

The following paper was presented by Elmer Green on June 22, 1993 at a symposium in Montreal, Canada. In it, Dr. Green addresses similarities observed between alpha-theta brainwave feedback and vipassana meditation and points to the usefulness of these practices in stimulating intuitive answers from the unconscious that are often valuable in relation to solving problems. [Eds.]

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ALPHA-THETA BRAINWAVE TRAINING: INSTRUMENTAL VIPASSANA?

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Seventy years ago, though details were lacking, most physicians and psychologists knew that localized areas of the cerebral cortex were instrumental in proper functioning of perceptual, motor, and intellectual processes. Then, sixty years ago, it began to be suspected that the sub-cortical brain complex now called the limbic system was associated with specific *emotional* processes, and Papez eventually wrote his ground-breaking paper titled "A Proposed Mechanism of Emotion."¹ MacLean followed with his seminal paper titled "Psychosomatic Disease and the 'Visceral Brain'" and began developing his theory of the triune brain, the cortex (for intelligence), the limbic system (for emotion), and the hypothalamic-brain-stem complex (the reptilian brain, for physiologic functions).²

The articles noted above focussed mainly on neurologic processes, but contemporaneously on the psychological side, through study and use of hypnosis German psychiatrist Johannes Schultz became convinced that both cortical and *subcortical* brain processes could be controlled by visualization. However, since hypnosis-induced visualization often was rejected by patients, Schultz eventually shifted the locus of control from doctor to patient and developed the famed psychophysiologic self-regulation method called Autogenic Training (AT).³ In becoming psychophysiologically skillful through the use of AT, *many patients could produce in themselves the same phenomena found in subjects of hypnosis research.* In fact, though Schultz did not belabor the point, patients given AT learned the rudiments of yoga, and cortical, limbic, and hypothalamic sections of the central nervous system were brought under self control.

This was a momentous development in the understanding of human potential, but in Europe in 1959, even after several decades of exposure to AT, Schultz's therapeutic method was only marginally used by physicians, and in the United States AT was essentially unknown!—Why? The answer: Schultz's clinical findings were dismissed by most physicians and psychologists as *placebo effects*, without any understanding of how ignorant that dismissal revealed them to be, ignorant not only of AT and human potential, but of simple garden-variety hatha yoga. In addition, AT was invented by a clinician! Unfortunately, in the search for good research ideas scientific investigators seldom listen to clinicians. Another problem with AT was that it used no instrumentation. Seeing is believing, it is said, and scientists need something to see, to experiment with, to measure, to manipulate, etc.

In an effort to bring human potential into view as a subject worthy of serious scientific scrutiny, in 1964 at The Menninger Clinic we began researching the psychophysiological correlates of AT, and in 1966 added *biofeedback* instrumentation to reveal to research subjects and patients some of the autonomic changes induced-in their bodies by standard AT visualization exercises. Results were impressive. As soon as migraine patients saw with their own eyes what the vascular system was doing in response to sympathetic activation (cooling hands), and learned to rebalance bloodflow in the body by reducing sympathetic tension (warming hands), they usually could ameliorate, and sometime totally eliminate, migraine attacks. In consequence, general clinical interest was stimulated. Researchers were also intrigued, *instrumentation could be used, objective data recorded, and statistics applied.*

Since 1969 (when the Biofeedback Research Society was formed, now known as the Association for Applied Psychophysiology and Biofeedback) and the present time, cutting-edge interest has moved from preoccupation with the striate and autonomic nervous systems, to the central nervous system, and in particular to alpha-theta brainwave feedback.⁴⁻⁸ And now it has been found that the self-induced reverie state of alpha-theta feedback makes it possible for patients to get control of and eliminate lower-brain disorders such as alcoholism, combat-related post-traumatic stress syndrome, and possibly *Bulimia Nervosa*.⁹⁻¹⁷ Although the above medical topics and applications of alpha-theta brainwave training are intensely interesting, the focus of the present report is *not* on theta training's psychophysiological effects, but on its psychologic and *transpersonal* aspects, and for this a bit of personal history is appropriate.

In 1938, while enrolled at the University of Minnesota in the Institute of Physics, I learned a particular meditation technique from a teacher, Will J. Erwood, whom I now think of as an Irish yogi. The essence of his instruction was to quiet the body, the emotions, the mind, and move consciously into an alert impersonal (transpersonal) detached state in which the functions, activities, and contents of mind, emotions, and body (the triune personality) could be “witnessed,” objectively, for “self knowing,” as Erwood put it. This procedure is closely allied to what is taught nowadays in the West as Buddhist vipassana meditation, alert detached mindfulness.

Later, in 1946, as a graduate student in the Department of Physics, UCLA, I found that seemingly insoluble mathematical problems (insoluble to me at least) could be unraveled by moving consciously into the “witness” state and asking for help from my Self (which in Zen is called the True Self, and in Tibetan Buddhism is called the Lotus Self, and in mystic Christianity is called the Christ Self). To facilitate intellectual understanding, I requested that answers appear as hypnagogically-generated images and symbols, projected from normally-unconscious sources onto my consciously-blanked non-daydreaming mental screen. It worked! Needless to say, I was a better student at UCLA than at the University of Minnesota.

Still later, 1962, as a graduate student in Biopsychology at the University of Chicago, by making use of this technique for interrogating the unconscious I solved the 100-year-old mathematical dispute in perceptual psychophysics between the Fechnerian “discriminability law” and the Stevens “power law.”¹⁸ That especially impressed me, for I found that I had intuitive resources for solving *previously unsolved* problems! The Self seemed to know, and understand, many mathematical and perceptual details, and relationships, of which no one previously had been aware!

The major fact, though, that I wish to focus attention on here, is not that I had useful personal experience based on a meditation skill, but that *my colleagues and I (Alyce Green and Dale Walters) eventually succeeded in instrumenting and generalizing the meditative method through alpha-theta brainwave feedback training*. And, we subsequently made it available to everyone, meditator or non-meditator. To do this, we developed a three-tone EEG feedback instrument, now manufactured by Discovery Engineering International (DEI), in

which different tones give the trainee *simultaneous* information on the presence of beta, alpha, and theta EEG rhythms in a single electrode placement.¹⁹

This instrumental development sprang from the fact that when I moved from the University of Chicago to The Menninger Clinic in 1964 and set up Psychophysiology Laboratory, I wired myself to an EEG polygraph and found that, in me, the state of detached transpersonal awareness was always accompanied by a transition from beta rhythm in my left-occipital cortex (the visual cortex at the back of the head) to theta rhythm mixed with alpha. The upshot of this EEG finding, first found in myself and later found in psychiatrist Stanislav Grof and other creative people, was the writing, and obtaining, of a 1971 NIMH research grant titled “Alpha-Theta Brain Wave Feedback, Reverie, and Imagery.”⁸

This alpha-theta development, now presented at The Menninger Clinic in monthly hands-on workshops for professionals, eventually led to the present-day surge in alpha-theta training for control of addiction syndromes. In particular, clinical interest in alpha-theta training was accelerated in 1990 by the research reports of Eugene Peniston on alcoholism recovery in Veterans Administration patients. Interestingly, *Peniston obtained his successful protocol from hypnagogic imagery generated during one of our Menninger brainwave workshops*. Specifically, during a theta brainwave session he “interrogated the unconscious,” asking for information on how to work with alcoholics, and was rewarded with his breakthrough idea.

Though medical applications are fascinating, for some students a more interesting correlate of alpha-theta training is the relatively rapid development of a skill in shifting, without years of trial-and-error meditation, into a state of consciousness in which one comes face-to-face with one’s Self. This transcendent Being, who is above, below, behind, within, or hidden by, the Freudian ego (depending on one’s preference in terms), is symbolized by the Lotus blossom at the causal-intuitional level of Figure 3.1 (see page 140). For a detailed discussion of the levels-of-consciousness diagram of Figure 1, the reader may find it useful to peruse previous descriptions.^{8,20} Suffice it to say, the diagram is based on concepts from classic Tibetan Buddhism and Indian metaphysics.²¹⁻²⁴

This diagram was originally constructed in 1963 for a course at the University of Chicago in which I found it useful to outline the major similarities and differences in the psychologies of Sigmund Freud and Carl Jung. Though that topic is not outlined here, it is noteworthy that Freud said that psychoanalysis was concerned with “the basement of the human psyche.” That includes everything in the “personal” region of Figure 1, namely, everything below the causal level. Jung, on the other hand, was concerned with the entire seven-level structure. In that regard, his Psychological Commentary written for Evans-Wentz’s edition of *The Tibetan Book of the Dead* is especially significant.²²

It is interesting to note that a major concept of ancient metaphysical thinkers was that all matter is condensed energy, and that every piece of the cosmos (including the body, mind, and spirit of each human) exists in relationship to all else. In fact, the metaphysical concepts of energy-and-relationship in Tibetan Buddhism are remarkably similar to the energy-and-field-theory of modern physics. In both systems it is hypothesized that one primary form of energy exists, from which everything else is constructed.

In Tibetan Buddhism, though, it is postulated that elaboration of the one basic energy includes not just physical substance but also includes emotional substance, mental substance, and other more rarefied materials, and, in the human being, it is said, all these *substances* are brought together. Aurobindo summed it succinctly when he said that if you are embarrassed by the word *spirit*, it is useful to think of spirit as the most rarefied form of matter. But, if you are not embarrassed by the word, you can think of *matter* as the densest form of spirit.

Returning to alpha-theta brainwave training, in Menninger workshops the trainee is wired with *one active electrode* (of a three-tone DEI feedback instrument) placed on the left occiput at the back of the head. The neutral-reference electrode is attached to the right ear lobe. Though 24-channel multi-electrode brainwave machines are available in our lab, and used for research and for analysis of unusual EEG problems, we have found that 90% or more of what we wish to accomplish in alpha-theta training can be done with one active electrode plugged into the DEI feedback instrument. Putting the electrode over the left visual cortex is particularly important, for when that area “goes

into theta,” visual imagery generally shuts down for most people and the mental screen goes blank, ready to receive projections of hypnagogic imagery (approaching-sleep imagery, springing suddenly into view, originating from normally-unconscious sections of the psyche).

The trainee, left alone with the feedback machine, silently practices heaviness, warmth, and mind-quieting autogenic phrases, inducing striate and autonomic relaxation and stilling the mind. In consequence, the tones of the EEG feedback instrument signal a reduction and elimination of beta, an increase of alpha, and finally the production of a few bursts of theta rhythm. What is essential here is that the body, emotions, and mind become quiet. If anything twitches, if muscles, emotions, or thoughts are allowed to activate, the theta tone goes away.

After a few sessions, most trainees are able to get into the theta state for several minutes, and when in that state carry out their original plan, either interrogating the unconscious for the solution of problems, or planting visualizations for the control of lower brain centers (as in addiction control), or take the opportunity to explore “higher” states of consciousness, turning attention toward the crown of the head. This upward focus of detached attention (without moving the eyes, of course) brings the trainee to the causal level of Figure 3.1. Specifically, the conscious ego’s focus of attention comes to the base of the Lotus.

Interestingly, some trainees, after reaching the state of deep personality quietness, and focussing their attention upward, have a full-blown “tunnel experience,” and meet the Light. Their experiences are often very similar to the reported Near Death Experience, though obviously they did not need a near-death physiological crisis in order to get the body, emotions, and mind to shut down.

Without elaborating, I can say that in the last five years clinical, research, and exploratory results of alpha-theta brainwave training have exceeded our most hopeful expectations. Visualization coupled with brainwave training has led to deep physiologic change, emotional tranquilization, and a degree of mental control seldom reached in meditation and yoga without long practice. In my estimation, this is because the True Self of us, the creator of our destiny, can

be quickly approached if the personality is made silent through theta EEG feedback and at the same time we focus detached attention “upward.” The Self is always willing to help “us,” it seems, if we approach it in the right way and make ourselves open to it.

In spite of the Self’s wisdom, however, the personality sometimes rebels, and will not accept what is suggested. An example of this is described in the paper called “Biofeedback and States of Consciousness.”⁷ In brief summary, Marty, who was skilled in alpha-theta contact with the unconscious, asked me to help him decipher answers he had received in an alpha-theta feedback session. He had reached the “tunnel” and had asked for help. the Being of Light made itself known and gave him specific instructions, telling him that in order to save others he first had to save himself, or risk being torn in two.

Since Marty had Crohn’s Disease, in which the lower gastrointestinal tract often becomes shredded, this had specific meaning. Unfortunately, Marty also had a self-imposed and unresolved burden of guilt, stemming from experiences beyond his control in the military, and he shouted to the Light that he refused to come through the tunnel unless he could also bring persons *to whom he was personally attached*. At that ultimatum from Marty the Light vanished, the tunnel closed with a bang, and he was left in darkness.

When Marty discussed these events with me, he refused to consider any of the many physical and psychological options open to him, except the one he had shouted to the Light. Two months later he was dead of Crohn’s Disease. *Sad as it was, Marty at least knew what he was doing*. He was conscious. He made choices. That is more than the average person can do. Also, if reincarnation is a fact of life, Marty undoubtedly had a crucial, conscious, invaluable learning experience.

On a more cheerful note, when our Menninger research team (which included Alyce Green and Judith Green as co-investigators) went to India in 1973 to investigate the psychophysiological skills of yogis, we met a scholar (Rama Sharma, Ph.D. Head of the Department of Biophysics, Post-Graduate Institute of Medical Education and Research, Chandigarh) who, without instruction, could produce theta at will.⁸ I had taken one of the three-tone machines to India for demonstration purposes, and after listening to my lecture on EEG

feedback for enhancement of creativity, Sharma said he wished to be wired up and “tested.” Much to my surprise, from the first instant he could turn occipital theta rhythm on and off like a light bulb, when requested to do so. Astonished, for no one we had ever seen, or trained, had developed such a phenomenal skill, I asked how he knew what the theta state was, especially because he had never heard of “theta consciousness” before we arrived.

In reply, he said that in my lecture the subliminal hypnagogic state of consciousness had been described sufficiently for him to identify the theta state in himself. When I asked how he had learned to shift consciousness into this state, he said that as a youngster he had a guru who taught him to meditate, to go inward to the “place of silence” where the Spirit was and where questions could be answered. Sharma added that later, in graduate school, when he needed to generate a Ph.D. research proposal, he went into that state of consciousness to get ideas. And, whenever he was stuck in his subsequent research as a professor, he shifted consciousness to that state and asked for answers, and they were never wrong. His experiences and mine, over the course of our lives, had close parallels, and it was greatly reinforcing for our theory of self mastery to have witnessed his skill at theta control and get his experiential report.

In conclusion, those of us at Menninger who have had experience with the theta state of consciousness, both personally and as teachers, have come to feel that it tends to lead one toward an ultimate goal of total “self mastery.” If one wishes to get answers, the answers are there. If one wishes to reprogram the body, or emotions, or mind, visualization while in the theta state tends to be converted into reality. And, if one wishes to meet one’s Self, and discover options for his or her life, the Self will help. Appropriately, as was once said, “Ask, and ye shall receive.”

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19. R. Hartzell, 1993, is President of Discovery Engineering International (DEI). He was the Menninger biomedical engineer who in 1971 converted my functional specifications for simultaneous 3-band EEG feedback into hardware. At present he makes and sells these EEG instruments (to Menninger and others) from DEI, 3115 Westwood Drive, Topeka, KS 66614.

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