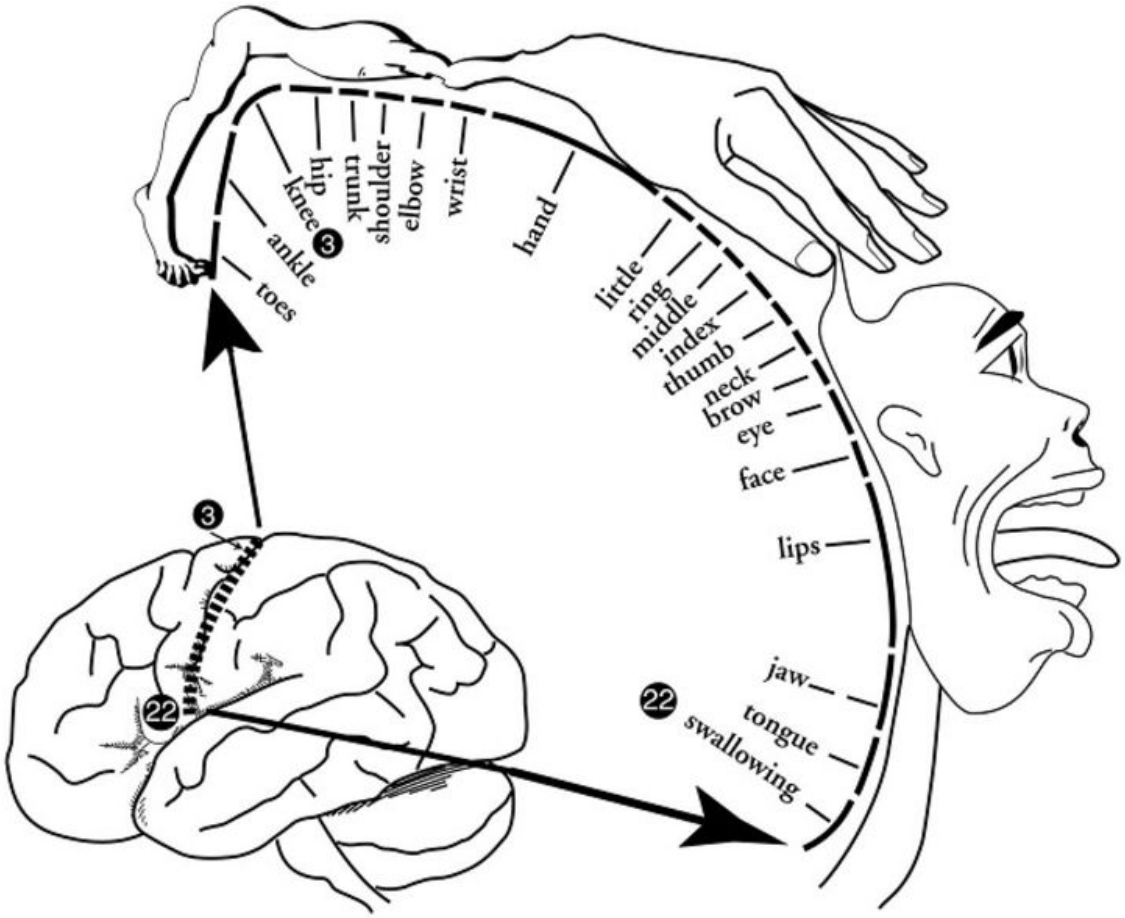
into small segments - pixels - and neurons that fire in response to specific pixels were identified and mapped. Each such neuron is said to represent its body pixel. Those neurons are organized in a brain area called the sensory part of the sensorimotor cortex."

"In humans, a certain part of the lower temporal lobe of the brain has also been implicated in facial recognition. Lesions to this region impair one's ability to recognize even familiar faces. Correlations have been found between the firing of certain neurons and activation of muscle units. Those neurons represent the activity of those muscle units."

Q4LT would make an inquiry to Dr. Salu regarding this passage and the experiments that correlated. He would reply, "Experiments of this kind were done around the beginning of the 20th century. Their result are summarized in what is now known as the homunculus. You can read about it in many biology texts. One of the researchers that did interesting experiments on patients that were undergoing brain surgery was Wilder Penfield. A similar approach is being used in studying vision. This is only the "tip of the iceberg"."

While the complexity of the brain/body relationship is undeniably intricate from multiple systemic perspectives, it appears rather intriguing that specific neurons within the brain can possibly be manipulated to directly affect specific points within the body. If we are to believe the general consensus that the brain is the "master control system" of the body, it would seem important to study the mechanisms in which desired changes can take place and possibly lead to reliable, systematic replication.

(The Homunculus, based on Penfield's classic diagram)



In [2005, a study from MIT was published in the Public Library of Science] outlining the observation of neuron growth in adult humans. This was previously thought impossible but it's been clear over the past decade that [neuroplastic changes] can take place within the adult human brain. Here is an [excerpt from Science Daily] regarding the study:

While scientists have focused mostly on trying to regenerate the long axons damaged in spinal cord injuries, the new finding suggests targeting a different part of the cell: the dendrite. A dendrite, from the Greek word for tree, is a branched projection of a nerve cell that conducts electrical stimulation to the cell body.

"We do see relatively large-scale growth" in the dendrites, Nedivi said. "Maybe we would get some level of improvement (in spinal cord patients) by embracing dendritic growth." The growth is affected by use, meaning the more the neurons are used, the more likely they are to grow, she said.

In 2014, the journal Science published a study outlining the effects of sleep on dendritic growth in mice. Here are the results of the study:

"We report in mouse motor cortex that sleep after motor learning promotes the formation of postsynaptic dendritic spines on a subset of branches of individual layer V pyramidal neurons. New spines are formed on different sets of dendritic branches in response to different learning tasks and are protected from being eliminated when multiple tasks are learned. Neurons activated during learning of a motor task are reactivated during subsequent non-rapid eye movement sleep, and disrupting this neuronal reactivation prevents branch-specific spine formation. These findings indicate that sleep has a key role in promoting learning-dependent synapse formation and maintenance on selected dendritic branches, which contribute to memory storage."

This is rather intriguing as we've previously outlined the DC shift that takes place in the brain during sleep that appears to simultaneously correlate with DMT synthesis & Gamma Wave formation. The neuronal dendritic branch growth of learned tasks during the mice sleep study seemingly provides support for the potentiality for targeted, real-time dendritic growth and neural connections taking place during the altered states of hypnosis/hypnagogia and meditation. This finding also appears to correlate with the 2015 study published in the journal Neuroimage which observes a measurably bigger brain in the morning following sleep.

As discussed in the earlier chapters, Gamma waves have been distinctly correlated with "new, neural networks forming". If we are to believe that a specific neuron correlates with a specific image/concept and a different neuron correlates with a specific "body pixel", could it be that the connection of these two neurons via induced Gamma waves can lead to the "supernormal" results outlined in the series?

An intriguing model/theory was proposed at the INCF Congress of Neuroinformatics in 2011. The proposal provides an additional angle to "chew on" especially as it pertains to the mechanisms driving neuron growth and potential connections:

"Our newfangled work in energetics based simulations established a robust link between the spike-activity characteristics of a single neuron to the intra-cellular energetics parameters leading to fine changes in the dynamics of mitochondria being reflected in the concomitant voltage-spike response (Venkateswaran et. al. 2010). The ensuing phase of the model integrates the anatomical aspects powered by neurogenesis and intra-cellular dynamics of the neuron by linking it through the ***physiological activity of voltage-gated ion channels.****"*

This model appears to propose that there is a distinct correlation between neuron growth/development and electrical activity regulated by voltage-gated ion channels. Based on the information we presented in Part 1 of this "Wild Theories" series, it'd appear relevant in regards to DMT's inhibition of voltage-gated sodium ion channels & the unique electrical activity associated with Gamma waves.

In 2015, a study was published in the journal Science that outlined the fact that a single neuron in the brain may carry over 1,000 genetic mutations. Here is an excerpt from ScienceDaily regarding the finding:
A single neuron in a normal adult brain likely has more than a thousand genetic mutations that are not present in the cells that surround it, according to new research from Howard Hughes Medical Institute (HHMI) scientists. The majority of these mutations appear to arise while genes are in active use, after brain development is complete.

"We found that the genes that the brain uses most of all are the genes that are most fragile and most likely to be mutated," says Christopher Walsh, an HHMI investigator at Boston Children's Hospital who led the research. What they found was that every neuron's genome was unique. Each had more than 1,000 point mutations (mutations that alter a single letter of the genetic code), and only a few mutations appeared in more than one cell. What's more, the nature of the variation was not quite what the scientists had expected.

"We expected these mutations to look like cancer mutations," Walsh says, explaining that cancer mutations tend to arise when DNA is imperfectly copied in preparation for cell division, "but in fact they have a unique signature all their own. The mutations that occur in the brain mostly seem to occur when the cells are expressing their genes."

"We knew that cells that shared a certain mutation were related, so we could look at how different cells in the adult were related to each other during development," explains Mollie Woodworth, a postdoctoral researcher in Walsh's lab. Their mapping revealed that closely relatedly cells could wind up quite distant from one another in the adult brain. A single patch of brain tissue might contain cells from five different lineages that diverged before the developing brain had even separated from other tissues in the fetus. "We could identify mutations that happened really early, before the brain existed, and we found that cells that had those mutations were nestled next to cells that had totally different mutations," Woodworth says. ***In fact, the scientists found, a particular***

neuron might be more closely related to a cell in the heart than to a neighboring neuron.

When factoring in all the studies and theoretical models, the potentials are intriguing…

7. Mechanics of "Miraculous Spontaneous Healing"
It'd seem rather silly for any person with a very basic level of rational, scientific thought process to discount the fact that spontaneous healing of disease has reportedly taken place both in modern times and historically across the entire globe. To a lesser extent, the concept known as the "placebo effect" could be considered to be a milder version of this dramatic phenomenon.

Earlier this year (2016), the Journal of Physiology published a study that outlined the bioelectric mechanism of a genetic disorder that causes facial abnormalities. Here are some excerpts from the write-up of the study at Tufts University:
"Dany Spencer Adams, a research associate professor in the Department of Biology in the School of Arts and Sciences, and colleagues at Tufts, MIT and RMIT University in Australia used an embryonic frog model to demonstrate for the first time that ***faulty bioelectric signaling is responsible*** *for the craniofacial defects associated with the genetic disorder Andersen-Tawil Syndrome (ATS)."*

"The work bolsters earlier findings by Tufts researchers that bioelectric signaling in many cell types, not only nerves, plays a major role in how cells create and repair complex anatomical structures, says Michael Levin, A92, director of the Tufts Center for Regenerative and Developmental Biology and a co-author of the study. With that knowledge, he says, it may be possible to alter bioelectrical signaling to correct the effects of genetic mutations or other developmental defects. "That's the big picture here," says Levin, who is also the Vannevar Bush Professor in the Department of Biology.

Bioelectricity is also implicated in the development of cancer, says Adams. ***Cancer cells are too positively charged, compared with healthy cells,*** *and some research has shown that restoring malignant cells' voltage through ion channel regulation tends to return them to a normal, non-malignant state, she says.*

The Adams and Levin labs are two of just a handful in the world studying bioelectricity in cells outside the nervous system. In earlier research, the two teams demonstrated that bioelectric signaling is involved in regulating gene expression and anatomical structure

in a range of organs by dictating the fate of cells and tissues during development, regeneration and cancer suppression.

If cancer is considered to originate from the mutation of one's own DNA that is correlated with abnormal electrical cellular signaling (chronic stress) potentially originating in the brain, it'd seem pertinent to think of the possibilities of "positive" mutation as it pertains to neural correlates extending their signals to specific areas of the body based on stimulation of the neuron/neural correlates. Based on the 2015 study stating that the "genes that are used the most are the most likely to be mutated", we can theoretically postulate that increasing one's DMT levels while holding a specific intent (& simultaneously generating a Gamma Wave spike) could possibly alter a person's neuronal genetic mutations while subsequently forming new pathways/networks based on intent (thought/visualization). This would theoretically then lead to the proper electrical signaling that would reverse the abnormal electrical charge of cancer cells leading to a spontaneous "miraculous" remission. This doesn't even begin to touch upon the cascade of anti-cancer compounds such as melatonin, glutathione, pinoline, and superoxide dismutase that appear to surge during the mechanics for DMT production.

Like we touched upon in Part 1 of "Wild Theories", the compounds that we feel are most closely coupled with the "electrical" body would likely be sodium and chloride (salt). It'd seem logical that a fluctuation in these ions from an intracellular/extracellular level would manifest themselves as it pertains to differentiation between diseased cells and healthy cells. As mentioned above by Dr. Adams, cancer cells are more positively charged (less negative ions) than regular cells. This concept was clearly showcased in a 1980 study published in the journal Cancer Research. A more positive charge in cancer cells would also be associated with an excess of sodium ions which was showcased in a separate 1980 study published in Cancer Research.

From an extremely crude observation, it'd appear that possibly inducing an influx of negative ions into the cancer cell would subsequently "fix" the situation.

In 2014, a study was published in the journal Nature Chemistry regarding a synthetic ion transporter that caused apoptosis (death) of cancer cells via an influx of chloride and sodium ions into the cells. The study would take place at the University of Southampton. Here is an excerpt of a write-up of the study from the University website:
Researchers from the University of Southampton are part of an international team that has helped to create a molecule that can cause cancer cells to self-destruct by carrying sodium and chloride ions into the cells. Study co-author Professor Philip Gale, of the University of Southampton, says: "This work shows how chloride transporters can work

with sodium channels in cell membranes to cause an influx of salt into a cell. We found we can trigger cell death with salt."

Cells in the human body work hard to maintain a stable concentration of ions inside their cell membranes. Disruption of this delicate balance can trigger cells to go through apoptosis, known as programmed cell death, a mechanism the body uses to rid itself of damaged or dangerous cells.

One way of destroying cancer cells is to trigger this self-destruct sequence by changing the ion balance in cells. Unfortunately, when a cell becomes cancerous, it changes the way it transports ions across its cell membrane in a way that blocks apoptosis.

One of the key findings was that the cancer cell's ion concentrations changed before apoptosis was triggered, rather than as a side effect of the cell's death. "We have thus closed the loop and shown that this mechanism of chloride influx into the cell by a synthetic transporter does indeed trigger apoptosis," said Professor Sessler. "This is exciting because it points the way towards a new approach to anticancer drug development."

Perhaps this is partially an aspect of the inherent, innate mechanism of the body to induce spontaneous "miraculous" healing? The brain would undergo a DC shift coupled/signified by DMT release which subsequently reverses impaired signaling which would then send the proper electrical signaling to the cancerous tumor/cells to uptake the correct balance of ions to reverse it's malfunctioning?

A 2014 paper in the journal Frontiers in Oncology discusses numerous compounds that lead to the depolarization of cancer cells leading to their death. Here is an excerpt from the abstract:
Apoptosis is characterized by cell shrinkage caused by disruption of the maintenance of the normal physiological concentrations of K+ and Na+ and intracellular ion homeostasis. The disrupted ion homeostasis leads to depolarization and apoptosis. Recent evidence suggests that depolarization is an early and prerequisite event during TRAIL-induced apoptosis. Moreover, diverse natural products and synthetic chemicals capable of ***depolarizing the cell membrane exhibit tumor-selective killing*** *and TRAIL-sensitizing effects.*

Yes, yes… we've been digressing from the original topic but the importance of postulating about these mechanisms of strange occurrences during hypnosis (growing taller, hair growth, enhanced physical parts) seem eerily similar to those of the

“miraculous”. It’d seem that in 2016 it would make little sense to simply throw one’s hands up and either deny these transpirations or attribute them to unexplainable “supernatural” forces. That isn’t to say that the “supernatural” doesn’t exist… we’re merely stating that if we put enough data on the table from multiple perspectives, it wouldn’t be completely outlandish to explain these observations from a basic, biological perspective.

8. Edgar Cayce “The Sleeping Prophet”

As we stated in part 4 of our DMT/Gamma Waves series, hypnagogic techniques were apparently utilized by some of the greatest minds of modern times. Thomas Edison, Nikola Tesla, and Isaac Newton were a few proponents of this EEG alteration method as a way to gain deeper insights and solutions into their work.

In 1877, a man named Edgar Cayce was born. While I won’t go into the details of his life, he eventually became known as “The Sleeping Prophet”. The reason for this is because he developed the ability to put himself in a “sleeping” trance (a form of self-hypnosis/hypnagogia) in which he would be asked questions and answer them in a manner he was incapable of during his conscious waking state. Throughout his lifetime, Cayce would give a total of 14,306 transcribed readings with many of them dedicated to diagnosing illnesses.

Based on the information available, it seems as though Cayce was able to easily and consistently maintain a deep level of hypnagogia for extended periods of time. Being that he could not remember any of what he said during his trance sessions, it would appear that he could be categorized as a somnambulist.

While there are many skeptics of Cayce and his reported abilities to reach extremely detailed conclusions and resolutions for sick people, these abilities do not seem overly outlandish when considering the entire body of information presented in our 6 part series. Since Cayce was able to maintain his trance for prolonged periods of time it wouldn’t be surprising if he was generating Theta/Gamma waves constantly while simultaneously synthesizing DMT. There are rumors that much like Einstein, Cayce possessed a larger than average Corpus Callosum but we’ve been unable to verify this rumor.

Here is an interesting excerpt from the book “Edgar Cayce, The American Prophet” - Sydney, Kirkpatrick, pages 123-124:

“By this point in Edgar Cayce’s career, reports of his amazing talents had begun to cross state borders. This was mostly the result of the work of Blackburn’s committee, but also of efforts made by a new friend and admirer- Professor Joe Dickey, who was soon to become the president of Bowling Green Business University. Like Blackburn, Dickey witnessed and conducted numerous trance readings between the years 1905 and 1907, and along with other Cayce supporters, sent a veritable deluge of letters to important people asking that they witness for themselves the Cayce phenomenon.

Among the people that Edgar Cayce saw during this time were the inventors Thomas Edison and Nikola Tesla, who had been invited to Bowling Green Business School by Dickey as part of a university lecture series on modern scientific discoveries. Unfortunately, little is known about these meetings. No documentary evidence exists in the Edison or Tesla archives, and Cayce’s date book and other records pertaining to the meetings were later destroyed in two separate fires at Cayce’s Bowling Green photography studios. Additional correspondence known to have existed between Cayce, Edison, and Tesla was also later destroyed by a well-meaning but short-sighted volunteer at the Edgar Cayce archive in Virginia Beach.

However, while no diary or first-person correspondence now exists to describe the meetings, the original letters from Edison and Tesla would be reviewed by Cayce’s longtime secretary, Gladys Davis, as well as Roswell Field, a Chicago reporter who sought biographical information about Cayce for a Hearst newspaper story in 1911. This evidence, along with the text of a recently unearthed speech Cayce delivered in Washington, D.C., and a brief passage in one of Cayce’s memoirs, provides tantalizing clues as to what may have transpired.

The topic of interest to Edison–like Tesla– was the possible connections between electricity and psychic phenomena. Tesla’s interest in the subject was legendary, for he himself claimed to have received inspiration from his “higher self”, not unlike that received by Edgar Cayce. Through dreams and visions, Tesla received mental pictures of blueprints and other technical data, which included innovations he made on high-frequency electrical transmission and wireless communications. He viewed his role as an inventor as merely tapping into his own imagination and turning what he saw in visions into a physical reality. Tesla’s one-time partner, Edison, did not ascribe his inventions to any such help from “above”. And yet, the fact that Edison developed a keen interest in psychic

phenomena and electricity is also well documented, as were his comments to associates concerning his intent to build a device to measure the electrical vibrations emanating from people engaged in psychic activity. Edison's interest in building such a device may well have been the result of his meeting with Cayce.“

While it appears that there might not be any official documentation in terms of Edison's or Tesla's interactions with Cayce, it doesn't seem unfathomable for them to be interested in a person who could easily prolong a brain wave pattern that they found difficult to sustain.

There's a reason we titled this series "Wild Theories. Much of these details will never be proven in this lifetime based on the invasive nature of doing so. However, it doesn't mean that the end result cannot be replicated and showcased on a consistent basis. Until we're able to explain all the cute, intricate, super nerdy details… "miracles" will stay “miracles”.

PS. This year, Tufts University presented an extremely interesting study/finding published on their website. It outlines the fact that bioelectrical signaling imprints were observed *prior* to the formation of a physical structure. I do believe this was observed and documented by Dr. Robert O. Becker in his book “The Body Electric”.**“The Tufts biologists found that, before the face of a tadpole develops, bioelectrical signals (ion flux) cause groups of cells to form patterns marked by different membrane voltage and pH levels. When stained with a reporter dye, hyperpolarized (negatively charged) areas shine brightly, while other areas appear darker, creating an "electric face.”**

X. Wild Theories Part 3

So far in this "Wild Theories" series, we've covered about 8 points that we believe might be pertinent to discuss as it pertains to DMT & Gamma Wave formation. In Part 1, we looked at the perceived "subconscious to superconscious" coupling of slow and fast waves, the electrical current direction of the brain affecting the body, the apparent coherence of brain hemispheres & it's implications, and how much of this ties into the "mystical" healing properties of reported spiritual "gurus". In Part 2 we speculated regarding precise neural correlates within the body, the proposed engineering of "spontaneous, miraculous" healing, and even touched upon the man known as "The Sleeping Prophet" Edgar Cayce.

Now it's time to get a little *more* wild…

9. Sprouting Buds
This is likely the strangest theory in this series as there will be no direct scientific studies to support any of it. Nevertheless… let us proceed forward.

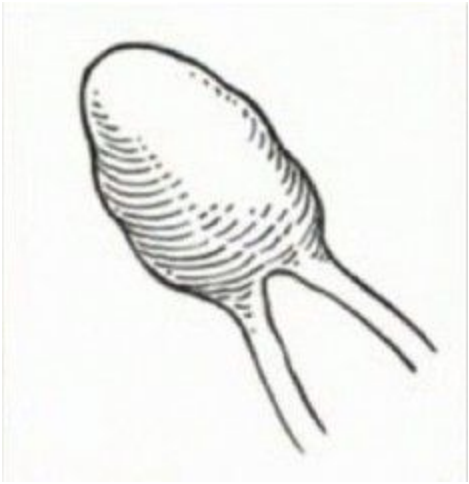
In virtually every plant or tree I've ever come across, there is this thing called a "bud". It's officially classified as "an undeveloped or embryonic shoot that normally occurs in the axil of a leaf or at the tip of a stem". It would appear that the natural progression of a bud is to eventually sprout which leads to even further expansion of the plant via the formation of a flower, fruit, and/or seed(s).

What does this have to do with DMT & Gamma Waves?

Much discussion and speculation regarding the Pineal Gland has been circulated regarding endogenous DMT production. It wasn't until a 2013 study published in the journal Biomedical Chromatography that it was officially observed that DMT and its enzymatic precursors were found in the pineal gland of live rats. In 2015, Q4LT would interview veteran DMT researcher Dr. Steven Barker regarding this finding and its implications.

It's more commonly known that the pineal gland secretes Melatonin. This hormone has largely been attributed to regulating circadian rhythms (although Melatonin appears to have a much more extensive function than merely influencing one's sleep cycle). A 2001 study published in the journal Endocrinology observed that Melatonin enters the cerebrospinal fluid (CSF) via the Pineal Gland.

(Pineal Gland name derived from resemblance to a Pine Cone)



While plants across the world have evolved mechanisms to “sprout” their buds… what does this have to do with humans?

I recall watching a documentary a few years ago that showcased a man in Indonesia who had developed a skin condition so severe that he became known as the “tree man”. In “modern” medical terms this skin condition is labeled “Epidermodysplasia Verruciformis” or “ "Lewandowsky-Lutz Dysplasia”. It is considered to be a rare autosomal recessive genetic hereditary disorder associated with abnormal susceptibility to the human papillomaviruses (HPVs) of the skin. Unfortunately the man who developed this condition, Dede Koswara, would pass away from complications related to this condition in 2015. While “modern” medical terms labeled his disease as a *severe* skin condition, it would appear that there is something a little more profound taking place when looking at the images and video of Mr. Koswara.

(I do find it rather amusing that we can label a disease while having absolutely no proper way to address it.)

The reason for bringing this case up is due to the possibility of humans possibly containing recessive genetic components linked to the plant genome. As ridiculous as this might sound, according to a 2010 discussion hosted by the National Human Genome Research Institute, a genetic counseling specialist stated “The truth of the matter is that the basic structure of DNA (ie, double helix) is shared among all living organisms. The code or sequence of DNA (instructions for our cells) is different. Even so, our DNA is likely more similar to plants than different. For example, **we share approximately 60% of our DNA with a banana plant.**”

In 2015, a study at the University of Cambridge showcased the observation of "horizontal gene transfer" which is the transfer of genes between organisms living in the same environment. Here is an excerpt from the study:
Horizontal gene transfer is also thought to play an important role in the evolution of some animals, including nematode worms, which have acquired genes from microorganisms and plants, and some beetles that gained bacterial genes to produce enzymes for digesting coffee berries. However, the idea that horizontal gene transfer occurs in more complex animals, such as humans has been widely debated and contested."

Lead author Alastair Crisp from the Department of Chemical Engineering and Biotechnology at the University of Cambridge said: "This is the first study to show how widely horizontal gene transfer occurs in animals, including humans, giving rise to tens or hundreds of active 'foreign' genes. Surprisingly, far from being a rare occurrence, it appears that this has contributed to the evolution of many, perhaps all, animals and that the process is ongoing. We may need to re-evaluate how we think about evolution."

In humans, they confirmed 17 previously-reported genes acquired from horizontal gene transfer, and identified 128 additional foreign genes in the human genome that have not previously been reported. A number of genes, including the ABO gene, which determines an individual's blood group, were also confirmed as having been acquired by vertebrates through horizontal gene transfer. The majority of the genes were related to enzymes involved in metabolism.

Back to the pineal gland sprouting…

I find it interesting that while there seems to be significant genetic overlap among mammalian and plant species, there might be the outside chance that some anatomical similarities might exist as well. The fact that humans share 60% of their DNA with a banana plant would make this theory a bit *less* preposterous than one might initially think. While it's hard to imagine the pineal gland opening up and creating tree-like branches within a person's brain, it might not seem overly ridiculous when considering the manner in which neurons and dendritic branches develop and expand according to electrical amplification (EEG state) within the brain. Interestingly enough… the pineal gland bears some slight resemblance to a plant-like buds sitting atop the spinal column (the plant counterpart being the stem of a plant). While it'd be extremely difficult to verify pineal gland structural changes during activities such as sleep, hypnosis, & meditation (due to the physically invasive nature of doing so), we can make certain semi-educated, yet wild postulations as to what might be transpiring.

Somehow I believe it's interesting and possibly pertinent to note the hygromorphic (objects that change shape based on moisture) properties of a pine cone. For those of you that have never observed this before… a pine cone that has fallen from a tree begins to open as moisture dissipates from it. If the pine cone is exposed to water or even elevated humidity, it begins to close.

In 2010, the journal Cerebrospinal Fluid Research published a paper titled "Cerebrospinal fluid sodium rhythms". Here is a pertinent excerpt from the paper in regards to fluctuating sodium levels as it pertains to sleep:
"Sodium chronobiology has been studied in blood and urine from young, healthy volunteers and was shown to decrease from midnight to early morning [20-22]. Elderly healthy volunteers also had a similar circadian rhythm for blood sodium, though the amplitude of change was reduced compared to younger persons [23]. More frequent sampling in rats demonstrated increasing blood plasma sodium during sleep, with a decrease prior to waking [24]. These results suggest that brain/CSF sodium rhythms are differentially regulated from the systemic circulation.

This series of studies possibly correlate to the "sprouting bud" theory based on the general concept of water/moisture following salt. If sodium fluctuations occur regularly during sleep, and sleep is associated with melatonin release (and likely DMT), it'd appear semi-logical to assume that there is the potentiality for fluid to be dispersed from the pineal gland which causes a hygromorphic reaction much like the pine cone. In Part 1 of "Wild Theories" we cited the 2009 study in the journal Science that showcased DMT's role in inhibiting voltage-gated sodium ion (Na+) channels. Perhaps DMT release (pineal gland "sprouting") correlates with greater sodium levels in the brain… something akin to "brain pollen"?

Just some fruit for thought…

10. Twig or a Tree… The Dopamine Feedback Loop
Continuing the discussion of "tree-like" features that might correlate with brain activity and feedback loops…

In the brain, dopamine functions as a neurotransmitter—a chemical released by neurons to send signals to other nerve cells. The brain includes several distinct dopamine pathways, one of which plays a major role in reward-motivated behavior. Most types of reward increase the level of dopamine in the brain, and most addictive drugs increase dopamine neuronal activity.

The mesolimbic pathway (known as the “reward pathway”), is a neural pathway in the brain that transmits dopamine from one region of the brain to another. It is the most significant neural pathway in the brain in which changes occur in all known forms of addiction.

Addiction would seem to develop at many levels.

While we largely attribute the concept of addiction to drug usage (both legal and illegal), it would appear that the mechanisms for addiction can branch out far past externally ingested substances. If we are to comprehend the mechanisms in which dopamine surges occur within the brain in conjunction with how neural pathways develop, we might have a better comprehension as to why meditation, hypnosis, DMT/Ayahuasca, and restful sleep are so effective to combat addictive and/or depressive behavior (both seem to go hand in hand).

In 2014, the journal Dialogues in Clinical Neuroscience published a paper outlining the pathophysiology for depression. The paper proposed the following: “Stress and depression are associated with neuronal atrophy, characterized by loss of synaptic connections in key cortical and limbic brain regions implicated in depression.”

Neuronal atrophy would correlate with a weakened structure of neural pathways developed throughout the brain. If the neural structures and connections developed throughout the brain are lessened, the level of dopamine released would also appear to be suppressed. However, if there is a particular neural pathway that is more developed than the rest, it would make logical sense that a person would consistently tap into that specific pathway in order to maximize their suppressed dopamine surges. This would then lead to what is perceived as “addictive” behavior.

In our earlier chapters, we outlined the fact that “Aha!” moments correlated with new neuronal connections being made in accordance with the 40 Hz (Gamma) range of brain activity. In general, one would attribute these moments or frequency with problem solving and creativity.

Perhaps instead of focusing on the “negative” addictive or depressive behavior, it’s important to note the amount of activities correlated with problem solving or creativity in a person’s life. It has been observed that as education and occupation becomes more and more specialized, the ability to expand one’s creativity or problem solving capabilities would appear to become narrower. In essence, the predominant time frame a person spends in their waking state tends to become utilized in a narrower neural

pathway as time progresses. It should then fail to surprise anyone as to the reason for depression and/or workaholic/addictive behavior due to the inability to expand neural connections outside of the specialized field.

It is also my personal opinion that this is the type of physiology and behavioral feedback loop that leads our society to focus on the intricate detailed mechanisms of something without necessarily tying the details into the whole. While we continue to dive into our specialized fields and attempt to expand these relatively constricted neural pathways branch by branch, we become less cognizant of how our findings tie into the bigger picture due to an imbalanced development of that neural network. This is the type of thinking that might lead to the following imbalanced transpirations that seem rather obviously silly and unintelligent:

Embracing war for an end result of peace
The development of artificial fertilization methods and excessive pesticide usage for crops while negating the fact that optimally mineral balanced soil negates the need for such tactics
The development of drugs that address disease via genetic pathway signaling while failing to focus on upstream immune system enhancing protocols and Epigenetic factors
The financial imbalance found throughout the world
The grotesque amount of artificial components found in processed foods in order to extend the shelf life and increase manufacturing efficiency
The incessant usage of electronic devices to the detriment of one's social life and health
The ability to label thousands of diseases without providing effective, harmless treatments to address them

The list could literally go on and on.

I believe that it is not necessarily that people are inherently evil or stupid per say but that their neural pathways have become so specialized and specific that they are literally physically incapable of tapping into a thought that has no developed connection with their established pathway. If the specific pathway has developed on pure technicalities and details with no tie-in to outside qualities such as empathy or sympathy, it would make logical sense why a person's decisions could seem so "heartless". The person's brain would literally be disconnected from any emotional judgement outside of the technicalities. There would be no additional dopamine surge from attempting to make that connection… in fact it might physically *distress* a person to

even attempt to make that connection. The only thing that would create increased dopamine surges and pleasure in the person's brain would be to delve further and further into the established pathway until they end up with a grotesque abomination like… a Hungry Man's "meal", or… 0.1% of the population hoarding the world's wealth while billions of people live in horrific conditions.

While we carry a belief that as modernized societies, we have utilized scientific methodology to increase efficiency on all fronts based on systematic progression of past ideas, it might behoove us to take a small step back and attempt to tie-in how our specific fields or duties affect the whole.

I'm digressing but at the same time… maybe not so much.

I do believe we are living in a deeply DMT deficient society based on eating too much, breathing too shallow, thinking too small, and stressing too much.

If all or even some of what has been stated is potentially true, it would also make logical sense as to why Ayahuasca/DMT and activities that stimulate endogenous DMT synthesis which lead to greater neural connections synergistically linked with Gamma Waves would alleviate addiction/depression rather quickly. A person's ability to induce dopamine surges would appear to be magnified during and following these activities.

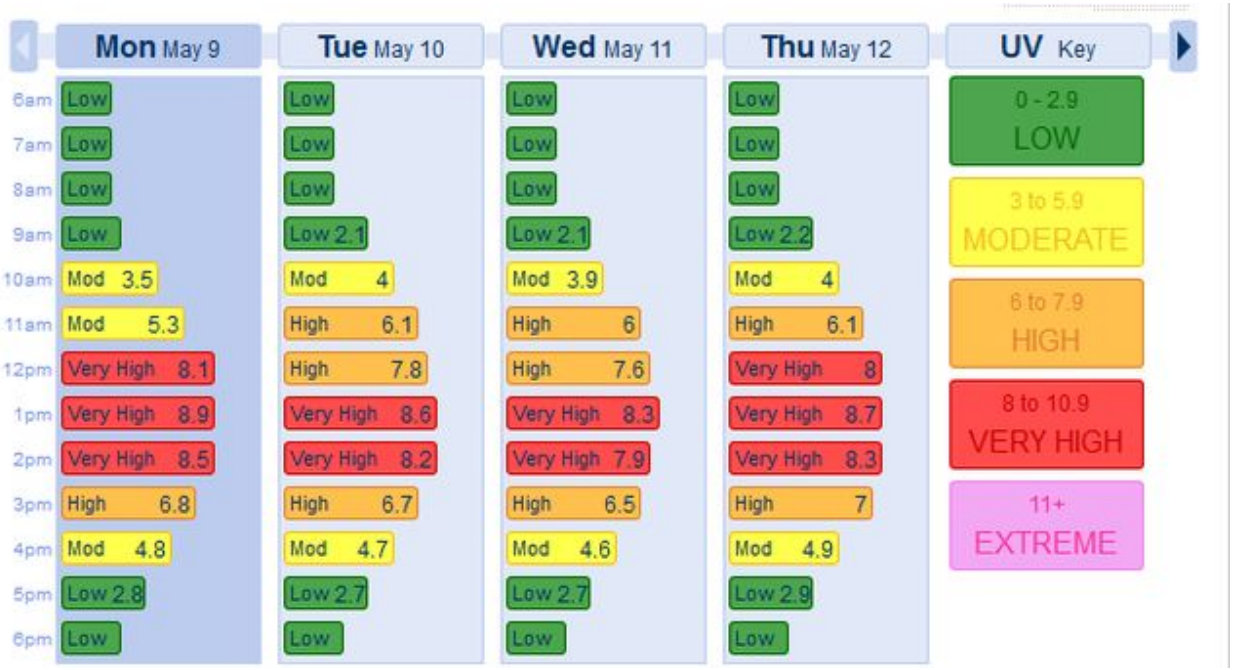
Anecdotal reports following Ayahuasca/DMT administration seem to follow similar trends in the sense that many people have reported feeling much more "connected" to others. In some cases, people have reported complete changes in demeanor, habits, and routines following their experiences. Perhaps this has to do with realized physical changes in the brain and new connections forming. Some of these aspects are touched upon in a recent 2016 article in the journal Frontiers in Pharmacology.

In Chapter 6, we cited the study from Dr. Juan Acosta-Urquidi in regards to the massive changes in brain coherence from baseline to DMT administration. In Part 2 we outlined the huge Gamma wave spikes during meditation from the "Happiest Man in the World" Matthie Richard as well as the effects of meditation on Corpus Callosum development.

Perhaps that is the key to being able to easily induce vast amounts of "feel good" dopamine surges within the brain. Maybe instead of a tiny twig-like neural structure within the brain in which a person incessantly attempts to build upon for pleasure, the person with a robust tree-like structure with vast neural connections only needs to still the mind and engage in a few deep breaths to produce huge dopamine "hits".

11. Sun-Gazing

This is considered to be an ancient practice in which a person looks directly at the sun during sunrise or sunset. While this might sound quite strange, interestingly enough during these moments the UV ray index for the sun is extremely low and even zero in certain areas. In essence, the damaging effects from the sun is essentially negated during these moments. While the physiological effects of “Sun Gazing” on the body have not been studied extensively by mainstream science, when comparing the human anatomical properties to that of a plant, it does seem rather intriguing.



The most famous proponent of “Sun Gazing” was a man known as Hira Ratan Manek (HRM). He has stated that the proper method to begin to adopt this practice is by gazing at the sun for only 10 seconds initially (precisely when the sun is setting). HRM then states that you can increase your time “Sun Gazing” by 10 seconds each day until you reach the maximum of of 44 minutes. In the past, HRM has claimed the ability to sustain himself with virtually a minuscule amount of food due to this practice.

Neurologist, George C. Brainard PhD from the Thomas Jefferson University and leading expert on neuroendocrine physiology reportedly observed Manek in 2002. Alongside Brainard was neuroscientist Andrew Newberg who is certified in internal and nuclear medicine. The biggest take away in the study from my perspective was the reported measurement of Manek’s Pineal Gland.

According to a study published in the "American Journal of Neuroradiology", the average pineal gland size amongst fully matured adults measures approximately 7.4mm in length and 6.9mm in width. According to the study conducted by Newberg and Brainard, Manek's pineal gland measured 11mm in length and 8mm in width.

Q4LT has attempted to contact both Dr. Brainard & Dr. Newberg to verify this claim of an enlarged pineal gland in HRM but has received no reply as of this moment. When contemplating the immense importance of melatonin levels in the body for virtually all organs and cells, the implications of this findings would appear to be tremendous. This doesn't even touch upon the aspects of DMT synthesis from a "super-sized" pineal gland. Much like the sun powers the buds on a plant to sprout… is it that far-fetched to believe that consistent, gentle sunlight could cause a similar sort of effect on the human "bud" known as the pineal gland?

One of the predominant effects of Sun Gazing reported by practitioners is a sense of euphoria when partaking in the practice. Perhaps this coincides with the low level DMT administration documented in Dr. Rick Strassman's trial?

(In a YouTube video named "Sungazing Documentary", Dr. Fred Travis, the Director of the Center for Brain, Consciousness, and Cognition at Maharishi University of Management would perform an EEG analysis of the film producer while Sun Gazing. He compared the brain activity of the subject looking at a tree vs. looking at the sun. The results showcased greater brain coherence when Sun Gazing as well as significantly higher Gamma activity. This footage can be seen here.)

(It's mildly interesting that the structures of Hemoglobin and Chlorophyll are rather similar. The fact that acidic conditions cause the release of magnesium from Chlorophyll (leading to the formation of Pheophytin) as well as the release of iron from Hemoglobin makes one wonder… what happens when the reverse environment (alkalinity) is induced?
Bilirubin (also known as Pheophytin) is considered to be the "yellow breakdown product of normal hemoglobin catabolism, caused by the body's clearance of aged red blood cells". In 2009 the Journal of American Chemical Society published the first ever finding of Bilirubin in a plant species. In 2014 in the Journal of Cell Science, researchers observed mammalian mitochondria capturing light and synthesizing ATP when mixed with the light-capturing metabolite of Chlorophyll. Perhaps there is more overlap amongst plant and

animal species than was first assumed? As crazy as it sounds… maybe someday scientists will find a human who produces Chlorophyll endogenously?)

Maybe the speculations and theories in this part of the “Wild Theories” were a bit much. Comparing the anatomical structures of a mammalian creature with that of a plant? Contemplation of addictive/depressive behavior with that of an underdeveloped, imbalanced tree formation?

Yes, I understand the quantum leaps were are taking in terms of theoretical postulations but what else are we supposed to do with that pine cone-like structure in the middle of our heads?

XI. Wild Theories Part 4

We've come to the "End of the Road" as they say.

This will be the final installment of "Wild Theories" as we wrap up the implausible methodology of thought we have presented to the public.

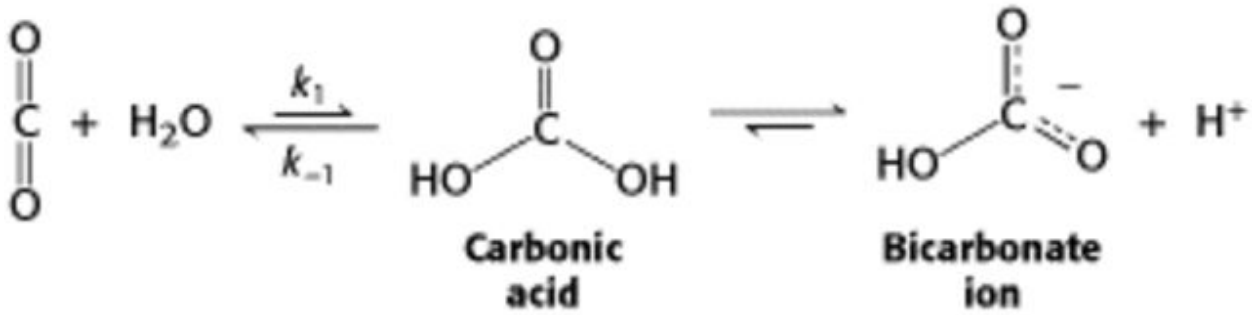
DMT is a conundrum within itself as being an endogenous hallucinogenic compound makes little logical sense. If we are to believe that evolution has provided the natural selection for the optimization of the multitude of species we know today, it is difficult to make the case that hallucinatory compounds assist in the proliferation and survival of a species. That is… unless DMT serves a greater innate purpose than providing "visions" for the hundreds of plants and dozens of animals it has been found to subside in. We must remain cognizant that there are levels to everything and DMT is no different. In Dr. Rick Strassman's book he meticulously provided some framework for this as he would administer 5 different doses (0.05mg/kg, 0.1, 0.2, 0.3, & 0.4) of DMT to his volunteers with vastly different experiential remarks in accordance with dose amount.

Gamma waves are intriguing to observe as they appear to correlate with a higher order of consciousness and neural pathway formation. It would seem pertinent to discuss the formation of these brain waves as it pertains to the optimization of a person's brain function as well as their overall health. There are hints that these brain waves correlate with a greater hemispheric coherence and brain connectivity which would logically lead us to postulate that greater abilities coincide with a more robust, symmetrical utilization of the brain versus the normal asymmetry. Maybe most importantly Gamma waves seem to arise during moments of apparent "supernormal" abilities. This is key as it allows the public to observe the innate potential behind this EEG state and hormonal release. Externalization is a must in order to be taken seriously by scientific circles.

Nevertheless… let us finish this series while continuing to ask what we believe are important questions as it pertains to both endogenous DMT synthesis and Gamma wave formation.

12. Chloride Shift & "Electrical Water"

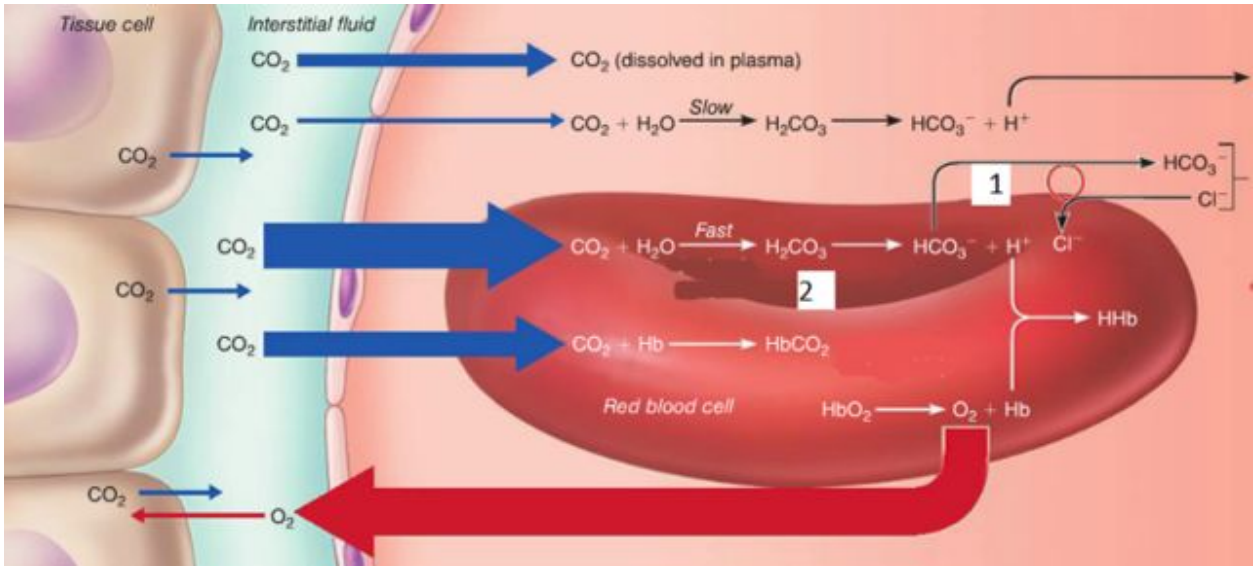
Carbon dioxide (CO_2) generated in tissues (from cell metabolism) passively diffuses into capillaries via the interstitial fluid. Once in the bloodstream, CO_2 then enters red blood cells and the enzyme carbonic anhydrase converts CO_2 and intracellular water (H_2O) to carbonic acid (H_2CO_3), which spontaneously splits into bicarbonate (HCO_3^-) and a hydrogen ion (H^+).



The Guyton and Hall Textbook of Medical Physiology states the following regarding Chloride Shift:

“Chloride shift (Hamburger phenomenon) - the HCO3- diffuses out of the Red Blood Cells (RBCs) into the plasma (blood), the inside of the cell becomes less negatively charged. Because the RBC membrane is relatively impermeable to cations, so in order to neutralize this effect, negatively charged chloride ions (Cl-) diffuse from the plasma (blood) into the RBCs to replace the HCO3-. The movement of chloride ions into the RBCs is called chloride shift. This process is mediated by Band 3, a major ion exchange membrane protein. The chloride shift occurs very rapidly and essentially completed in 1 second. As a result of chloride shift, the total number of ions inside the RBCs increase, so the osmotic pressure inside the RBCs becomes higher than that of the plasma (blood). This causes osmotic absorption of fluid into the RBCs.”

(Here is the visual description of the process:)



Based on analyzing the various endogenously induced altered states of consciousness that appear to relate to DMT synthesis, it seems that the levels of CO2 production have

been suppressed. Since we've already covered this extensively in past pieces there is little need to summarize this aspect.

The suppressed CO2 aspect appears to relate to "Chloride Shift" being that bicarbonate (HCO3-) formation is based upon CO2 production. If CO2 production falls, it would appear as though bicarbonate formation would also fall. If bicarbonate formation is suppressed, there would appear to be a measurable difference in Chloride levels based on the outlined mechanisms of Chloride Shift.

In the book "Clinical Methods: The History, Physical, and Laboratory Examinations", Chapter 197 discusses serum Chloride stating: "In addition, respiratory alkalosis, a condition seen in individuals with hyperventilation is associated with an elevated serum chloride concentration and a low bicarbonate concentration."

This observation was also reported in a 1997 study published in the American Journal of Physiology which cited the following results as it pertains to hyperventilation: "In ARALK (acute respiratory alkalosis) blood, pH increased to 7.6, and blood bicarbonate concentration ([HCO3-]) decreased from 29 to 22 mM."

What about the "Electrical Water" aspect?

In 2013, Dr. Gerald Pollack would release his ground-breaking book titled "The Fourth Phase of Water". In this book he documents his findings regarding the properties of Exclusion Zone (EZ) water in which the molecules organize themselves into H3O2 (water (H2O) + hydroxide (OH-)) rather than simply H2O. This is a more viscous type of water that carries a negative electrical charge that is found within cells.

Warning: Much of the following is based on pure wild, nonsensical speculation
Part of the mechanism utilized by the enzyme carbonic anhydrase to form hydrogen (H+) and bicarbonate (HCO3-) from CO2 & H2O, is the combining of a hydroxide (OH-) ion with CO2 to form bicarbonate (HCO3-). The question that presents itself is… what happens to the hydroxide (OH-) ion when no CO2 is present to bind to it? Does it happen to bind to the H2O in the cell increasing the amount of intracellular H3O2?

If intracellular H3O2 increases, does that lead to the diffusion of Chloride ions out of the RBCs and into the plasma which leads to the elevated Chloride levels showcased during respiratory alkalosis? It would seem that an overabundance of both H3O2 *and* Chloride ions within a RBC would cause an overly negative charge and a subsequent overflux of fluid absorption potentially leading to cell rupture. We assume that natural

mechanisms arise to alleviate imbalanced situations. A 1999 study in the Journal of Pineal Research might provide some answers as the results found that Melatonin protects RBCs from rupturing. Being that blood takes about one minute to circulate throughout the entire body it would appear that the cycling of the blood during sustained rhythmic breathing might provide the mechanics for H3O2 formation. The book titled "Fundamentals of Biochemistry: Life at the Molecular Level" states that 10% of the total blood CO2 is lost through the lungs in each circulatory cycle. The fact that Chloride shift is cited as increasing the osmotic pressure within RBCs and Dr. Pollack has cited pressure as a key component of H3O2 formation, this reinforces our speculation of sustained rhythmic breathing as leading to elevated EZ water within our cells.

(A 2012 article in the journal Blood Transfusion might add some insight to H3O2 formation based on the following: "Of particular promise are the alkaline, chloride-free, hypotonic solutions, which have been the subject of research by several groups over the past 10–20 years. The chloride-free formulations rely on a "chloride shift" to establish a Donnan equilibrium between the charged ions in the intracellular and extracellular medium. Thus in a chloride-free medium, *intracellular chloride will leave the cell and in the absence of any other diffusible anion, hydroxide (OH-) will enter the cell and raise the intracellular pH".*)

The reason for bringing this concept up in terms of the DMT/Gamma wave discussion is based on our 2015 interview with Dr. Rick Strassman in which he stated that it's been known for 60 years that DMT is produced in the lungs. The fact that Chloride Shift takes place in the lungs which might possibly correlate with an increase of "Fourth Phase Water" formation is intriguing to us based on our viewpoint of the electrical changes within the body and brain that appear to correlate with DMT synthesis. We must remain cognizant that one breakthrough within the body doesn't necessarily happen separately from another breakthrough within the body. There appears to be a synergistic component to all of this which should help us understand ourselves better.

(It's interesting to note that Q4LT has attributed respiratory alkalosis as a potential precursor to DMT synthesis and that the blood within the lungs has been cited to remain at a pH of 7.6 which is elevated compared to blood found throughout the rest of the body. Maybe DMT formation within the lungs is pH dependent and can be replicated in other areas/organs of the body when the pH/ionic parameters are in proper balance?)

We tend to believe that the organs in our endocrine system secrete a specific set of hormones in specific amounts based on an innate sensor that measures electrical

potential of the plasma and cells. Since these organs have direct contact with blood and since the blood cycles throughout the body within one minute, hormonal secretion could potentially fluctuate dramatically in a short time frame. In 2009, the Journal of Biological Chemistry outlined a study observing changes in Pineal Gland gene expression profile (over 600) between mid-night and mid-day. We tend to believe that this has as much to do with respiration rate and EEG state if not more so than simply darkness. This study within itself might supply some valuable data as to the genetic mechanisms involved in the synthesis of the enzyme related to endogenous DMT.

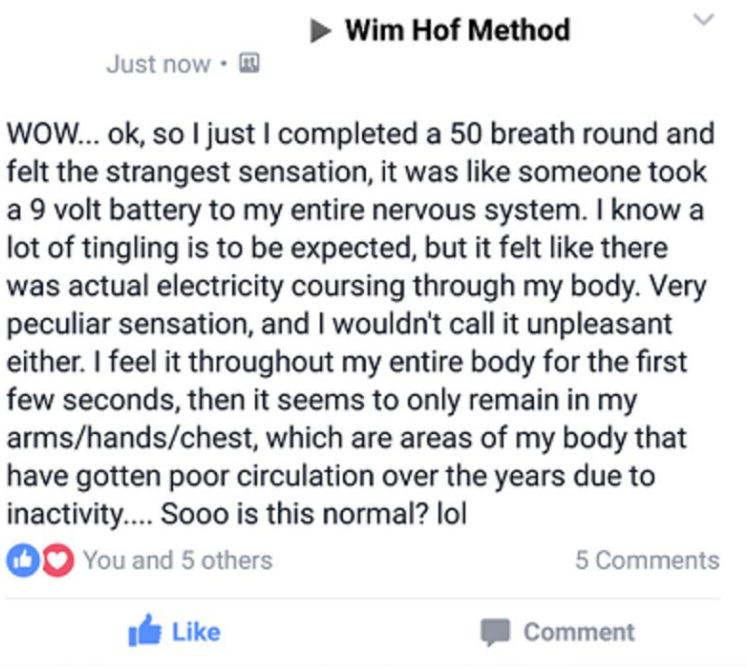
A recent 2016 study published in the journal Science observed the fact that salts in the brain play a pivotal role in the sleep-wake cycle of mice (and presumably humans). They found that potassium ions are elevated in the extracellular fluid within the brain when the mice were awake and suppressed when the mice were asleep. They found an inverse correlation with magnesium and calcium compared to potassium. This is a significant finding as many neuroscientists long held the belief that neurons generated the changes in extracellular salt concentration rather than extracellular composition dictating neuron activity. It's interesting to note that the effects of respiratory alkalosis also lead to suppressed levels of blood potassium levels (hypokalemia) as seen in the brain during sleep.

(I came across a passage in Dr. Walter J. Freeman's book "Neurodynamics: An Exploration in Mesoscopic Brain Dynamics" in which he wrote, "Histamine may also enable interneurons to switch between excitatory and inhibitory actions by controlling the uptake and intracellular concentration of chloride ions, thereby accounting for the emergence of Gamma Waves in the EEG shortly after birth, and on waking from deep sleep." I would send an inquiry to Dr. Freeman regarding whether the formation of Gamma waves indicated an inflow or outflow of chloride ions within the neuron. He would reply, "Measurement of Cl- ionic transmembrane gradients is very difficult. Not often done, so I can't answer your question. Good topic for a PhD thesis." Since them I've come across additional information regarding chloride ions being directly correlated with gamma-Aminobutyric acid (GABA) levels which appear to have a definitive impact on Gamma wave formation and amplification. It appears as though GABA reduces a neuron's action potential. A 2010 write-up in the Journal of Physiology would extensively discuss the relationship between Chloride ions and GABA's ability to depolarize neurons. Interestingly enough, in an e-mail exchange with DMT researcher Dr. Ede Frecksa, he would cite a 1994 study in the journal Brain Research in which DMT administered to cats also reduced action potentials. While much of these technicalities are beyond my scope of comprehension, perhaps there is a link between

an increased level of chloride ions in the blood and subsequently CSF via increased respiration rate which correlates with endogenous release of DMT?)

While the concepts of Chloride Shift, “4th Phase of Water”, 600+ pineal gene expression changes and ionic fluctuations in the brain during sleep might not seem to be directly related in terms of DMT & Gamma Waves… I believe they are. They are simply different layers of the same “cake”… ionic, genetic, and electric (4th phase). Many of the reports that correlate with the DMT experience cite significant sensations as it pertains to electricity within the body. If we are to have a better grasp of what role the “Spirit Molecule” plays within us, it might behoove us to think in a more holistic manner rather than reducing it to neuronal firing.

(An “electric” experience reported from a Wim Hof Method practitioner)



13. Dopamine-Melatonin Seesaw

It’s been quite extensively observed that Melatonin and Dopamine operate as antagonists to one another. While the level of one compound rises, the level of the other falls (and vice versa).

It would appear that in terms of EEG correlates… the slower brain waves (Slow Alpha, Theta, Delta) tend to signify increased Melatonin production and faster brain waves (Gamma, Beta, High Alpha) tend to signify increased Dopamine production.

As cited in previous pieces, it appears as though "phase-coupling" takes place during REM sleep in which slower brain waves (Theta/Delta) occur simultaneously with bursts of faster brain waves (Gamma). This would theoretically signify bursts of Dopamine production while Melatonin levels remain elevated. The fact that this would occur during our predominant "dream state" potentially correlated with DMT release might provide additional perspective on the mechanics of what is transpiring during these experiences.

(A 1977 study published in the journal Life Sciences showcases increased production of striatal dopamine due to exogenous DMT administration in lab rats.)

14. Mental Illness or Unquantifiable Insights?

The general tendency for a person who has come across the concept of endogenous DMT is to attribute mental illness and subsequent hallucinations to this molecule. This is not entirely unfounded as it would appear to make somewhat logical sense that a person producing greater measurable quantities of DMT would likely be in a perpetual state of altered perception compared to the norm. However, since we tend to utilize scientific documentation to support our theories (sometimes), there appears to be conflicting data in terms of this discussion.

In 1975, the American Journal of Psychiatry would publish a study involving schizophrenic patients compared to control subjects. The results were as follows: "They found that 26 acutely schizophrenic patients were no more likely to have bufotenine or N,N-dimethyltryptamine (DMT) present in urine or elevated serum indolethylamine N-methyltransferase activity than 10 normal control subjects. The authors conclude that these are naturally occurring substances which are equally likely to be present in normal and schizophrenic subjects."

In 1976, the journal Psychopharmacology published a paper comparing the levels of DMT in schizophrenic patients and control volunteers utilizing gas chromatographic-mass spectrometric determination with similar results showcasing no correlation with DMT levels and schizophrenia.

In 1976, the journal Psychological Medicine would publish a study involving the comparison of DMT urinary excretion levels involving 122 psychiatric patients compared to 20 normal subjects. The results were as follows: "The operational definitions failed to reveal any group significantly more correlated with urinary DMT than a hospital diagnosis of schizophrenia, but a discriminant function analysis of symptomatology could be used to define a group of 21 patients of whom 15 (71%) excreted detectable

DMT. There was a general relationship between psychotic symptoms and urinary DMT, but specifically schizophrenic symptoms did not appear to be major determinants of DMT excretion."

In 1978, the British Journal of Psychiatry would publish a study outlining the levels of DMT in the cerebrospinal fluid of psychiatric and control populations. The results were as follows: "Some schizophrenic patients have higher levels of both amines than do controls, though the differences in distribution did not reach statistical significance in the sample studied."

It would appear important to not only take into account the endogenous hormonal differences of the "mentally ill" but to additionally analyze their physical brain structures. In Chapter 2 of the "DMT & Gamma Waves" series, we outlined the observation of Corpus Callosum (CC) robustness as it pertains to generally observed functionality. We cited the findings of Albert Einstein's significantly thicker CC, increased intelligence & hypnotizability coinciding with CC (size/thickness), as well as the studies citing the ability for meditation to increase CC thickness.

In 1995, the Journal of Neurology, Neurosurgery and Psychiatry would publish a meta-analysis of 11 separate studies of Corpus Callosum morphology in schizophrenia. This was done in order to quantify whether there was a significant difference in corpus callosum size between schizophrenic patients and normal controls. The analysis was based on 313 patients with schizophrenia and 281 controls. The results were as follows: "Measures of corpus callosum midsagittal area, length, and corpus callosum area:brain area ratio were used in the meta-analysis. There was overall a statistically significant reduction in corpus callosum area in schizophrenic patients compared with controls ($P < 0.02$)."

In 2000, the journal Schizophrenia Research published a study outlining the shape and size of the Corpus Callosum in Schizophrenia and schizotypal personality disorder. The study would conclude: "The decreases in corpus callosum size in schizophrenia varied directly with length of illness, perhaps indicative of a progressive process. The patient-control differences in callosum size and shape are consistent with a hypothesis of decreased connectivity between the left and the right hemispheres in schizophrenia and SPD."

In 2010, the journal Biological Psychiatry would publish a study regarding Corpus Callosum abnormalities and their association with schizophrenia. The results were as follows; "The schizophrenic patients exhibited a variety of diffusion abnormalities in the

corpus callosum, which were related to the severity of their psychotic symptoms. To the extent that diffusion abnormalities influence axonal transmission velocities, these results provide support for those theories that emphasize neural timing abnormalities in the etiology of schizophrenia."

In 2010, the Journal of Psychiatry and Neuroscience published a paper referencing multiple studies regarding Gamma waves and Schizophrenia. The results appear to remain consistent that the power of Gamma waves for patients with schizophrenia are reduced compared to control subjects. The authors believe that the lack of Gamma wave amplitude correlates with the inability to combine information from different brain regions.

Based on the presented studies, it would appear that "mental illness" is not predominantly predicated on an abnormal level of endogenous DMT but rather a degradation of brain structures that negatively affects interhemispheric connectivity & communication. It would seem rather illogical to group the transcendental experiences of long-time meditators, hypnotherapy patients, etc. with that of "mentally ill" being that their physical brain structures would appear to exude opposite characteristics. There also appears to be an opposite level of Melatonin in meditative practitioners which appear elevated (Medical Science Monitor - 2004) compared to suppressed levels in schizophrenics (Metabolic Brain Disorders - 2012). Just a wild postulation (once again)… but the inconclusiveness of the DMT measurement studies as it pertains to "mental illness" could have to do with certain patients experiencing altered states due to atrophy of brain connectivity (with the inability to assimilate perception) while other patients experience perspective changes based on enhanced inter-connectivity of the brain or a rewiring of sorts. This situation would then lead to what is "classified" as hallucinatory or delusional phenomena while exuding much different hormonal and physiological parameters. The brain as is the body is ultimately infinitely complex to say the least…

(In 2012 psychiatrist Dr. Joseph Polimeni published a book titled "Shamans Among Us". The book gives an alternative perspective on schizophrenia citing its occurrence as a modern manifestation of tribal shamans. There is also the perspective of West African shaman, Dr. Malidoma Some´ who states that in the culture of the Dagara people, "schizophrenics are not viewed pathologically, but often as mediums bringing messages to the community from the spirit world." Here is an excerpt from a 2014 Waking Times article documenting Dr. Some´'s experience:

One of the things Dr. Somé encountered when he first came to the United States in 1980 for graduate study was how this country deals with mental illness. When a fellow student was sent to a mental institute due to "nervous depression," Dr. Somé went to visit him.

***"I was so shocked. That was the first time I was brought face to face with what is done here to people exhibiting the same symptoms I've seen in my village." What struck Dr. Somé was that the attention given to such symptoms was based on pathology, on the idea that the condition is something that needs to stop. This was in complete opposition to the way his culture views such a situation.*)**

Perhaps schizophrenia is the abrupt formation of a neural pathway that leads to insights of information derived from currently undetermined sources and proper treatment is necessary for assimilation into the current, consensus reality in order to integrate the info?

It's complicated…

(A recent study published in May 2016 in the journal Psychology Medicine observed the fact that the brains of patients diagnosed with schizophrenia appear to be actively regenerating. In 2013, a paper published in the Journal of Neural Transmission proposes that DMT plays a role in tissue protection and regeneration. Perhaps elevated levels of DMT within some schizophrenics is not the cause of the disease but rather a part of the regenerative mechanisms needed to regenerate the neural pathways lost due to atrophy?)

15. Channeling

While I'm not quite well versed in the differences between "Channeling" and the "regular" psychic mediumship experience, it appears as though a "channeler" will have their mental consciousness taken over by the "entity" being "channeled". It all seems rather far-fetched but at the same time… if we can take in the entire body of presented studies including the potentiality for telepathic communication and its subsequent mechanisms, perhaps it isn't so far-fetched. A 2014 study published in the journal Neuron would showcase that brain circuits can tune into the frequency of other brain parts via a "tuning knob". What's to say that a person's brain is incapable of tuning into frequencies which transmit information originating outside of their brains?
If we are to be open to the possibility that the brain operates as an antenna that receives information rather than generating information, then the concept of

“Channeling” might not seem so strange. It’s interesting to note that one of the more well known channelers named “Bashar” (Real name Daryl Anka) claims to have been EEG tested and subsequently showcased Gamma wave formation throughout his session. If anything, it would appear that much like Edgar Cayce, “channelers” are able to maintain a sustained level of hypnagogia utilizing phase coupling of slower waves to generate faster waves. This would appear rather similar to some of the observations regarding a 2002 study in the journal Perceptual and Motor Skills featuring the “Remote Viewing” capabilities by Ingo Swann. Whether these methods of generating information can ever be scientifically “proven” is a different discussion altogether.

Let me rephrase that… whether these methods of generating information can ever be mechanistically deciphered by our latest technology is a different discussion altogether. In any case, Mr. Anka does provide some interesting insights regarding DMT during his sessions found here and here.

16. Hollywood or Science… ET Experiences?

Dr. John E. Mack was a Pulitzer-Prize winning biographer, a psychiatrist, and a tenured professor at Harvard University. In the 1990s, Mack would embark in a decade-plus study of 200 men and women who claimed to have had episodes in which they had encounters with “aliens”. He initially presumed that these people who claimed to have had “alien encounters” were likely suffering from mental illness. However, as he investigated further and found no obvious origin or observation of mental disease, he continued to probe.

Dr. Mack would utilize regression hypnosis in order to assist the participants to recall their experiences in great detail so that he would be able to build a framework of what this experience truly signified. Mack would go on to publish two books on his study titled “Abduction: Human Encounters with Aliens” and “Passport to the Cosmos”. He would even appear on the Oprah Winfrey show to speak openly about the subject. His in-depth research into the subject would create some backlash at Harvard University which has been documented on Mack’s Wikipedia page.

Dr. Rick Strassman’s study would also showcase reports of “alien-like encounters” when they were administered the higher level doses of DMT. Strassman would co-author a book titled “Inner Paths to Outer Space” which would present the link between the alien experience and psychedelic research. Many reports of “ET encounters” have consistently surfaced from people from all over the world who have ingested the shamanic brew known as Ayahuasca.

Dr. Brian Weiss (who we cited in Part 3 of Gamma Waves & DMT) unexpectedly encountered patients who (under hypnosis for "past life" regression) would spontaneously discuss alien encounters. He outlines some of these experiences in his book "Same Soul, Many Bodies".

Dr. John C. Lilly (creator of the sensory deprivation/flotation tank) would also document alien-like experiences in his book "Center of the Cyclone: Looking into Inner Space" when immersed in sensory deprivation as well as ingesting psychedelic substances. He'd additionally postulate that dolphins were of an order of intelligence more sophisticated than humans.

Many lucid dreamers, people who experience "sleep paralysis", long-time meditators of various disciplines, Out-of-Body Experiencers, and even Near Death Experiencers have all reported variations of the "alien" experiences.

While the "alien" experience can seem rather disconcerting to average person's beliefs systems, it is rather intriguing that "higher" states of consciousness and brain activity appear to pertain to these experiences. While the fields of UFO and extraterrestrial study are extremely in-depth branching out into wide subsections, when browsing the vast array of literature and video, the question still persists… is it real?

It's quite easy to automatically cite the Hollywood narrative of "aliens" and shrug off the phenomena altogether. However… the world of screenplay bears no role in the legitimate scientific mindset.

If the alien experience is not "real" and simply an unexplained, ingrained part of our psyche, then we could possibly discount the experiences as potentially common and consistent DMT-induced "hallucinations". Many supporters of the alien phenomena will cite the "Phoenix Lights" or "Roswell" as proof of alien existence outside of our minds. Some will even point to the thousands of videos on YouTube in which people capture strange light formations in the sky. In this age of technology it is extremely difficult to decipher what is exactly a true, unexplained aerial phenomenon and what is a cleverly designed hoax by talented video editors.

There are some people claiming that the formation of designs known as "Crop Circles" provide undeniable proof that extraterrestrial activity on earth is real. There is much controversy surrounding this phenomena as the "official" story states that these intricate designs are created by sometimes as little as two people in the middle of the night

utilizing simple tools such as ropes and wooden planks. Proponents that believe that there are ET origins of legitimate crop circles state specific anomalies in the plants such as abnormally shaped and bent plant nodes hypothesized to transpire from exposure to heat and radiation.

Dr. Steven Van Nocker and his class of undergraduate students from Michigan State University would attempt to replicate a few Crop Circle plant anomalies utilizing the tools of ropes and boards without success (as witnessed in the documentary Paranatural: Crop Circle). In 2011, physicist and professor at the University of Oregon Dr. Richard Taylor would provide commentary regarding Crop Circles in the publication Physics World. A summary of the article provided by Discovery News states:
"Richard Taylor believes that physics could hold the answer. He suggests that crop-circle artists might be using a Global Positioning System (GPS), as well as lasers and microwaves, to create their patterns, dispensing with the rope, planks of wood and bar stools some used in the past."

"Taylor suggests that artists could be using microwaves to make crop stalks fall over and cool in a horizontal position – a technique that might explain the speed and efficiency of the artists and the incredible detail of some patterns."

So which one is it? Do ropes and boards explain the tools for design formation or are there more sophisticated techniques and equipment which explains the abnormal microwave radiation (which wouldn't occur from the use of ropes and boards) emanating from some of these designs? It's important to note that Crop Circles have been documented historically dating as far back as 1678 as outlined by Tara MacIsaac of the Epoch Times.

The famous quote by the "Skeptic's skeptic" Dr. Marcello Truzzi states **"extraordinary claims require extraordinary proof"**.

If two men claim to be able to have designed the crop circle (down below) in the middle of the night under minimal light conditions, I would rationally believe this to *definitely* be an extraordinary claim. It doesn't necessarily equate to believing that this formation has ET origins but rather that the claim itself is quite extraordinary based on the extreme precision (409 circles in complete symmetry, 700 feet in diameter), speed of completion (4-6 hours), and working conditions (darkness of night). If the designer's claim was based on weeks of work in the daylight utilizing advanced equipment to make each design, the claim would definitely be considered less extraordinary by comparison. It wouldn't take much to put this controversy to rest as an artist or group of artists would

simply need to create an exact replica within the same time frame of this formation on camera in front of the predominant crop circle-ET proponents.

(This Crop Circle formation has been named “The Catherine Wheel”.)

17. The “God” conversation

An Atheist refers to a person that has a lack of belief of any higher power or “God”.

One of the more amusing yet profound quotes (provided by one of the volunteers in the trial) from the book “DMT: The Spirit Molecule” was… **“You can still be an atheist until 0.4”.** This refers to the fact that at the lower levels of DMT administration an atheist could brush off the experiences to hallucinatory visions of the mind. However, at the highest level of DMT administration, a "non-believer” or atheist would have such a profound experience that they’d somehow become open to the concept that a “higher power” or “God” actually exists. This doesn’t necessarily refer to any specific religious

discipline. In terms of science, the two fields that attempt to place the “religious” or “spiritual” experience in context are that of Neurotheology and Theoneurology.

Neurotheology attempts to explain religious experience and behavior in neuroscientific terms. It is the study of correlations of brain activity with subjective experiences of spirituality and hypotheses to explain these phenomena. Proponents of neurotheology say there is a neurological and evolutionary basis for subjective experiences traditionally categorized as spiritual or religious.

Theoneurology is proposed by Dr. Strassman based on his hypothesis that the brain has been designed to communicate with God. Strassman believes that DMT could be involved in playing a role in terms of “mediating the phenomenological contents — visions, voices, emotions, etc.— that accompany the interactive religious experience with God.”

It would appear that when addressed in a singular conversation/perspective, the notion of “God” would appear rather impossible to prove (or disprove for that matter). However, when we begin to include all the phenomena outlined in our 6-part series of DMT/Gamma waves as well as our Wild Theories series (assuming we have provided sufficient framework for potential replication), it makes one question what the ultimate truth is.

If a person can alter the Direct Current flow within their brain inducing hemispheric cohesion while subsequently synthesizing DMT endogenously that causes a unique electrical charge within the body leading to the possibility to alter membrane potential of diseased cells equating to “miraculous” healing… does that mean “God” exists?

If during a similar electrical and biochemical state a person can reliably replicate telepathic transfer of thought or induce a measurable, quantifiable “Out of Body” experience… does *that* mean “God” exists?

What about the ET experiences or psychic mediumship that facilitates communication with the deceased? If by chance there is one ounce of reality to these experiences… does *that* mean “God” exists?

If we someday are able to replicate all of these “supernormal” abilities across the general population as well as document the precise cellular, electrical, genetic, enzymatic, and biochemical mechanisms taking place during these feats does that mean “God” *doesn’t* exist?

(A 2016 study published in the journal Epilepsy Behavior outlined the opportunity to "record the brain activity of a man at the exact moment he saw God". The results were as follows: "Topographical analysis of the bandpass filtered EEG epochs revealed increased activity in the low-gamma range (30-40Hz) during religious conversion compared with activity during the patient's habitual state.")

While the discussion of a "higher power" tends to repulse scientific minds based on underlying connotations of religion, it doesn't appear logical to dismiss the discussion altogether based on emotional distress. It would seem that it'd be much more effective to provide a more palatable framework for the conversation. While the field of science has done an excellent job of dissecting and explaining certain detailed mechanisms, the field and people within it might be better served to understand the roles of the scientific discipline… which is the explanation of the details and how they interlock with one another. To attempt to utilize the mechanistic explanations and interject them as encompassing the total seems a bit overreaching.

We've touched upon this in a previous musing titled "Mechanisms or Meanings?"

This is especially pertinent when many prominent minds within numerous scientific fields have no basic knowledge or perspective regarding DMT's role within their own physiology. We can utilize all the latest technology to decipher changes in cellular structure, glymphatic system fluctuations, ionic changes, neuronal network alterations and similar detailed mechanisms taking place within the brain during sleep but we *still* cannot explain the reasons *why* we experience dreams as these components interact. From a purely mechanical perspective of life assuming we are merely a flesh and bone result of evolution, there appears to be no logical reason why we must experience these hallucinations known as "dreams" during sleep.

Perhaps we've explained 0.01% of all there is to know and we have 99.99% left to figure out. As far as I'm concerned, when examining the state of the global population it would seem rather arrogant to assume that we have so much figured out when there is still such a wide array of unnecessary issues pertaining to economics, healthcare, food quality, sociological, environmental sustainability, inequality, violence, and the dozens of other fields that could be named.

(While this hypothesis might seem strange… it wouldn't surprise me if many of the most famous spiritual figures within human history (regardless of religion) might have had distinctly different brains than the average person. I postulate that they likely exuded significantly thicker Corpus Callosums, definitively robust

neural network connections across the entire brain, as well as potentially having been able to generate a combination of Epsilon Waves (0.5 Hz and lower) and Lambda (200 Hz and higher) while in a regular waking state. This theory is based on the "off the chart" Gamma waves measured in Buddhist Monk Matthie Richard as well as other intense meditative practitioners. These spiritual figures with distinctly different brain structures and electrical activity might explain their ability to consistently perform "supernormal" feats.)

One of the arguments against the concept of "God" that consistently sprouts up is… "if there is a God, why do bad things happen to good people?" This is not an illogical question to propose. However, perhaps in order to answer that question it would require a person to delve deep into the complexity of non religious based literature of a spiritual nature in order to make some sense of "young children born into abusive poverty and adolescent cancer cases". Keep in mind that the rabbit hole regarding this field runs infinitely deep where there is much difficulty in "separating the wheat from the chaff".

I'm of the belief (which could be completely naive) that levels of complexity provide reliable markers of the intelligence of the designer(s). It is rather safe to say that nothing that humans have created (including the internet and everything it encompasses from content to hardware) can compete with the absolute complexity of nature and everything residing within it on earth and throughout the universe. To quote an amusing meme I've come across "To believe that there was once absolutely nothing, and that nothing happened to nothing until that nothing exploded creating everything and everywhere which subsequently rearranged itself into self-replicating bits which evolved into dinosaurs" seems a bit far-fetched.

When we claim to have a logical, scientific grasp of the complexity of how the Universe was created based on explosions that took place billions of miles away, billions of years ago yet we cannot properly address disease which takes place within our own bodies makes one question the grandstanding of perceived knowledge just a bit.

Nevertheless… it does seem that in 2016, with the amount of information available and the interconnectivity of people, it would appear that the "God" conversation could retain intellectual parameters that might satisfy the atheistic "intellectual" as well as the spiritual seeker.

But that's just me…

XII. Heart-Brain Connection

This could have been squeezed into the “Wild Theories” series but I forgot so consider this an “add-on”.

The scientific community looks at the brain as though it is the definitive generator of thought and subsequent actions carried out by the body. It’s not illogical as the concentration of neurons in the brain (100 billion) is by far the most concentrated found within the body. However, while it may sound a bit cheesy to think about the heart in terms of intelligence, there are some intriguing findings as it pertains to this mass of beating muscle located within the chest cavity. While the heart lacks the neuronal density of the brain, it has been cited to house about 40,000 neurons.

In 2002, the Journal of Near-Death Studies published a study in which heart transplant recipients were evaluated in terms of changes to their personalities that parallel that of the donors. The study consisted of 10 patients (7 males, 3 females ranging from 7 months to 56 years old). Their donors consisted of 5 males, 5 females ranging from 16 months to 34 years old. The results & conclusion were as follows: “Two to 5 parallels per case were observed between changes following surgery and the histories of the donors. Parallels included changes in food, music, art, sexual, recreational, and career preferences, as well as specific instances of perceptions of names and sensory experiences related to the donors (e.g., one donor was killed by a gunshot to the face; the recipient had dreams of seeing hot flashes of light in his face). The incidence of recipient awareness of personal changes in cardiac transplant patients is unknown. The effects of the immunosuppressant drugs, stress of the surgery, and statistical coincidence are likely insufficient to explain the findings. The plausibility of cellular memory, possibly systemic memory, is suggested.”

In what is considered one of the most famous cases of cellular memory inheritance via a heart transplant, a woman named Claire Sylvia would author a book titled “Change of Heart”. A summary of her experience was published in Journal of New Approaches to Medicine and Health: “On May 29, 1988, an American woman named Claire Sylvia received a heart transplant at a hospital in Yale, Connecticut. She was told that her donor was an eighteen year-old male from Maine, USA who had just died in a motorcycle accident. Soon after the operation, Sylvia declared that she felt like drinking beer, something she hadn’t particularly been fond of. Later, she observed an uncontrollable urge to eat chicken nuggets and found herself drawn to visiting the popular chicken restaurant chain, KFC. She also began craving green peppers which she hadn’t particularly liked before. Sylvia also began having recurring dreams about a

mystery man named Tim L., whom she felt was the organ donor. On a cue from someone, she searched for obituaries in newspapers published from Maine and was able to identify the young man whose heart she had received. His name had indeed been Tim. After visiting Tim's family, she discovered that he used to love chicken nuggets, green peppers and beer."

These are rather intriguing reports as it leads one to question whether thoughts and feelings only originate in the brain or whether the heart might play a definitive role in a tangible, measurable way.

In 2013, the journal Frontiers in Human Neuroscience would publish a study regarding relationships between the heart and brain during autogenic meditation amongst beginning meditators. The results were as follows: "all parameters observed in this study were indices reflecting a degree of ordering or self-organization; heart coherence, EEG alpha activities and the synchronizing relationship between heart coherence and EEG variables."

In 2016, the journal Neuroscience Letters published a study regarding the heart/brain relationship Mindfulness-Based Stress Reduction (MBSR) training. The results were as follows: "Wavelet entropy analysis indicated that MBSR mindfulness meditation could reduce the chaotic activities of both EEG and heart rate as a change of state. However, longitudinal change of trait may need more long-term training. For the first time, our data demonstrated that the chaotic activities of the brain and the heart became more coordinated during MBSR training, suggesting that mindfulness training may increase the entrainment between mind and body. The 3D brain regions involved in the change in mental states were identified."

In 2012, BioMedical Engineering and Sciences would publish a paper that cited the rhythms of the heart and brain during sleep. The results were as follows: "Phase synchronization is a measure of interaction between phases of two chaotic systems although their amplitudes are uncorrelated. Here, we investigate the synchronization between heart signals and EEG frequency bands (delta1, delta2, theta, alpha1, alpha2, sigma, beta and gamma) during sleep Stage 1-4 and REM in the healthy and sleep apnea by means of Synchronization Index (SI) and Directionality Index (d). The results showed that in both groups and all sleep stages, there was a strong unidirectional coupling from brain to heart."

If both sleep and meditation are correlated with the potentiality for DMT release as well as Direct Current directional change in the brain, it would appear that there lies the

possibility that heart/brain coherence might play a pivotal role in DMT synthesis as well as fluctuations in the electrical flow throughout the body.

There might be some correlation regarding heart/brain coherence and the 2015 study in the journal Science that we cited in part 2 of “Wild Theories” citing the potential for 1,000 gene mutations for each neuron. This passage in particular:

“The scientists isolated and sequenced the genomes of 36 neurons from healthy brains donated by three adults after their deaths. For comparison, the scientists also sequenced DNA that they isolated from cells in each individual’s heart. That effort yielded mountains of data, and Walsh’s group teamed up with Park and Semin Lee, a postdoctoral fellow in Park’s group, to make sense of it all.”

“We could identify mutations that happened really early, before the brain existed, and we found that cells that had those mutations were nestled next to cells that had totally different mutations,” Woodworth says. In fact, the scientists found, a particular neuron might be more closely related to a cell in the heart than to a neighboring neuron.“ Perhaps if a person’s heart and brain are operating in sync, this would then equate to neurons in the heart and neurons in the brain being expressed the same from a genetic standpoint?

In 2004, the book titled Bioelectromagnetic Medicine was published which would include a chapter titled "The Energetic Heart” by Dr. Rollin McCraty. McCraty would cite a 1989 study published in the journal Advances in Biomagnetism which measured the electromagnetic field of the heart and brain.

From “The Energetic Heart”:
“The heart generates the largest electromagnetic field in the body. The electrical field as measured in an electrocardiogram (ECG) is about 60 times greater in amplitude than the brain waves recorded in an electroencephalogram (EEG). The magnetic components of the heart’s field which is around 5000 times stronger than that produced by the brain, is not impeded by tissues and can be measured several feet away from the body with Superconducting Quantum Interference Device (SQUID)-based magnetometers.”

The one “wild theory” I’ve intuitively come across in regards to Gamma waves is that the electromagnetic strength of the heart acts as the amplifier to an idea. In essence, if a thought resonates in the heart which correlates with a neuron, that message gets sent to the brain creating a Gamma Wave spike. The larger the group of neurons in the heart

focusing on a specific concept, the greater the surge of electricity, Gamma Wave spike, and CSF flow to the brain. When taking in the entire body of data, it would appear that in order to tap into this potentiality, one would need to quiet the mind to "listen" to the heart. It all sounds very esoteric but once again… this is theoretical postulations based on the best available data that we have currently.

Dr. Paul Pearsall was one of the most extensive researchers and writers as it pertains to heart transplant memories. While not all heart transplant recipients would undergo dramatic personality changes if any, he did cite some commonalities in people who did seem more susceptible to personality changes. Dr. Pearsall would cite 18 distinguishing traits for these people including good emotional IQ, environmentally sensitive, sensual, animal lovers, music-loving, creative types, and more inclined to be easy going. He notes that these traits were similar to the characteristics of easily hypnotized subjects. The vast majority of the subjects who experienced distinct personality changes were women.

This is rather intriguing based on our review of the Corpus Callosum and how it relates to hypnotizability, intelligence, and meditation. A 1995 study in the journal Neuroreport would cite that "forebrain volume-adjusted size of the corpus callosum was larger in women than in men".

It almost seems as though the greater the Corpus Callosum… the greater the hemispheric communicative potential… the slower the dominant brain waves… the greater the ability to tap into the messages from the heart which might induce a Gamma wave spike. As counterintuitive as it may sound, it would appear extremely important to be able to tap into the amplification strength of the heart in order to maximize one's full intellectual capacity. There are numerous recent observations published in multiple scientific journals outlining the link between Dementia and Alzheimer's disease (which have both been linked to Corpus Callosum atrophy) and a desynchronization of the heart/brain connection/rhythm: Cardiovascular Psychiatry and Neurology (2009), Netherlands Heart Journal (2012) & (2013), and the Journal of Alzheimer's Disease (2014).

I don't believe it is a coincidence that sleep and meditative states lead to increased coherence between the brain/heart which just so happen to revolve around states that appear to be distinctly related to DMT synthesis. Perhaps that is a sickness of society… too much cerebral activity… not enough heart based intellectualism.

I think the heart might just be the key to unlocking secret pathways that lie within the mind.

(The complexity of the human body is immense especially as it pertains to dynamics of the communications of organs and constant fluctuations based on input parameters. It wouldn't surprise me if the entire endocrine system and even the digestive system somehow played a role in DMT synthesis if the conditions were ideal. We've touched upon the primary suspects but I'm sure it goes much, much deeper than everything we've presented.)

PS. To stay in the esoteric lane… it's amusing that the circulation of blood in the heart appears to flow in a figure 8 pattern. That's an "infinity" sign for the spiritually inclined. The fact that the Journal of Psychiatry published a paper in 1973 citing that DMT forming enzymes were found in human red blood cells (RBCs) and that RBCs undergo intracellular pH increases from Chloride Shift which then travel the "figure 8" through the heart prior to reaching the brain lead us to believe that there is some magic going on there. Wild unadulterated speculation… yes.

XIII. 16 Questions with Dr. Rick Strassman

Dr. Rick Strassman M.D., author of DMT: The Spirit Molecule & DMT & The Soul of Prophecy in addition to co-authoring Inner Paths to Outer Space. His undergraduate studies occurred at Pomona College and Stanford University, medical training at Albert Einstein College of Medicine of Yeshiva University, psychiatry residency at UC Davis, and psychopharmacology fellowship at UC San Diego.

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Begin Interview (Published April 24, 2015)

JC: It has been 15 years since your book "DMT, The Spirit Molecule" has been published. It covers aspects such as the trials and tribulations of the various administrative branches of the government you had to work with in order to get your studies approved. It also documents your experiences in finding the proper dosage to optimize patient experience, documenting patient experiences, and the results/aftermath of your study itself. Would you have changed anything about that experience if possible?

Dr. Strassman: I wouldn't have changed anything about the design of the initial DMT study. It needed to be a meticulously designed and executed dose-response study, rather than psychotherapeutic. And the follow-up study attempting to develop tolerance to closely spaced repeated injections of DMT, a natural follow-up within the psychopharmacological model, was incredibly interesting. I was however, increasingly constrained by that model as my studies progressed. That is, I needed to begin attempting to identify the specific receptor mechanisms mediating the DMT effect, and that would require a blockade of particular aspects of the DMT experience. These latter studies were difficult to recruit for and were frustrating for both the volunteers and me because of their focus on attenuating the DMT effect. Lack of colleagues in other disciplines, such as psychotherapy or substance abuse treatment, also limited my options at a certain point.

In retrospect I needed a better team around me. Both within the department of psychiatry and the research center. I had for so long been used to being a lone voice in the wilderness that once my study actually got underway, it was difficult to ask for the help and support that I obviously needed in shouldering the responsibility for such a complex project.

JC: What has been the overall feedback from the general public, the scientific community, and the spiritual community since then?

Dr. Strassman: The general public has been quite enthusiastic about the DMT work. The original DMT book—DMT: The Spirit Molecule— has sold 150,000 copies, and generally sells more every year. The DMT documentary based on my work and with the same name as the book, has been enormously popular and successful, too.
The scientific community was caught unprepared for my work as it seemingly came out of nowhere after a 20 year hiatus of such research in the U.S. As an indication of this, I took another ten years after I finished my study before the Johns Hopkins work with psilocybin began being published. When I presented my data in the early 90s it was met mostly with some bemusement by the older generation of researchers or bewilderment by my contemporaries, but no hostility.

As I describe in the DMT book, my Zen community did not take well to my research nor writings about it, but ultimately that was a silver lining since it freed me to return to my own spiritual roots in order to find a more cogent model for the DMT effect. That model I articulate in my new book about the DMT state vis-à-vis the prophetic experience recorded in the Hebrew Bible;DMT and the Soul of Prophecy.

JC: One of your theories is that DMT gets released in the brain and/or quickly synthesized in the Pineal Gland upon the moment of death. Have you developed this

theory to tie in your own beliefs as to “spirituality” and why humans exist and our creation in totality?

Dr. Strassman: We have known for nearly 60 years that the lungs make DMT. I marshaled a lot of circumstantial evidence in the DMT book for a pineal role in DMT synthesis, but this was only established a couple of years ago. We still do not know whether DMT activity increases as we die. However, to the extent that the subjective correlates of the dying process share features with the DMT state, it makes sense that endogenous DMT may play a role.

I think that the universe, including humans, exist out of God’s beneficence, and once having created us, He would like us to know and love Him, to the extent that those concepts/words capture the essence of that “desired” relationship. In my new theory of theoneurology, I propose that the brain is so designed that we are able to communicate with God, and perhaps endogenous DMT is involved in mediating the phenomenological contents— visions, voices, emotions, etc.—that accompany the interactive religious experience with God.

JC: Many people from scientific backgrounds shun the notion of anything outside of our measurable, physical world existing. You have included DMT in some theories such as “Out of Body Experiences”, “Near Death Experiences” and “Alien Abduction Experiences”. It appears as though there appears to be a consistency in reports amongst people that have had an externally derived “DMT Experience” and those that have had some of these phenomena occur without ingesting DMT. Is it the consistency of anecdotal reports and statistics that led you to develop this theory or something else altogether?

Dr. Strassman: My original impetus to do the DMT work was noticing how similar the effects of psychedelic drugs were to descriptions of the effects of certain Eastern

religious meditations and near-death experiences. It seemed that there must be some common biological denominator. That is, perhaps psychedelic drugs and meditation techniques activated the same part of the brain, to the extent that the two syndromes resembled each other. I only became aware of the correspondences between the DMT experience and the alien abduction literature after finishing my study.

JC: In terms of EEG findings which would shed some light as to the brain functionality and brain wave types during DMT ingestion, have you seen anything that surprised your or any consistency that should be noted? I ask because different brainwave states appear to correlate with varying levels of different hormones being produced.

Dr. Strassman: We did some EEG work with DMT, but the data were not especially useful because of technical difficulties- a fine tremor muddied our ability to separate muscle artifact from brain wave changes. There are ayahuasca brain imaging and EEG data coming out of Jordi Riba's lab in Barcelona.

JC: I know that you have done extensive studies on Melatonin and it's effects on the body. While you found there was no psychoactive properties of Melatonin, have you studied any relationship between this compound and that of DMT? In our previous discussion, I informed you that I believed Melatonin could by transmuted into DMT from inducing Alkalosis. Any thoughts on that in particular?

Dr. Strassman: I performed my melatonin studies from 1985 to 1987. The primary psychological effect of high doses was sedation rather than more psychedelic-like effects, despite early suggestive evidence that these latter states might result. We did determine the first known role for endogenous melatonin in humans, which was the regulation of the minimum of core body temperature in the middle of the night.

We did discuss the hypothetical transformation of melatonin into DMT by alkalosis.. However, I am not familiar with this pathway. Dave Nichols in North Carolina may have something to say about that possible pathway as might Stephen Barker at LSU.

JC: In your theory of Theoneurology you propose that the brain is designed to communicate with God. Are you insinuating that the brain acts like an antenna? If so, would this insinuate that our brains inherently have the capability of receiving information in a “telepathic” manner?

Dr. Strassman: My theory of theoneurology suggests that God designed the brain in order for us to be able to communicate with Him and His intermediaries/angels. I think it is more complicated than simply an antenna; rather, perhaps a better analogy would be a television set which is able to display information received from an outside source using a number of different modalities. In the case of the brain, that would involve all of the components of subjective experience, including perception, cognition, emotion, and so on.

JC: It’s rather well known that the brain operates utilizing electrical conduction which has been studied extensively via EEG. I was curious about the role DMT played in possibly playing a role in enhanced electrical capabilities of the brain. After exchanging emails with Dr. Ede Frecksa & Dr. Meyer Jackson, I received clarification of DMT’s role in terms of sodium. It appears as though, DMT halts both the inflow and outflow of sodium in the cells. When studying the various mechanisms of respiratory Alkalosis it seems as though an end-point by- product is a decrease of Calcium Ions in the brain which causes an activation of sodium channels. What I’m getting at is… does it sound reasonable that DMT signifies a maximum intracellular sodium capacity which would equate to maximum voltage capacity which would equate to increased electrical capability of the brain? Does that make sense? Without DMT to regulate these sodium

channels it would appear that an over flux of sodium would drive into the cells causing them to potentially burst from too much water.

Dr. Strassman: Ha ha. That is simply beyond me. Ede is much better situated to address those questions.

JC: I'm not sure if you are familiar with the work and readings of Edgar Cayce. His name is rather controversial in scientific circles as modern science isn't entirely accepting of the fact that "seers" have legitimate capabilities. In any case, I was wondering if you have looked into any research regarding a gland known as the Leydig (or Lyden) Gland? Modern science does seem to accept that Leydig cells exist but do not seem to acknowledge the existence of Leydig glands found in both men and women in close proximity to the reproductive system. It doesn't seem to be as well known as the Pineal Gland but Cayce cited its importance when referring to the spiritual/energetic/electrical body. He even cited abnormalities of this gland as a reason for schizophrenia.

Dr. Strassman: Similar to my knowledge of sodium pumps, my knowledge of Edgar Cayce is even more rudimentary. All I can say for certain about him is that I know he existed and diagnosed and treated people using psychic powers.

JC: Based on your studies and reports documented in your book, many participants in the DMT experiment report a different outlook on dying after having experienced a full DMT experience. It seems as though some of them overcome their fear of death in totality. Can you explain why this is so? What are your own thoughts on the process of "dying" and do you believe in the concept of reincarnation?

Dr. Strassman: When all was said and done, I gave my volunteers only 2 pieces of preparatory advice regarding how to manage their high dose DMT experience: that it

was very rapid, and that they might believe they were dead. Regarding the latter piece of advice, I suggested there were 2 ways to deal with this: to panic and fight it all the way, or to keep one's wits about themselves and pay attention to where they were and what was happening.

This turned out to be good advice, because nearly all of the volunteers experienced a separation of consciousness from their body on the higher doses of DMT, and only a very small number experience initial panic during the transition into the full-blown state. This feeling of the mind separating from the body indicated to them that consciousness is able to exist in a non-physical plane, and provided many of them with reassurance that after the death of the body consciousness would survive.

In addition, I have speculated (although there are as of yet no objective data) that DMT may be released while people are dying. I marshal a lot of circumstantial evidence for this in my first book, "DMT: The Spirit Molecule."If this turns out to be the case, then it may be that a high-dose of DMT may occasion a "dry run" of the dying process. That is, one enters into a state that shares many features with what occurs during the actual dying process. This made intuitive sense to many of the volunteers, and after their high dose experiences of a disembodied but highly conscious state, they believed that they were more prepared for the dying process.

JC: The concept of "Out of Body" is foreign amongst mainstream scientific circles being that the concept of a "soul" or "spirit" has yet to be very well accepted.. However, there are boutique organizations such as The Monroe Institute and the International Association of Consciousness that specialize in this perceived phenomenon. What are your thoughts on reported "Out of Body Experiences"? Do you believe at some point these types of experiences will be "proven" in a clinical setting as being something more than simply a hallucination of the mind?

Dr. Strassman: Many of the discussions about the out of body experience involve the phenomena of actually traveling to other place with one's disembodied consciousness. This isn't exactly what happens during a big DMT experience, in that no one felt themselves flying over Albuquerque or visiting their relatives' home in Toledo. While there were reports by many volunteers of being "somewhere else," this somewhere else partook more of a parallel level of reality then a slice of everyday reality.
The popular notion of out of body experiences could be tested simply by using information from collaterals who were in the locale that one's individual consciousness seemed to have visited. On the other hand, the objective nature of venturing into and witnessing the contents of parallel levels of reality would require a much more sophisticated validating process. For example, the development of a "dark matter camera," that could capture images of dark matter and then compare those to the reports of DMT volunteers.

JC: You've been quite public about your thoughts on many of the reported "visions" and mystical experiences in religious texts and more specifically the Bible as possibly correlating with endogenous DMT production. You also have a great quote from one of your volunteers in the DMT study stating "You can still be an atheist until 0.4" (referring to one of the highest doses of DMT administered). Do you believe that convergence between religion/spirituality and science will happen within the next 20 years? If so, do you believe that DMT is one of the connecting points between the two sects of belief systems?

Dr. Strassman: Before Descartes and Spinoza, religion and science were quite closely linked in medieval metaphysics. One could describe natural phenomena, explain their mechanisms, and at the same time posit a higher order of abstraction and organization devolving from God and His intermediaries. One of my goals in proposing a theoneurological model of religious experience is to invite people to consider how it lends itself to both a rigorous scientific methodology while at the same time placing the

scientific discipline within a larger moral, ethical, and theological framework. That being said, I think it will be hundreds of years before such a reconciliation can be effectively accomplished, as it's been hundreds of years since the split.

The recent interest in the biology of spiritual experience provides a great fulcrum lending itself to these types of discussions. And, to the extent that DMT mediates between the spiritual and physical worlds, it certainly has a role to play in the discussion of the development of a contemporary metaphysics.

JC: You stated that Jim Fadiman has been conducting studies on the effects of low doses of DMT on people. This would in essence negate the "hallucinogenic" & "out of body" experiences I assume. Are you aware of any of the reported benefits of these types of low dose experiments?

Dr. Strassman: Jim is studying low doses of LSD primarily. You might want to check with Jim to see how his study is progressing. Over tea one day at his home with his wife Anita in Switzerland near the French border, Albert Hofmann shared with us what he say was the laudable effects of low doses of LSD taken on a daily basis; say, 10 µg. He believed this served a valuable "tonic" function— increasing alertness, mental agility, creativity, mood, etc.

JC: Speaking of meditative techniques and DMT, there was a paper published in the Proceedings of National Academy of Sciences in March of 2014 regarding a group of people's abilities to consciously and actively control their Autonomic Nervous System & Innate Immune System. The technique involved in the study was published as "Third Eye" meditation in conjunction with deep breathing practices. Apparently this is the first time in history that the scientific community has measured and documented this innate ability within humans. Based on your body of work and personal experiences, do you

believe that DMT is involved? If so, what would be the potential ramifications for our innate abilities to heal ourselves?

Dr. Strassman: If the meditative practices occasioned experiences similar to those resulting from administering DMT, then one could suggest that endogenous DMT were involved. Even if non-fully psychedelic effects were occasioned from the practices, DMT might be involved, but this would be harder to argue for. Obviously, the clinching piece of data would be to determine that such meditation practices elevated endogenous DMT. Because of the technical difficulties involved in measuring such low quantities of the compound, this is not yet feasible.

However, if people are pretreated with an MAO inhibitor, metabolism of DMT is shunted to a more specific metabolite than what normally occurs. In the non-MAO inhibited condition, DMT is metabolized to a compound (indole acetic acid) that also results from the breakdown of several other endogenous substances. However, at least in people who have taken ayahuasca, which contains DMT and an MAO inhibitor, DMT metabolism shifts to the formation of DMT N-oxide, which can only come from DMT. There is research underway to determine if normal volunteers pretreated with an MAO inhibitor (who have not also taken DMT) do actually produce measurable quantities of this N-oxide. If so, then the N-oxide could be used to measure perturbations in DMT activity in conditions like those described in the paper you are referring to.

JC: What effect do you believe the internet has had on the progression of people's interest and understanding of the spiritual aspect of life?

Dr: Strassman: As in the case of pretty much everything else, the Internet has made more "information" available but it remains as difficult as ever to separate the wheat from the chaff. One example of this may be that many of the theories that I speculate about in my DMT book have been taken as fact, despite my having placed as many

brackets and caveats around those conjectures as possible, distinguishing them from objective data. When only excerpts and impressions resulting from reading the book and introduced into the vast web of the Internet, more careful discernment isn't possible. At the same time, people are being exposed to ideas and objects that they never would have been introduced to otherwise, and if by so doing they pursue a more discerning and sophisticated exploration of those things, good may result.

JC: You like to bring up the refrain by Dr. Freedman, "If So, So What?" in regards to psychedelic drug studies. Most people would like to assume that nature is inherently efficient and is in a constant path towards increasing optimization… "survival of the fittest" if you will. Being that varying levels of DMT are found in literally every living organism on earth whether it be a plant, marine life and/or land dwellers, it is unlikely this is an insignificant finding/fact. While being formally classified as a psychedelic, do you have any particular beliefs as to why every living being has this compound inside of itself?

Dr. Strassman: We know that DMT exists in every mammal investigated and in hundreds of plants. I would not say it has been found in every living organism on earth. Nevertheless, it is amazingly ubiquitous. One of my pet theories is that DMT may function as a type of cross species Esperanto, in that it allows communication between and among any organisms that possess it.

JC: I just recently picked up your latest book "DMT and the Soul of Prophecy" which appears to be an in-depth look as to the evolution of your beliefs. What would you ultimately want to see for humanity in terms of their understanding of this thing we call "life" in the next 10, 20, 100 years?

Dr. Strassman: In some ways, I would like to see a return to a worldview as formulated by the Jewish medieval philosophers. This was a highly sophisticated metaphysics that

provided a seamless melding of sophisticated theology with the science of the day. They had extremely refined understanding of the relationship between God and the universe, including the creation and varieties of life. In particular, they exerted themselves mightily in discussing why things are the way they are, rather than some other way.

After Descartes, and especially Spinoza, “medieval” metaphysics came to a halt. However, this was as much due to these philosophers’ rejection of church authority within the political and economic arena, rather than due to a more specific conflict with the metaphysics of their day. However, they needed to dismantle the authority upon which the clerical establishment stood—which was the revelatory nature of Scripture. And by so doing, they brought an end to any further evolution of the metaphysical models that had been so fruitful in other areas.

The scientific study of spirituality seems the perfect nexus around which to build, or rebuild, an overarching view of existence that takes into account both religious and scientific methods, ethics, and theory. This might be done by revisiting in a sophisticated manner the previously successful system that did so.

JC: I appreciate your time and answers Rick. If there are any closing thoughts or comments for the readers that we have yet to touch upon, please feel free to address them.

Dr: Strassman: I want to emphasize the relevance of the Western religious traditions, especially the foundational Jewish one, for understanding the psychedelic drug effect, in particular the spiritual properties of those states. I believe it is useful to not throw the baby out with the bathwater. That is, even though Western biblical traditions have been the cause of much evil, the original texts and non-hegemony-based commentaries on them can shed light on these topics in a culturally resonant manner, perhaps even a

biologically resonant manner, that is not available using Eastern religious or Latin American shamanic models.

These ideas are encouraging me in 2 directions. One is to bring to light the life of Abraham, the original ethical monotheist. He lived a life directed by prophecy, the prophetic experience, intimate communication and relationship with God and God's angels. At the same time, he lived before the revelation of the normative Jewish law by Moses. Thus, he is an excellent archetype for living a "naturally prophetic" rather than "revealed legal" ethical monotheistic life. This may be an entryway for Western secularly educated anti-Western religion individuals into their own tradition that is based on the prophetic state, rather than the law.

The other direction is something dawning on me as I read the emails that my new book have stimulated in my readers. That is, there does not yet exist an English translation of the Hebrew Bible that is approachable, nondogmatic, nonsectarian, and more or less user-friendly. Perhaps after I have finished reading and rereading all of the extant English translations of the classical commentaries, I might take a stab at this.
End of Interview
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These are exciting times for people who are looking for answers beyond what we find in mainstream scientific and spiritual textbooks. While Dr. Strassman believes that it will be hundreds of years before we can experience a true convergence between science and spirituality, I'm a bit optimistic that we can witness a definitive acceleration taking place within our lifetimes. In my eyes, the work performed by Strassman provides a key piece in identifying an internally produced molecule that has profound effects on not only our spiritual experiences but it can potentially be a key component of the underlying electrical aspect of our bodies. I will be releasing a Q4LT reading list shortly and at the top of it stands Strassman's DMT: The Spirit Molecule as well as Robert Becker's "The Body Electric."There is much work left to be done to cross the chasm of

skepticism and Q4LT will be following up with the additional scientific specialists cited by Rick. I would like to thank Dr. Strassman for taking the time to answer these questions as I believe they are important not only for spiritual seekers but possibly even those dealing with the transition of loved ones from what we consider life on earth to realms beyond our current understandings…

XIV. Q&A with DMT Researcher Dr. Steven Barker

Dr. Steven Barker is the director of Louisiana State University's Equine Medication Surveillance Lab in the School of Veterinary Medicine Building. A full professor since Comparative Biomedical Sciences since 1990, he held the Everett D. Besch Distinguished Professor award between 2000 and 2006. His undergraduate studies took place at the University of Alabama in Birmingham where he received his B.S., M.S., & Ph.D. in Chemistry/Neurochemistry. Dr. Barker's research includes analytical toxicology, the Neurochemistry of hallucinogens, and has been extensively involved in studies involving the endogenously produced hormone dimethyltryptamine (DMT) since 1976.

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Begin Interview

JC: In 2013, you published a paper in the journal, Biomedical Chromatography in which you found dimethyltryptamine (DMT),melatonin as well as precursors and metabolites in the pineal gland of rats. What was your initial reaction to these findings?

Dr. Barker: As of 2013, there had yet to be any examination of pineal glands or their perfusates from any animal species for the presence of DMT. Thus, Dr. Rick Strassman's hypothesis that DMT was released from the pineal gland had yet to be subjected to true scientific inquiry. However, Rick was aware of the work of Dr. Jimo Borjigin (University of Michigan) who had developed a rat pineal gland perfusion or microdialysis method for examining the release of melatonin as well as other compounds from the pineal in free moving, living animals. Jimo agreed to collaborate on a project to examine these perfusates for DMT and provided me with samples. My laboratory applied the most stringent and sensitive analytical criteria to the analysis, using advanced mass spectrometric methodology, in an effort to determine whether DMT was present in the samples or not. From more than a dozen samples, we found five that, according to the criteria, matched all of the parameters to unequivocally identify DMT as being present in pineal gland perfusates from living rats. I have been

doing DMT research since 1976 and, other than data from animals known to be administered DMT, this was my first time to see proof of endogenous DMT in such a biological sample. In fact, it was the first time anyone had seen DMT in such a sample. My reaction to our results? It changed me. The change that occurs in one's psyche from scientific discovery, especially after a long search, or from proving a hypothesis, whether your own or, in this case, Dr. Strassman's, is an indescribable and unique physical and emotional experience.

JC: Can you describe specifically how it changed your outlook both from a physical and emotional perspective?

Dr. Barker: Our hypotheses become our "beliefs" and we work to provide the necessary scientific evidence to prove or disprove them. Having the proof gives them life and allows us to proceed to the next question, the next proof. It's like ascending a great mountain, reaching the top and taking in the never before seen view of both your past and your future. It's a way of knowing that you are on the right path. Happiness, joy, yada yada.

JC: The awareness level of DMT as a "hallucinogen" has grown quite extensively since the documentary "DMT: The Spirit Molecule" was released and is available on Netflix as well as "bootleg" on YouTube. However, it doesn't appear that people are aware that this molecule/hormone is and can be produced in the body naturally. In this video you state that it's likely not a coincidence that all humans have an internal hallucinogen neuronal system. At its core, why do you believe our bodies have been designed as such?

Dr. Barker: Design is a loaded word with unscientific implications. Evolved may be more appropriate!

Probably since the first time our species attained consciousness and awareness we have wondered about the images in our heads, behind our eyes; dream states, reverie, creativity, imagination, the divergent and non-ordinary states of consciousness brought on by extremes of physiological stress and disease or by deep meditation or isolation, the extraordinary states of perception that have led to the mythologies of gods, other worlds and mysticism. We also discovered plant materials that would reliably transport the consumer to these wondrous places and we have since defined the individual compounds that gave these sacraments their power. We have mastered the fields of neurochemistry and neurophysiology to the point where we can create our own such molecules and understand, on a molecular level, how most of them do what they do. This is not the case, however, for the hallucinogens, such as DMT. While we know a number of the brain receptors to which they bind and act and their effect on other neurotransmitters involved, there remain compounds that do the same thing but are not hallucinogenic. Something in our knowledge of their mode of action is missing. There is something remaining to be discovered. In 1981 I hypothesized an endogenous hallucinogen neuronal system based on the presence of DMT in vivo and speculated that this is where and how hallucinogens act. My thinking on this has been refined over the intervening 34 years, but remains basically the same. There must be a compound, a neuronal system, that regulates levels of perception, allowing normal perception to occur and information to be properly processed, but subject to alteration such that extraordinary states of perception and consciousness could also arise. I believe that regulatory compound and system involves DMT. The revision in that thinking is that there must be other peptides, proteins, small molecules, that are also integral to regulating DMT itself. It is a more complex system than simply increasing or decreasing endogenous levels of DMT. What is currently being observed in neuroscience is brain activity/connectivity patterning that helps explain what people experience under the influence of hallucinogens. Thus, activation/deactivation of different brain areas and systems may explain our different subjective experiences, including the extraordinary states of consciousness. This may be DMT’s role. For example, recent data showed

that psilocybin produces a brain activity pattern similar to that seen in REM sleep. Coincidence? Every new answer creates ten new questions.

JC: I read in one of your interviews you were quoted with, “If you’re going to ask questions, you might as well ask the big ones.” I liked that very much and feel very similarly. While I haven’t studied the field of epigenetics in-depth, the concept that our future is not completely defined by our genes and that we can manipulate gene expression through alterations in our external and internal environment seems rather dynamic. My question for you is that when studying DMT and it’s place in the body, have you come across any specific external/internal environment that correlates with increased DMT production and/or experiences?

Dr. Barker: Keep in mind that even epigenetics has a genetic component. Nonetheless, we now know that much of the brain remains “plastic” and neural connections/patterning can be altered by life events and exposures. Changes in neuro-connectivity have recently been demonstrated in ayahuasca users, for example. The research on what endogenous DMT does or what it regulates or is responsible for or responsive to is all very nascent. While hypotheses about its role in various states or involvement in various hallmarks of human life (birth, near-death, death, religious experience, etc.) all seem to make sense, we have yet to produce the necessary scientific data to support any of these ideas. I am hopeful that various government entities, in this and other nations, will begin to allow more research in these areas. I am of the opinion that it will reward us as a people to better understand what these compounds are trying to tell us about our own brains and that such research will give us valid alternative explanations to many outmoded and archaic ideas about ourselves and our universe.

JC: I watched an interview in which you address enzymes found in the lungs that can lead to the synthesis of DMT which could possibly correlate to symptoms associated with schizophrenia. You then presented the potentiality that schizophrenia within itself

could be considered related to lung disease. Was there any specific region of the lung in which these enzymes were found or concentrated? Upper, middle, or lower portions?
Dr. Barker: The only studies conducted on lung tissue were not specific to lung anatomy. My comments were based on an assumption that, if DMT is primarily produced in the lung (where, at that time, the highest enzyme activity had been described) and DMT played any role in schizophrenia, it would, thus, be considered a lung disease. However, I think DMT may primarily be synthesized in the lung during specific physiological states; controlled breathing, such as occurs in many meditative practices, extreme physical exertion, hyperventilation, near-death changes in respiration rates, hypoxia, etc. DMT synthesized in the lung would go directly to the brain, by-passing the metabolic destruction that would occur from liver metabolism. There is some evidence that DMT is neuroprotective and may play a role in neuronal survival in extreme physiological states (either intentional of unintentional) that also alter lung function. Similarly, DMT can have a dissociative quality (OBE) that is also protective in extreme events (trauma, etc.). While DMT produced in the lung may have many other "normal" biochemical functions, it may be one of the hormones that responds to extreme stress (physical and mental) and the role of the lung in such events is well understood.

JC: You stated that DMT could have a dissociative quality (OBE or Out of Body Experience) that has protective qualities. When people report OBE's either induced via specific techniques or via traumatic occurrences, do you believe that their "spirit" is actually viewing it's environment from outside of the body?

Dr. Barker: No. OBEs are dissociative states that occur completely within the confines of one's own skull.

JC: Would this be a scenario of perception that could be proven or disproven in a scientific manner? For instance, if the person claiming the OBE experience in a non-traumatic setting is tested to be able to view specific, secured objects at a distance

in a situation where they would be incapable of doing so when the body is physically located elsewhere in a secured environment/enclosure?
Dr. Barker: This has been done with surgical patients wherein they claimed at death or near-death to dissociate from the body and “float” above the surgical table, observing the events below. Some clever doctors or technicians placed a message that would be easy to see on the light fixtures above the tables, visible only if one were truly floating above. No patient who subsequently reported an OBE as described ever reported the presence of the message or its content. I’m sure there are others.

JC: In this video you describe scenarios in which DMT could possibly be used to explain hallucinatory phenomena. These scenarios include starvation (fasting), isolation, dream states, creativity, & trauma. I believe that this does have correlation with the first Q4LT piece in which we outlined the fact that a combination of fasting, controlled hyperventilation via breathing exercises, slower brain wave states induced by one or a combination of meditation, hypnosis, isolation float tank, combined with stillness of the body have not only been associated with differing states of consciousness but also seem to directly suppress carbon dioxide levels in the blood. I guess I’m going back to the concept of epigenetics and how altering our internal environment can induce alterations in how our body operates on a systemic level. Have you seen any potential correlation for suppressed carbon dioxide levels and elevated/increased “mystical” states as it relates to endogenous DMT release/production?

Dr. Barker: Again, we have no data that correlates endogenous DMT with any physiologic state, normal or altered. My answers above are also responsive to this question. There are a number of “mystical states” that correlate with altering O2/CO2 ratios; the whirling dervishes, runner’s high, hyperventilation (Kundalini breath of fire), regulated meditative breathing, changes in breath patterns with sleep, relaxation, near-death and actual death, etc. The hallucinations that occur from use of isolation tanks or in actual isolation probably arise from a change in up regulation/down

regulation of brain areas and their patterning involved in sensory data processing such that they start to create their own signals; this may be one of the things DMT is normally involved in, maintaining normal brain patterning.

JC: While melatonin production has been well documented to peak during our deepest sleep hours, there has yet to be any specific data that correlates endogenous DMT production with our dream states. Being a scientist you cannot definitely make a statement without the data to support it, however is it safe to say that our dream state comes about due to our own DMT production during deep sleep?

Dr. Barker: Future research should be able to provide a definitive answer in this regard. Since there are no reliable peripheral markers (blood, urine, saliva testing) for demonstrating DMT release by the pineal more research will have to be conducted on pineal perfusates or CSF to determine if DMT synthesis/release is circadian, ultradian or at all associated with sleep patterns. Our 2013 publication only collected pineal perfusates for 2 hours during a light cycle for the rats tested. Continuous perfusion samples over 24 hour time periods will need to be collected. It is not unreasonable to speculate or hypothesize, however, that DMT could be involved in the changes in brain patterning observed in different sleep states; some areas of the brain literally sleep while others are highly active.

JC: While most of the experiences associated with meditation and breathing practices have been largely internalized via “hallucinations” and/or “mystical feelings”, this paper published in the Proceedings of National Academy of Sciences in 2014 showcases voluntary influencing of both the sympathetic nervous system and immune system for the first time in a clinical setting. Based on what you have described in terms of DMT synthesis in the lung, do you believe that DMT could potentially play a role in the showcasing of this innate human ability?

Dr. Barker: I don't think DMT would necessarily have a role in this. Yogis have for centuries demonstrated an ability to control physiological functions through control of innate pathways.

JC: I'm a bit lost right now. Earlier you stated the following… *"I think DMT may primarily be synthesized in the lung during specific physiological states; controlled breathing, such as occurs in many meditative practices, extreme physical exertion, hyperventilation, near-death changes in respiration rates, hypoxia, etc. DMT synthesized in the lung would go directly to the brain, by-passing the metabolic destruction that would occur from liver metabolism."* Being that the PNAS study is largely predicated on the subjects exuding controlled breathing coupled with meditative practices (third eye meditation), it would appear that these subjects are actively participating in practices that would lead to DMT synthesis in the lung that would go directly to the brain. Even if Yogis have demonstrated the ability to control physiological functions for centuries, that doesn't necessarily equate to DMT not being present in the equation does it?

Dr. Barker: DMT may well be in the equation. And it's not that DMT is solely produced in the lung. The enzyme has been found in numerous tissues. My statement is about what may lead to lung synthesis not that that's the only place its synthesized. There could also be release of DMT directly in the brain in response to cytokines released from the lung, other than DMT, in response to changes in respiration rate, O2/CO2 ratios, etc.

JC: While Pinoline is produced in the Pineal Gland from the metabolism of Melatonin, in an earlier exchange you stated the DMT is likely not produced from the metabolism of Melatonin. Based on experience and observation it just seems as though there is a definitive role that Melatonin production coupled with respiratory alkalosis plays in terms of inducing the "mystical experience". I have a wild theory based on absolutely no proof

whatsoever that when the conversion from Melatonin to Pinoline occurs, it allows for DMT to be produced rather simultaneously. Is there any specific relationship between Pinoline and DMT that could potentially provide the missing link on a chemical level?

Dr. Barker: I published a paper demonstrating the presence of 6-methoxy-tetrahydro-beta-carboline (6-MeO-THBC; called pinoline by Jace Callaway) in rat brain and adrenal gland in 1981 (Barker et al., Biochem. Pharmacol., 30, 9-17, 1981 . This compound has been shown to inhibit serotonin reuptake and is a reversible inhibitor of MAO. We have speculated for some time that the MAOI activity of this and related THBC compounds could serve to preserve DMT locally following its release in brain via their MAOI properties. However, there has yet to be any data showing co-release of these compounds from pineal. Nonetheless, in the pineal samples we analyzed with Borjigin in 2013 we did see melatonin and DMT at the same time but, although we looked, there was no evidence for the simultaneous presence of 6-MeO-THBC.

JC: Could it be that Pinoline acts like the catalyst to transition Melatonin to DMT? Something that looks like… Tryptophan to Serotonin to Melatonin to Pinoline to DMT?

Dr. Barker: Melatonin cannot be biochemically converted to DMT but melatonin could influence new DMT synthesis or stored DMT release. The effect would have to be through synergism.

JC: Changing topics for second… there has been much research in the field of "reincarnation" especially at the University of Virginia originating with Dr. Ian Stevenson and being perpetuated by Dr. Jim B. Tucker. Both men have meticulously presented data that leaves very little room for "logical" dismissal. There has also been much anecdotal reports from hypnotherapists and parapsychologist around the world reporting unexplainable "recollections" with patients under deep hypnosis, especially in

somnambulistic patients. What are your thoughts on the concept of reincarnation as a whole?

Dr. Barker: There is no scientific data supporting the concept of reincarnation. The problem is that the question cannot be tested by the scientific method. While some individuals can give vivid recountings of events and cast them as past lives we have no way to actually prove them false or true. This leaves too much room for charlatanism. The idea of reincarnation seems to be borne more of hubris than fact, the idea that we are so very special we must never die or disappear. Given the evidence that our bodies return from whence they came (ashes to ashes) we have conceptualized the disembodied forces of souls and spirits. It has been my experience that for anything like consciousness to exist requires complexity and organization and that such a thing cannot exist disembodied, whether human, mouse, planarium, E. coli or supercomputer. Reincarnation exists only in the sense that our bodies consist of recycled elements and the one known path that can partially reincarnate us; procreation.
It is possible that along with the blueprint to make something as complex as us and many of our other characteristics and instincts, DNA may contain/create memories from our ancestors. Since memories are distinct to certain brain areas and patterns of neuronal firing maybe memories are “inheritable”. Could this be what people are reporting as “previous-life” experiences?

JC: I asked Dr. Strassman this and I will ask you the same question. Edgar Cayce was a reported “seer” in the early 1900s that showcased an ability to put himself in trance and give unexplainable, yet uncannily accurate health diagnoses to those seeking his help. In a few of his documented readings he specifically cites the Leydig (or Lyden) Gland as a potential cause for schizophrenia. From what I have researched, modern science acknowledges the existence of Leydig cells but not so much the Leydig Gland which is apparently located on top of the gonads of both males and females. In all of your studies have you have across this gland? If so, what have been your findings?

Dr. Barker: I am familiar with Edgar Cayce and schizophrenia research. However, I have no knowledge concerning any data that support a role of Leydig cells in any disorder, much less syndromes such as schizophrenia.

JC: Are there any current studies taking place right now or in the future pipeline involving you or amongst colleagues that truly excites you as it pertains to DMT or anything else in particular?

Dr. Barker: We recently participated in a small study to determine if administration of an MAOI would make DMT and its metabolite DMT-N-oxide more readily detectable in urine or detectable in saliva. The results suggest that it does not. This provides further proof, I believe, that endogenous DMT levels are low and highly localized, released only under certain physiological conditions and that a good biomarker for its detection and study in the periphery is, at present, unattainable. This is good to know but further complicates the picture. I think future studies will have to focus on direct measurement, such as we conducted on pineal perfusates, and that those studies will offer the answers we need to what DMT does.

JC: The concept of “God” tends to make many scientists uncomfortable being that it appears as though it would be virtually impossible to prove “God’s” existence or non-existence. What are your thoughts and feelings on the concept of “God”?

Dr. Barker: The concept and practice of creating and then worshiping a god or gods is an antiquated human endeavor. Its foundations were built on an inability to explain our existence and that of the universe (once we came to realize there was one!). The world of the gods has grown ever smaller with the advance of the scientific method and discoveries regarding the function of the human brain. There never was a being, entity, force, etc., that we have defined as a god. There is the unexplained but we should not fall down in awe over the unknown. We have, from the beginning, misinterpreted our

“visions” and emotions in this regard. It is past time for humankind to mature and put aside these fantasies and myths. The concept of god has given us religion which has failed to bring us what they all pretend to preach; peace, understanding, etc. It is not my place nor is it within my capacity to suggest an alternative but we cannot put on blinders when we begin to walk the path to discover its replacement.

End Interview

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The rabbit hole runs deep as it pertains to the mystery that is dimethyltryptamine. Thanks to scientists such as Dr. Steven Barker we are inching closer to bringing our understanding of this internally produced hormone to the next level. The progression of our future comprehension has just as much to do with developing equipment and techniques that will allow us to accurately decipher miniscule particles of what we search for as it has to do with the ambition of the scientists that carry out these experiments. While perspectives of the “super natural” and “mystical” realms will vary based on education, background, and experiences… we do believe that it’s important to digest all information with an open mind and try to apply them to our own mental framework.

XIII. Conclusion

Sometimes individuals can tend to see patterns in things that isn't completely discernible to the rest of the group. Whether the pattern actually exists or not is based on the percentage of the group that agrees with seeing the pattern. Something akin to polymorphism compared to mutation as it pertains to DNA sequencing.

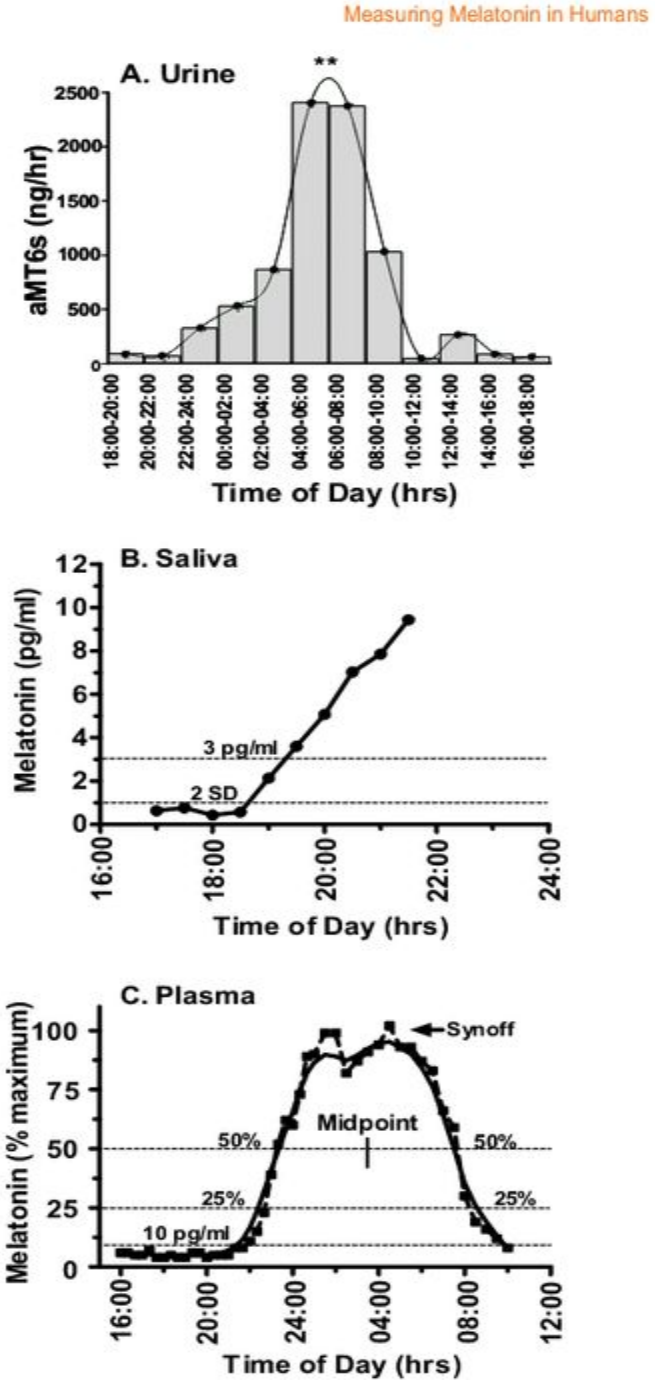
One aspect of life that we cannot deny that occurs in mass format across the entire global population of 7.4 billion people regardless of race, gender, age, or religion is the "dream state" of sleep. Label me as unscientific but I would postulate that 99.99% of the population has experienced a "dream" at least once within their lifetime.

Being that the scientific community has yet to identify an endogenously produced "hallucinogenic" compound *other than* DMT, it would hardly be propestorous to hypothesize that humans synthesize this molecule in elevated amounts during REM sleep which leads to our "visionary" states. The detractors of this hypothesis have yet to come up with a reasonable alternative to this concept. The entire premise of science is basing our speculations based on the best currently available data. While there hasn't been any scientists or volunteers daring and stupid enough to agree to stick a metallic probe directly into a human brain during REM sleep to verify this claim, it doesn't negate the fact that it's considered common knowledge amongst DMT researchers that this compound is created in the lungs.

The fact that mammals of all sorts, especially humans appear to engage in increased respiration rates periodically as they sleep, it would appear that this would play a direct role in "dream" formation. For those of you that refuse to utilize one's own logic in terms of using your senses to observe another person sleeping to see that they are engaged in a form of hyperventilatory action, there is a 2010 study published in the journal Advances in Experimental Medicine and Biology which outlines this phenomena. Here are the details of that study titled "Rapid increase to double breathing rate appears during REM sleep in synchrony with REM - a higher CNS control of breathing?":

"Breathing rate (BR) during rapid eye movement (REM) sleep is known to fluctuate largely, while increases in BR during REM sleep reported were small. In our mice experiments, we found that mice exhibit a rapid increase in instantaneous BR (RIBR) of >2 fold during natural sleep with accompanying atonia, laying their sides down. The RIBR was further found in a sleeping mouse attached with EEG electrodes when the EEG amplitude and delta wave power were lower. Therefore, it is likely that mice show

RIBRs during REM sleep. Interestingly, similar RIBRs accompanied by atonia and REM burst during REM sleep were also found in humans by standard polysomnographic studies in 11 healthy volunteers (age: 22.3 +/- 2.8) with BR measurement by nasal/oral airflow sensors and chest/abdomen belt sensors. All subjects underwent RIBR of doubled BR at least once a night."



It wouldn't appear to be a coincidence that this breath rate coincides with peak melatonin levels (as seen in the charts above) produced within the body that coincide with our dream states.

An interesting experiment that comes to mind is if a person were to take a video recording of their sleep session from (1am to 4am) and document their precise respiratory pattern. This person would then replicate this precise respiration rhythm during their conscious waking state (ideally in similar environments of body stillness/atonia) for prolonged periods of time (1-2 hours) and subsequently document what types of effects were experienced from doing so. This would in essence strip away any esoteric concepts of meditation or systems that a person might be uncomfortable with.

Part of me believes the "Wim Hof Method" is predominantly based on this type of premise as it comprises of extended rhythmic breathing that subsequently induces altered states. (Although there are other interesting techniques that WHM utilizes.)

At it's most simplistic, it would appear that to mimic the conditions of one hour of REM sleep while in a waking state would induce DMT synthesis and the potentiality to tap into latent senses not available at lower levels of DMT and most importantly lesser brain and heart coherence. In order for the general public to begin to comprehend the immensity and potential of states coinciding with elevated endogenous DMT levels, the proper experiments and presentation of those experiments must take place. Simply verifying and documenting that DMT is produced at elevated levels during "supernormal" abilities in blood or cerebrospinal fluid wouldn't be a proper representation of the mechanisms taking place throughout the body. In order for the public to grasp the mechanics of the "miraculous" it would be pertinent to showcase the differences taking place throughout the body on an electrical level, pH fluctuations, 4th phase of water formation, external environmental changes influenced by internal changes, and the many different light spectrum cameras and biometric measurement devices in order to build a comprehensive picture of changes that coincide simultaneously alongside changes in blood/CSF.

I do believe that there are many layers to life and much to be explored. We must remain cognizant that science as it pertains to the human body doesn't create anything. The human body has been in it's current state for thousands of years… we are just beginning to comprehend some of the details of its mechanisms. While it's rather amusing that in this age of technology we tend to look at ancient traditions as outdated and unscientific, it would seem fitting that it looks as though we are beginning to come

back around full circle and thrust ourselves into exploring what the ancient societies seemed to be quite aware of for quite some time…

There's no need to be arrogant, it is time to remain humble and in awe of this crazy experience we deem as "life".

-Questions for the Lion Tamer