

Report

THE TRANSITS OF CONSCIOUSNESS¹

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ABSTRACT

Edgar Wilson, M.D. a physician and founder of the Colorado Association for Psychophysiological Research did research on brain states correlated with states of consciousness for fifteen years. He was especially interested in the transcendent and dissociative states and for 3 years before his death in November 1993, had been considering the effects of brain-based learning technologies on such states. This article is adapted from an address he gave in 1991 and a technical report on a study done with six subjects using a Hemi-Sync process.²

KEYWORDS: Hemi-Sync, consciousness, EEG

INTRODUCTION

This is a personal story—a story of discovery. However, before I describe my recent work, let me share with you the historical context in which we look at consciousness. We look at consciousness through the eyes of electronics, of perspicuity, imagination, wonder and delight, and all of those things that go to make up the neat mysteries that surround the lives we live, if we care to open our eyes to them. This is perhaps a journey into mystery, a journey into our own unfolding, greasing the transits of our knowing.

I started researching consciousness in the late 1970s at the University of Colorado in Boulder with David Joffe, a computer wizard. We were measuring galvanic skin response, and EEG from both the left and right brain with respect to linked ears, when measuring both right and left brain was new and researchers thought the right brain did intuitive work and the left cognitive work and that was that. So we had only two channels and we mostly used T3 and T4 with fast fourier transform, measuring the electrical activity from the right and left hemispheres of the brain. However, the reality that unfolds before you totally depends on the shape and size of the window you are looking through—so our first findings confirmed our suspicions about the world as we constructed it.

Using the computer, we could record and analyze blood pressure and pulse, skin resistance, and brain waves. In this way we could take people through a stress-profiling procedure. After many experiments, I found that stress-profiling didn't work for finding extraordinary or transcendent states of consciousness. It only showed instinctual, habitual responses of survival.

Nevertheless, we did find that we could take our computer readings and convert them into alpha, theta, high alpha, and low alpha, and we tried desperately to tag those labels on to states of consciousness. But this became confusing and troublesome; people would not do what we thought they should be doing. So here we were stuck trying to define all these squiggles on our charts and making little sense of them. Then David moved up to an IBM 386 computer and a math co-processor and we began to look at things up to 60 Hz, then up to 128 Hz—and people were busy up there too! But they shouldn't be—it's not in the literature; something called gamma stops about 40 Hz, we were told, but we were seeing activity in the brain wave spectrum up to 128 Hz, although we didn't know what was going on or why, but I feel certain it was not just artifact.³

We began to look at people in normal, wakeful states and again we found that they were constantly changing. They're not in beta, alpha, theta—they were in all of them and more, and they were shifting constantly. How do you make sense out of this? The more complex the people were, the more tasks you had them doing, and the less defenses they had, the more this shifting occurred. We are apparently capable of processing very many things at once. You're not thinking just one thing as you read this. A part is monitoring your gut gurgling working on your latest meal, a part is monitoring what I'm talking about, a part is making judgments about it, and other parts are doing a host of other things all at once. In fact, after all my years of looking at brain waves, I have yet to find that consciousness even exists in the head. We may just be sending messages, commands, to set up the resonances to get the muscles moving, the digestive juices going, but we really don't live in our brain.

We seem to create a fundamental illusion of time and space by concentrating very narrow-focused alpha activity in the back of the head. The fairly stable spatio-temporal nature of the alpha in many rigid personalities creates the illusion of certainty because it temporarily overwhelms the seeming chaos of multiple stimuli. This allows us to concentrate on learned signals and values. I started to find out about five years ago that sound made a noticeable difference in brain-wave patterns. I could get people to change brain patterns with sounds. We began to see people change states of consciousness, particularly when I used binaural beat frequencies, which I'd heard of from the work of Robert Monroe who had measured changes in the brain with these frequencies since 1957, but there were no references. Then I started giving the individual feedback with the sound of his own brain waves. Now we could get him to track more complex information relative to the interactions of different frequencies in different places. He began to do things with his brain waves that he should not have been able to according to the scientific literature. For example, his temporal lobes would light up in theta when listening to soul-moving music.

Another thing I found at this time was that I, as the researcher, had a profound effect on the actual outcome of the experiment I was running. So I began to work on myself. I began working with holotropic breathwork and hyperventilating to intense music and found that I had feelings, something I'd forgotten for thirty years. When you practice medicine you grow callouses around your

soul, so that you can tolerate the pain of other people. Opening that up was no small issue. When I began to feel again, my own brain waves changed. Now I could light up my temporal lobes. I had greased a transit I'd forgotten I had. The research process began to unfold. To change their states of consciousness, people had to be free to follow their feelings. They had to feel this was legitimate; otherwise, all I recorded was novelty response—more alpha. Now, as I stimulated them with sound that encouraged emotion and feeling, I began to find changes that would occur in the brain as a direct response to the stimulus I was feeding into the brain.

That process led to an understanding about the first indication of transcendent experience. Time/space awareness is the first thing to disappear when one is moving into a transcendent or dissociate state. Dissociative states occur when you lose awareness of time/space. Heightened activity seems to happen right in the middle of the head—the crown chakra if you like—an increase in power occurs at the point of opening oneself to what is, instead of what ought to be in the future or what should have been in the past. It's the moment of "Aha—I exist in this moment—now, and now keeps changing. I can't go back, I can't go forward, I can only exist in this moment." And suddenly a shift starts to happen as time/space is transcended. This correlation between the crown chakra and heightened activity in CZ occurs during healing with the healer, and in other transcendent states in nonhealers as well as healers.

Next I started studying healers, and found that they tended to drive people into this time/space warp when they were working on them, if there was great congruence between the healer and the healee. One day Rod Campbell, a seventy-seven-year-old from New Zealand, came to Boulder. He's an old cowpoke who discovered twenty-five years ago he had something about his hands that could transmit healing energy to others. He could reduce you to tears; he was so sincere; he had nothing to prove and he wasn't trying to make money. He was too simple, and simple people bothered me because I couldn't explain what they were doing. Rod would hold his hands over someone, who would feel warmth, vibration, energy moving, particularly if we put Rod in a more natural environment, such as a cabin in the mountains. There, where it was warm inside and the belief systems were congruent, the tears would start and suddenly something would change.

We had brain-wave measuring sensors on both Rod and the healee, and we would switch back and forth between the two. I also had a magnetometer above Rod's head. He made beautiful spikes of ascending frequency and power as he went into his healing mode. I'd say, "Rod you can heal him now," and he would do it; I'd say, "Rod you can stop," and he would. He said it just came through him. When Rod was working on someone, the subject's distribution and amplitude of dominant alpha would change toward the healer's brain wave pattern, and change back to baseline when he'd finished. Rod was experiencing high frequency and power in his brain activity, and everything else was shut down. Something was happening here, in very high frequencies, with no evidence of change in alpha, beta or theta. My rational mind was really boggled by all this—I kept trying to explain it away.

It seems that suddenly there's a shift from the center of the head out to the temporal areas as you go from the loss of time/space awareness to an awareness of deep empathy, those moments in our lives—only moments for most of us—when we lose the sense of separateness from each other and from our world. Those are the moments when we are able to strip away that last little vestige of fear, to know that we are part and parcel of the same stuff, transcendent stuff. We saw also that this was accompanied by low-frequency occurrences, 1 to 6 Hz, in the center of the head. This seems to keep time/space at bay; it's almost as if we go to sleep to our past and to our expectations. *You get a higher frequency as you move into a transcendent state.* There's a splitting, similar to a state that you might see in a paranoid personality who can't fit into our world, where he's not accepted for his splitting. How ironic it is that we, who are so frozen into our alpha state, trying to be appropriate, to learn everything there is to learn, are willing to come to a place of learning to pay money to learn how to split! In the healer experiments, this splitting occurred at a very profound level. At the time, I checked all Rod's physical functions (eye movement, respiration, heart rate), and none of them was active in affecting the brain waves. Rod was making deep, slow waves, drawing you down into a comfortable state—and then splitting you off where you could play. It was both weird and wonderful!

These phenomena, which would happen only in brief bursts, would occur with a really slow frequency to begin with and track the frequencies of the Monroe tapes in a proportional fashion as far as we could measure. The normal brain

wave frequencies, delta, theta, alpha, beta, are hardly ever more than 20 microvolts power. Rod's frequencies—18 to 32 Hz at 9.7 microvolts; 32 to 64 Hz at 29.9 microvolts; 64 to 128 Hz at 39 microvolts, were totally out of the range we'd ever looked at before. The temporal lobes alone were lit up—there's nothing holding the person down, no theta-delta—it's all in the temporal lobes at high frequency.

When I checked the literature, I found that Penfield had stimulated the right temporal lobe when doing brain surgery. Then the patient would talk about psychic phenomena, relate things that weren't there, such as out-of-body experiences (OBE), and so forth. In fact, the first reference to OBE's with temporal lobe stimulation was by Penfield. Later on, Baer thought that since temporal lobe seizures were often associated with transcendent experiences, OBEs, and other "psychotic type behaviors," this was due to hyperconnectivity between the temporal lobe and the cortex, and he could demonstrate that the temporal lobe would light up in people with temporal lobe seizures.

Persinger showed that people answering a questionnaire that described temporal lobe seizures and disorders often had these esoteric experiences and OBEs. The questionnaire would just as beautifully define those who were having transcendent experiences and OBEs. We are in a world in which "transcendence" and "dissociation" are two descriptive labels for the same phenomenon. *The distinction seems to be, however, that dissociation (as described by Persinger) is a state of low arousal which spreads from the temporal lobes throughout the brain, whereas transcendent experience is a state of high arousal within the temporal lobe area.*

Interestingly, people who channel, who have psychic activity, but cannot remember the content of their channeling or their psychic experience, seem to light up the right temporal lobe only. Those that bring back the content of their experience seem to light up both left and right lobes together.

When I arrived at The Monroe Institute I knew little about it. I was aware only that this was one of the few organizations which had established some kind of laboratory to study consciousness, which was what I'd been trying to do for several years. It was one of the few laboratories actively doing anything in this area of research. Most of the university laboratories had shut down

because nobody could define consciousness or funding sources had dried up. I found that an enormous amount of data had been collected on the effect of various types of sound on the brain, from the computer system, the brain-wave machine, etc. but nobody could make any sense out of this data. I wondered, “What is going on here—what could be going on?”

Now I want to share with you one of the most frenetic months I’ve ever spent, looking at that process from as many ways as I could but failing to see any relationship between the signal they were putting in and what they were getting out. Listeners were obviously having some kind of transcendent experience and were describing very similar experiences, but I could see no evidence of it—only a normal EEG pattern. I decided to give up my expectancies and simply watch and see what happened. This I did, and lo!—some fascinating things began to unfold.

As I observed, I found that putting in a signal was having some kind of an effect on the brain. When we matched up the frequency bands across the head in a global fashion, they would come in bursts until suddenly everything became coherent and the person would start having a state change. The subject would begin producing really low frequencies, like low delta, followed by an escalation of frequency in a certain harmonic pattern. I tried to match this with harmonics like octaves, but it didn’t match. However, the harmonic was a Fibonacci series, a series derived from Pythagoras, who tied reality to a kind of progression of a series of numbers which for him represented something very spiritual.⁴ We see the Fibonacci series reproduced in plants’ branching and in DNA and RNA. We see it as it progresses in the nervous system, the dendrites and neurons branching and unfolding from the deeper structures to the outer structures. The Fibonacci series is all over nature—why couldn’t it be in the brain? Could this sacred geometry of Pythagoras apply to the way the nervous system processed sound?

So we experimented with the Fibonacci series and began to analyze these bursts, low frequencies going into higher and higher frequencies at the crown chakra, and we began to see they followed certain patterns. Waves swept out from low to high frequencies as the individual opened himself to a transcendent state. These waves were somewhat irregular and too complex to analyze. It was apparent from the raw waves that something unique and different was

going on. There was a reciprocal relationship going on here. As the alpha frequencies decreased, there was an increase in both the delta frequencies and very high frequencies. When alpha came back in, the higher frequencies were dampened. *So alpha may act as an inhibition to the shifts into transcendent states.*

We still don't know what generates brain waves—we know so little. We do know there's a kind of pacemaker which makes the alpha; it's located very close to the fourth ventricle where the reticular activating system is located. That pacemaker seems to be associated with memory, which is very much state-dependent according to the frequency our brain is producing at the time we receive the information. So the memory is for externally imposed knowledge, educated knowledge. I find that people who have great wisdom make very little alpha whether or not they are educated. Yet most people who have gone through graduate school make an enormous amount of alpha—they can't stop making alpha, it seems. And the more a person fights making alpha the tighter it gets, the more rational the man becomes.

Alpha seems to be the timer by which we frame our timel-space reality. When we let go of alpha we go into a more immediate awareness of what is in this moment, not what we expect it to be. So this splitting phenomenon is a shift away from this time consciousness into a space-opening consciousness. The split is maintained by holding a very low-frequency/high-amplitude activity in one part of the brain, and then shifting power up into the temporal lobes. I found this true in healing and in psychic and channeling experiments. We have discovered a common pathway. Up to now there's been no stimulus that can be consistently called upon to explain the phenomenon. But now you have a phenomenon that you can predictably and comfortably generate by using a binaural beat stimulus. What I'd been looking at before was generally a happenstance phenomenon that occurred or didn't, depending on the congruence of the belief system of those participating.

What else occurs? Skin temperature changes, but this is not significant in the laboratory because subjects are on a warm water bed and everybody's hand temperature goes up. Pulse rate and galvanic skin response—I couldn't find much specific change there. But skin potential or polarity—what about that?

I'd never measured it previously because I didn't think there was anything there. Then Bob Monroe told me to look at it, and I saw that as the skin potential passed zero voltage, going up or down as the skin potential shifts, more often than not we would observe a low-frequency power surge in the brain, which would trigger one of those escalating eddies or harmonics upward. Is it possible that there's a third measure? That, as the skin polarity shifts, the brain has an opportunity to move into a transcendent state? We know it does when we go to sleep—it could be doing it in this case, too.

We tested the participants in one Monroe Institute Gateway program, before and after the program itself. There was a reduction in alpha density in all except one; after training the trainees made less alpha. Was that because they had less vigilance or was it the effect of the program—or both? There was also far more high-frequency activity, above 30 Hz, in the right temporal lobe. Eighty percent were having temporal lobe activation at the end of the program.

Now we have a measure of *penetrance* here. You can measure how many microvolts you get out of the temporal lobe when you stimulate the different frequencies (using Monroe tapes Focus 10, 12, 15, 21) and you can chart the actual power you are getting out of the temporal lobe as you are delivering these frequencies. After the program you see that the power produced in the higher frequencies by the temporal lobe increases. When someone says “That’s the one I get off on—I’m a Focus 15 person,” you can see that they are producing a lot of power at a high frequency when they are getting the Focus 15 stimulus. *We at last have a means of testing for the penetrance of the frequency following response of the person studied.* The changes after the program show increased temporal lobe power, a higher order of Hemi-Sync signal over baseline levels at Focus 15 and 21; in other words, the person has learned something in the program, and you can demonstrate that learning in the brain waves, not only by what he says is going on.

I tested the power shifting phenomenon against other means of entrainment. I created a tape using the Fibonacci series,⁴ and I could get low-frequency entrainment with it, whereas I got high-frequency entrainment with Hemi-Sync. That is a test for sensitivity to frequency stimulation in the brain.

What does this lead to? I have a theory that this is like Carl Jung's method of looking at the world—about the dimensions of attention. I think what we do with the Hemi-Sync process, and with other processes of healing and psychical activity, and channeling, *is to grease the transits of our knowing*. Some of us stay stuck in our focus; we have a little domain in which we live, and we don't venture out of it because everything is strange and weird outside. Some of us are very narrowly focused, absorbed, living in this domain.

Shifting to open focus may mean opening to a broader expanse of awareness. We know that the dimension of hearing, from low to high frequencies, increases as we go to a broader expanse of knowing. The visual field enlarges as a person gets into greater open focus. Sensory experience of the body also increases with open focus for most of us. Most of us are so used to feeling tension and pain that we have shut our sensing mechanisms off. We do so at great expense because of the enormous amount of pleasurable sensory experience we exclude with that. One of the saddest things is that we shut our feelings down so that we can become more rational.

So what we are doing with the Monroe process may be greasing the transits to states of awareness that we have prohibited for ourselves because they were not natural or normal, or were not legitimated by mentors in life; but they were things we had to discover by ourselves and in ourselves as we continued to grow. When we use this process we begin to heal diseases we have within, because diseases are largely the result of being stuck in our perception as to what is good or bad.

For example, what makes me react with cold hands, pounding heart, and escalating blood pressure is an experience of performance anxiety, a desire to do better, because Mama didn't give me the rewards I had earned unless I came home with all "A's." So, too, everything in life that was good, particularly being loved, became contingent on performance. Those processes of organization of sensory input that precede conscious awareness have been powerfully influenced by my early conditioning, my idea of who I was as a person. That led me to certain forms of stress response in my life. I would respond neuro-muscularly if the world was not a safe place but full of fear, or I would respond vascularly about perfection and performance. Or I'd respond in my brain, as if I were spaced out, behaving weirdly as a response to stress, because grandma always

acted crazily and jumped out of the window if things were bad—so why shouldn't I respond that way? Or I'd respond with my hormones when my feelings were shifted and I couldn't justify it. Women can remember how often they missed periods when under love-stress: In London in the V2 blitz, half the women stopped menstruating.

These states of inappropriate physical responses are physical manifestations of this “stuckness” that we live in, when we are stuck in a way of knowing that is no longer adaptive for us. So what we need to do, whether with Hemi-Sync or some other process, is something we call “greasing transits” between states. We need to teach the ability not only to become passive and relaxed but to become tense, to become angry as well as loving, to learn to honor the dualities of our life and not hold on to any one part of the duality that we find ourselves in. As we mature and get stronger, we need to learn how to honor the dualities instead of clinging to one over the other. We are learning what the ultimate maturation of human beings might be, whether by educational application, transcendent application, spiritual application, or healing. For, healing occurs when we are able to shift freely back and forth between our dualities. Disease occurs when we get stuck in one way of knowing.⁵

When people are really going into ecstatic or transcendent experiences, I've seen them go up to 120 to 150 microvolts activity in the temporal lobe as they start into this process. On the EEG record a beautiful eddy or wave form that flows upward as the individual opens can be seen. I don't think that's just transmuting the alpha. I think it's new energy that's been freed up, or that the individual has allowed to be free. The first time I saw this evidence of temporal activation, I thought the person probably had had a temporal lobe seizure, and I continued to think that for some time because of the intensity of that response.

Remember, when we measure these things we are looking at only about a centimeter deep in cortex; we are not getting any information from the deeper structures. I have a sense that what we are seeing comes from a deep structure, perhaps the corpus collosum. My real sense is that we have used so little of our feeling and our capacity for love and our capacity for great openness, that parts of our brain which connect the temporal lobe with the cortex, the caudate

nucleus, are not very well developed functionally. When we start opening ourselves to deep states of awareness, *with feeling instead of cognition*, we begin to energize these areas, to open a new way of knowing. We have always thought that we can know only through our minds, and now we've come to the terrible knowledge that we don't know through cognition. *We really know only through our feeling*. And when the feeling opens and we really begin to experience that, we want to experience it more and more. We can never have enough. A path opens that we begin to follow; in terms of Jung, the path of our great journey, our search for the great Mother within all of us.

Each of us is dealing with our own heritage. Our stress-response style, our way of perceiving the world, our way of knowing are largely gleaned from parents (or maybe it's something we've brought in with us—I don't know). Perhaps the way we eat is virtually fixed and patterned after about age three, and the language our body uses to express who we are in the world, how we interrelate with our body to express who we are in the world, how we interrelate with other people, and our expectations of life are all built out of our heritage. Our ambitions, and therefore our frustrations, are all born out of our heritage. Perhaps it's time to begin to look at how fluid this process can be, not how rigid, and how much we can learn from this process, not only intellectually but emotionally. How warm the world is if we are warm and how smart the world is if we are smart, and how much we condition the reality that we're dancing in! That's what I really like about this world—it's a place where your reality can dance free.⁶

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REFERENCES AND NOTES

1. The genesis of the concepts presented in this paper were adapted from an address Dr. Wilson gave in 1991. This address was later published in a copyrighted version (including a technical report) in *Using the Whole Brain: Integrating the Right and Left Brain With Hemi-Sync Sound Patterns* (Ronald Russell, Ed., Hampton Roads Publishing Company, Inc., Norfolk, VA, 1993) and is reprinted with the kind permission of the publisher.

2. Note: On the scientific and technical aspects of the Hemi-Sync process, various research papers by F. Holmes Atwater, Administrator of Research, are available from The Monroe Institute, Route 1, Box 175, Faber, VA 22938-9749. They include the following: (1) The Monroe Institutes Hemi-Sync Process: A Theoretical Perspective, (2) EEG Brain Mapping of the Hemi-Sync Process, (3) EEG Alpha Density, (4) Gaining Access to Propitious States of Consciousness with the Hemi-Sync Process.
3. Explanation of terms:

Hz or hertz—number of cycles per second

Microvolt: one-millionth of a volt.

Delta, theta, alpha, beta and gamma refer to brain wave frequencies. A simplified non-technical explanation follows:

Delta: 0 to 4 Hz. Deep meditative states, deep non-dreaming sleep.

Theta: 4 to 8 Hz. Deep relaxation, deep meditative states, and sleep. Related to suggestibility, enhanced learning, healing, and consciousness exploration. Also associated with various dissociative experiences.

Alpha: 8 to 13 Hz. Generally produced with the eyes closed and the mind at rest. It is said to relate to the way the individual processes and interacts with the world he or she perceives.

Beta: 13 to 30 Hz. Conscious awareness, analytic, alert wakefulness. Related to the brain's sensory-motor areas.

Gamma: 30 to 50+ Hz. Related to mystical and transcendent experiences during meditation. May represent a loss of ego boundaries; a sense of merging with other people; a sense of universal knowing.

Note: Much depends on the region of the brain where the particular frequency is recorded and on any associated frequencies. Delta is dominant in early infancy and theta in children between two and five years old, while the others (alpha, beta, gamma) are dominant in adults. Brain wave frequencies also have a pathological significance (gamma is associated with seizures, schizophrenia, and temporal lobe epilepsy, for example).
4. The Fibonacci series is an arithmetical progression derived ultimately from Pythagoras and later applied by the Italian mathematician Leonardo of Pisa, also known as Fibonacci, in the thirteenth century. The series is generated by addition as follows: $0 + 1 = 1$; $1 + 1 = 2$; $1 + 2 = 3$; $2 + 3 = 5$; $3 + 5 = 8$; $5 + 8 = 13$, and so on.
5. *Note: I think that Ed's notion about there being ways of "greasing the transits" or increasing the fluidity of state change is one of his most profound and useful concepts. I believe that all of his research on EEG is a variation on this theme.*
6. A technical report, also published in *Using The Whole Brain* (see reference 1) is included beginning on page 184.

ADDENDUM A TECHNICAL REPORT

An independent psychophysiological study of the Hemi-Sync process was conducted by the Colorado Association for Psychophysiological Research in October, 1991. The purpose of the study was to determine whether the technique could enhance the induction of a transcendent experience. One male and two female adept subjects (experienced users of Hemi-Sync) were studied and compared with one male and two female naive subjects (who had little or no experience of Hemi-Sync prior to the beginning of the study). All subjects were examined while listening to the same series of sounds through stereo headphones, while lying supine in an isolated, shielded environment. The naive subjects were retested after attending the Gateway Voyage training seminar at the Monroe Institute.

All subjects were connected to a twenty-channel, computerized EEG (Neurosearch-24). Data was collected at baseline (without sound), during stimulation with pink noise, and during each of four binaural beat frequency combinations delivered in sequence and embedded in pink noise. Subjective reports of the content of what was experienced were obtained during a debriefing session at the end of each experiment.

DATA ANALYSIS

Raw data was screened for artifacts and all epochs with over 80 μ V spikes, indicating muscle artifacts, in any channel were discarded from analysis. The EEG data was scanned in raw form, and the averaged FFT (Fast Fourier Transform) of 50 epochs was computed at the end of each experiment. Color topograms were derived from each FFT histogram and compared for changes. Specific channels showing the greatest change were subjected to time-series analysis of band widths, ranging from delta frequencies to 64 Hz. "Burst" phenomena—high amplitude spontaneous EEG activity—were analyzed through waterfall display techniques to determine their duration, power, frequency, and harmonic progression.

RESULTS

Significant alterations in EEG frequency and power at the temporal lobes (T3 and T4) in females and at the median of the central cortex (CZ) in males were observed in both the adept and the trained naive subjects. Ascending bursts of frequencies as high as 64 Hz occurred in the temporal lobes in adept females. Males showed smaller

incremental changes at the central cortex median. Adept subjects showed lower theta and alpha power-burst phenomena but higher frequency activity as the stimulus progressed.

Prior to attending the Gateway Voyage, the naive subjects showed similar responses to the first and second binaural beat stimuli (Focus 10 and Focus 12 in the Monroe terminology), but failed to show higher frequency entrainment to the third and fourth binaural beat stimuli (Focus 15 and Focus 21). When the naive subjects were retested after attending the training seminar, their performance levels approached those of the adept subjects.

A flowing, dynamic pattern of EEG activity accompanied the transcendent experiences reported by the subjects. At baseline and during stimulation with pink noise, alpha activity was confined to the cortex behind the Sylvian sulcus (see Figure 1). As the stimulation progressed into the first two sets of binaural beat frequency mixes, this predominant alpha activity decreased somewhat and the subjects' EEGs began to show delta and theta activity at the central cortex (see Figure 2). As the stimulation continued into the third and

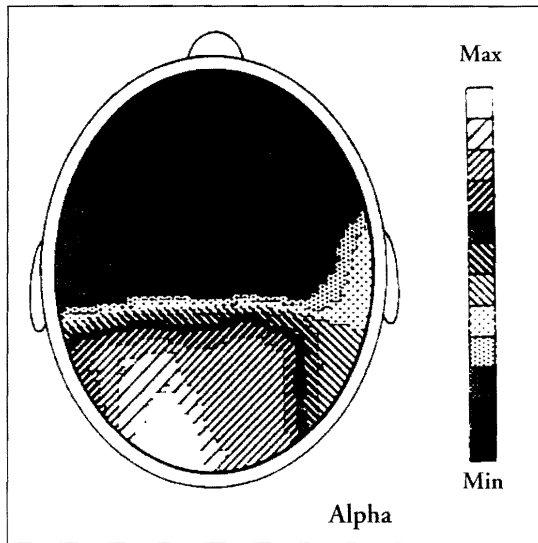


Figure 1. Alpha activity in the baseline phase. The lighter the shading, the greater the activity.

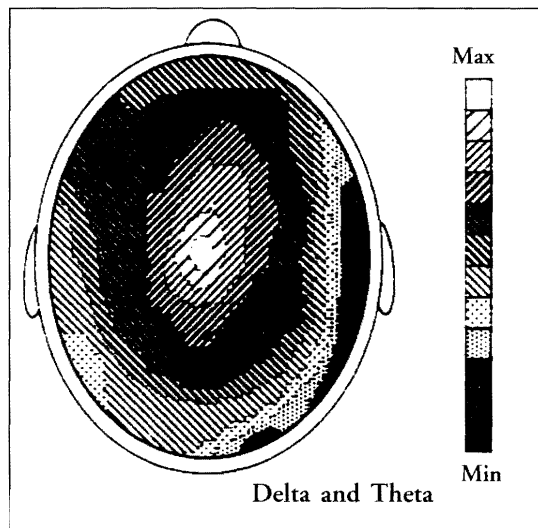


Figure 2. Delta and theta activity during the first two stages of binaural beat stimulation, showing the strongest activity at the central cortex.

fourth sets of binaural beat frequency mixes, marked correspondence between low-frequency bursts within the auditory cortex could be seen to amplify in power at the CZ electrode followed by a progression to higher power and frequency (beta and gamma) activity in both adept and trained naive subjects. Beta and gamma activity in the median central cortex was typical of the males, while beta and gamma activity in the temporal lobes was characteristic of the females (see Figure 3).

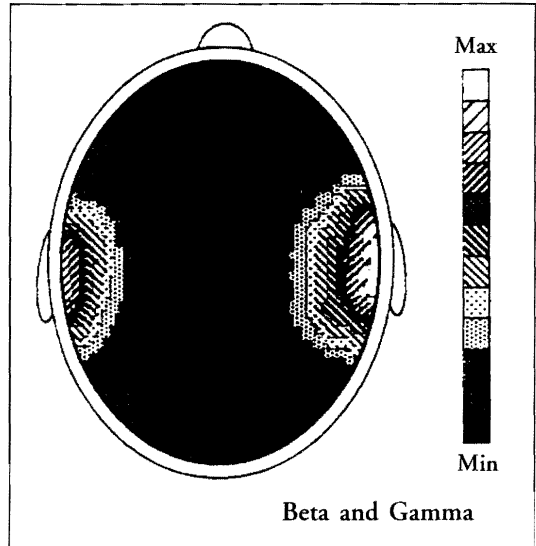


Figure 3. Beta and gamma activity during the third and fourth stages, most marked in the temporal lobes—characteristic of females.

The subjective reports of the remembered content of state changes varied considerably among all subjects studied. No adverse or “bad” experiences were noted. Those showing higher-frequency EEG entrainment above the beta range more often reported “ecstatic” or “out-of-body” experiences. Responders with lower-frequency EEG entrainment above the beta range often experienced sleeplike states with occasional vivid dreams.

CONCLUSIONS

Binaural beat auditory stimulation, as presented in the Monroe Hemi-Sync process, appears to provoke progressive entrainment or penetrance of EEG activity toward higher frequencies and specific patterns of “burst” phenomena. A comparison of naive subjects before and after the Gateway Voyage training program with known adept subjects suggests that a learning curve of progressive higher frequency penetrance may be established. The commonalities of experiential reports during the Hemi-Sync training process may reflect preconditioning of the belief systems of the participants and/or a true progression of transcendent experience.

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