

*Selections below are from the Greens' Biofeedback and States of Consciousness which appeared in **Handbook of States of Consciousness**.<sup>1</sup> In this paper we see five major states of consciousness are described and illustrated. The Greens relate the role of "biofeedback" to each state of consciousness. By "biofeedback," unless otherwise stated, they always mean self-regulation, voluntary control, the human capacity to exercise volition, awareness, intention, will; the potential to grow and transform. [Eds.]*

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## BIOFEEDBACK AND STATES OF CONSCIOUSNESS<sup>1</sup>

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*In almost no other area is one's intellectual understanding so dependent on an adequate experiential base as in the consciousness disciplines. Both history and modern psychology are replete with countless examples of misunderstandings, dismissals, and pathological interpretations of these disciplines by those without personal experience and training in them.<sup>2</sup>*

### PROLOGUE

**B**efore discussing biofeedback and consciousness it is useful to define biofeedback, and biofeedback training, in the way they are used in this chapter. *Biofeedback* is the feedback of biological information to a person. It is the continuous monitoring, amplifying, and displaying to a person (usually by a needle on a meter, or by a light or a tone) of an ongoing internal physiological process, such as muscle tension, temperature, heart behavior, or brain rhythm. Biofeedback is not conditioning, and it is not therapy, any more than the act of looking at one's weight on a bathroom scale is conditioning or therapy.

*Biofeedback training* is the use by a person of his or her own physiological information in learning to voluntarily control the process being monitored. If anyone insists, the procedure might be called instrumental self-conditioning, although linking "self" with "conditioning" may seem paradoxical. A number of biofeedback training programs, both research and clinical, have led to what some investigators call "altered states of consciousness."

It seems more accurate, however, in the context of biofeedback training, to speak of “states of consciousness” and delete “altered.” “Optional states of consciousness” is better in the context of volitional procedures that are open to all (*i.e.*, all who pay the price of practice), but “altered” is misleading.

The word “altered” may be appropriate when externally administered psychoactive chemicals or procedures actively invade or modify the central nervous system (CNS), but it seems inappropriate for *self*-regulation, in which self-consciousness and volition are essential, whether arrived at through autogenic training, meditation, yoga, or biofeedback training. It is especially inappropriate in an educational setting.<sup>3</sup> Needleman makes this same point about “altered,” in another context (in the “search for a lost religion”), when he says:

. . . the LOST element has to do with a quality of consciousness which is not a so-called “altered state of consciousness” but a quality of presence which appears when one is brought in front of the contradictions of one’s own life and mind. I’m convinced there is a discipline, a way of cultivating this state of presence.<sup>4</sup>

In our view, psychophysiological training, using biofeedback as an aid, is one of the most effective of the newly developing ways of cultivating this state of presence, or at least finding the “inner place” (in the brain?—in the “heart”?) that opens to this state of presence.

## BACKGROUND

**I**n the early days of the Biofeedback Society of America, founded in 1969 under the name Biofeedback Research Society, it was affirmed by many members that: (1) biofeedback research and clinical biofeedback training were forms of instrumental conditioning; (2) consciousness of procedures and intermediate goals by the trainee was not a necessary ingredient of biofeedback-aided behavior modification; (3) *only* the trainer need consciously: (a) determine the training procedure and contingencies, (b) keep track of ongoing results, and (c) make midcourse corrections of procedures and contingencies.

Trainees were not treated as colleagues whose comments and suggestions might prove useful, or even necessary, to the solution or amelioration of the presenting problem.

Looking back, it is not difficult to understand the underlying reasons for the above orientation. Most members of the Biofeedback Research Society were psychologists or psychophysicists whose training and professional careers had previously focused on animal behavior, and on the descriptive theories of B. F. Skinner and his ideological descendants. The idea that “states of consciousness” might be involved in instrumental conditioning was not thought about.

**I**t is now clear to most therapists, however, that clinical biofeedback training, if it is to be effective, involves first and foremost the consciousness and volition of the patient, and secondarily the consciousness and volition of the trainer. Restated in terms of recent metaphors (and some facts), it was thought by many early researchers that the left cortex of the trainer was essential to success in training patients, and neither left nor right cortex of the patient need be consciously involved (any more than in deep-trance hypnosis). The limbic brain of the patient must be properly instructed or manipulated, of course, in order to affect physiological processes through limbic-hypothalamic/pituitary neural tracts, but the patient’s cortical apparatus really was not needed.

That logic, stemming from animal conditioning, has been remarkably barren, though, in explaining the majority of psychophysiological phenomena associated with biofeedback training in humans, mainly because biofeedback training in humans is *self-regulation training*, and successful self-regulation involves both increased “body awareness” (which develops through feedback of physiologic information) and increased skill in the use of visualization and passive volition to control the process being monitored. These three ingredients of psychophysiological self-regulation, *self-awareness*, *passive volition*, and *visualization*, clearly involve “states of consciousness.” Each of these factors is necessary, but not individually sufficient, for success with biofeedback training.

Misunderstanding can develop here, for on occasion research subjects report, while undergoing training, that they cannot detect in themselves any internal physiological awareness associated with the newfound control (such as control of single motor units, single nerve fibers). Some researchers have concluded, therefore, that physiological awareness in the patient or research subject is not necessary. We must remember, however, that in every biofeedback situation involving *self-regulation* information is first fed back to the cortex via biofeedback devices. Later, when self-regulation develops to the point at which

biofeedback devices are no longer necessary for continuation of the skill, a sensitivity to interoceptors (internal feedback circuits) has taken over, has replaced the original biofeedback source of information. The machine's information has been replaced by direct body awareness.

The fact that subjects or patients sometimes cannot easily describe this awareness is not to be wondered at, for interoceptors feed back their signals to subcortical brain centers, in which awareness only slowly develops (as affirmed by yogis and others who have become adepts at physiological self-regulation). Even the best of us cannot say exactly what the difference is between the odor of carnations and roses. The reason is that the olfactory organ is connected first with the limbic system, and secondarily with the cortex. Nevertheless, we are not in doubt about the differences, even though we may be tongue-tied in trying to describe them.

**W**e are not saying that unconscious instrumental conditioning is not possible. That unconscious involuntary conditioning is possible, is already an established fact. What we are saying is that self-regulation requires a source of conscious information, either cortical or subcortical. When Basmajian trained a number of research subjects to control the firing of a single motor nerve fiber, they could not do it without continuous auditory feedback (apparently because a level of internal awareness was not sufficiently developed).<sup>5</sup> On the other hand, when we trained a few subjects to control the firing of a single motor nerve fiber, *one* of them reported and demonstrated a body awareness (in his forearm, on the surface of which our electrodes were attached) by means of which he could at will turn on and off the firing of the fiber, without external feedback.<sup>6</sup>

We apologize for not mentioning many important contributions to the field of "biofeedback and consciousness." Instead, we are focusing in a more general way, using selected references, outlining and describing five major kinds of consciousness that we have found to be associated with biofeedback training. It will be noted that these broad divisions of states of consciousness are characteristic not only of biofeedback training, but of all human experiential, existential phenomena:

1. Physical
2. Emotional
3. Mental
4. Extrapersonal
5. Transpersonal

It is said by some linguists that Sanskrit has more than sixty-five definitions and descriptions of aspects, attributes, and gradations of consciousness; but Westerners who have studied Sanskrit know that it is difficult to use these differentiations. At our present stage of research in consciousness in the Western scientific world, these definitions are too fine-grained. And neither have the differentiations in states of consciousness of Aurobindo and Tibetan Buddhism been easy to use.<sup>7,8</sup> Therefore, in trying to classify subjective experiences in research subjects (college students taking part in a theta brain wave and imagery study), we found it advantageous to use broad relatively easy-to-understand experiential categories, and began using a purely descriptive word, “extrapersonal,” for certain experiences and the associated states of consciousness.<sup>9</sup>

**M**uch of the following is focused on physical states of consciousness and their relation to other states. The reason is that in the West the contribution of body awareness to physical health, and of physical health to mental and spiritual health, has been largely ignored, except in popularized Eastern imports such as Tai Chi, some kinds of yoga, and the martial arts (including Aikido). For Western trends in body/mind/spirit medicine see Pelletier and Shealy & Freese.<sup>10,11</sup>

Transformation of the body and of the psyche generally seem to progress at the same time, but in many of our research subjects and patients, awareness of change in body functions or in physiologic processes has preceded awareness of psychological change. In others, awareness of psychological came first. In either case, the so-called body transformation has been associated on occasion in our subjects with extrapersonal and transpersonal phenomena.

## DEFINITIONS

Since 1975, psychophysiology therapists, using biofeedback training as a major therapeutic modality, have become increasingly aware of the various domains of experience listed above, each involving a state of consciousness that can be differentiated from others through training and experience.

The first three categories, physical, emotional, and mental, are familiar to everyone, and even the concept of transpersonal experience has become quite well known since Sutich, Maslow, Assagioli, and others first wrote on the subject.<sup>12-15</sup>

But the concept of extrapersonal experience, its similarities and its differences from transpersonal, has only recently become a subject of discussion-and under different names, such as psychic, astral, and magical.<sup>9,16-18</sup>

The main similarity between extrapersonal and transpersonal experience is that both seem to originate from sources beyond the ego and personal unconscious of an individual. The difference between extrapersonal and transpersonal experience seems to be most apparent in considering the difference between psychic (or perhaps, parapsychological) and spiritual. An experience may be both psychic and spiritual, or exclusively psychic, or exclusively spiritual; but the difference between them, when it exists, is often neither negligible nor inconsequential. Using such differentiations, Jung's "collective unconscious" clearly contains both the extrapersonal and the transpersonal, as does Grof's analysis and description of realms of the unconscious.<sup>19-21</sup>

**P**syche, following Aurobindo's differentiations, was usually spoken of as "cosmic," and meant any nondivine (nonspiritual) experience arising from physical, emotional, and mental sources lying outside one's own personal ego and personal unconscious.<sup>7,22,23</sup> Divine (spiritual) to Aurobindo was "universal," transcendental, transc cosmic. Spiritual experience, following his definition, had its source in "overmind" and "supermind," dimensions of energy/substance and experience similar to "dimensions of the Void" in Tibetan Buddhism.<sup>8</sup>

To Aurobindo, if an experience was purely cosmic, it had no universal content. It related only to physical, or emotional, or mental states, or to a mixture of them. On the other hand, if an experience was purely universal, it was ineffable, could not be described in words, was of the nature of the Void-not meaning nothing but meaning no words are adequate. If an experience was *both* cosmic and universal, it had a combination of physical, emotional, mental, and universal components, and thus could be described in words, though often only in symbolic language.

Extrapersonal, as a category corresponding to Aurobindo's idea of "cosmic," includes the field of research studied scientifically in most parapsychological laboratories. In brief, *extrapersonal* experience means beyond the normal limits of the ego and the personal unconscious, into cosmic nondivine awareness; *transpersonal* experience means beyond the normal limits of the ego and the

personal unconscious, into universal, divine awareness. Concerning “nondivine” (cosmic) and “divine” (universal), the difference between extrapersonal and transpersonal is similar to the difference between Halloween and Easter.

It is noteworthy that a specific experience may have consciousness components in several categories. A remarkable example of such an experience is described by James Lester in his article “Wrestling with the Self on Mount Everest.”<sup>24</sup> Four climbers, lost in the dark at 28,000 feet, stayed on a ridge overnight without oxygen, tent, or sleeping bags. Some months later, one of them wrote about his experience on that lonely ridge:

I could see my body lying on that rock and snow. . . . I cared not if I came back . . . I felt I could peek into the other side of life and understand death . . . I reached a void where everything became one. . . . There was no space, no time, no sense of losing life. . . . The trivia of life disappeared beyond the broad, powerful outlines of existence and truth . . . I was one with the universe . . . I knew who I was and what I was.

## MIND, BODY AND MACHINES

**I**t may at first seem odd that the above definitions and differentiations between extrapersonal and transpersonal are useful in a discussion of biofeedback training. “After all,” it might be said, “biofeedback means machines. And machines cannot produce either psychic or spiritual events. Correct?” Yes. But a misunderstanding often hinges on the idea that biofeedback machines produce something, or do something to people. They do not. They only detect, and display to a person’s cortex, information about normally hidden processes of the body. But since the body reflects the brain, and the brain reflects the mind, and the two (brain and mind) are not separate while we have a body (even in out-of-body experiences), it can be inferred that becoming aware of the body means becoming aware of the mind.

This logic, this argument, is useful and sometimes adequate for satisfying, or pacifying, the left cortex, but it is not always needed. From an arational, pragmatic experiential point of view, we are again and again told by yogis (and by research subjects and patients trained in psychophysiological self-regulation), that becoming aware of normally *involuntary* physiological processes is linked

with becoming aware of normally *unconscious* psychological processes. This experiential fact is beginning to have significant applications in psychiatry.<sup>25-28</sup>

Regarding the mind-body linkage, it is worth noting that there is no such thing as training the body. There is only the training of the CNS. And in our view, consciousness is the most essential factor in developing self-regulation skills in the CNS, regardless of which neural and biochemical- mechanisms of the body reflect these skills. As conscious autonomic skills become habitual, they can be allowed to sink from consciousness; but, of course, as with a striate skill, they can be “called up” for examination and modification at any time.

If the brain lost its body (and thereby lost all its exteroceptive and interoceptive sensory inputs), and was floated in a tank of cerebrospinal fluid, presumably it would not be able to detect the loss if the appropriate neural signals reached it through “wired” connections from outside, and appropriate perfusing liquids and biochemicals were provided through carotid arteries. This basic idea was delineated (in different words) over 170 years ago by Charles Bell. Helmholtz and Fechner, upon whose ideas much of modern experimental psychology has been based, took it for granted.<sup>29</sup>

**A**gain, the point is that the training of the body with biofeedback machines really is the training of the CNS. And that means the training of the mind. We are not aware of our CNS; we are aware only of our states and contents of consciousness. Therefore, the conscious and willful training of what we call the involuntary nervous system involves becoming conscious of, and training, the so-called unconscious. Without this extension of consciousness over previously unconscious functions, *voluntary* control of the autonomic neuro-system is not possible. If this is not apparent, think of the fact that self-regulation, by definition, means *conscious* self-regulation. If it is not conscious, it is not self-regulation.

This psychophysiological reciprocity, in which the brain affects the mind and the mind affects the brain, may be a hard point for those who choose to view the mind as separate from the brain, or for those at the opposite end of the philosophical spectrum, who choose to maintain that mind is only epiphenomenal awareness of fully autonomous processes of the CNS. But experiential data imply that the body and mind are inseparable (at least for the period of time in which we have a body), regardless of what body and mind each may



be in ultimate fact. And this leads to another philosophical knot: the *volition* problem.

**I**f the body affects the mind and the mind affects the body, how can anything happen except by reaction? Only by postulating the existence of volition can the logical bind be converted to a case of psychophysiologic constraints, rather than adamant. The psychophysiological-principle-plus-volition to which it seems useful to subscribe if we wish to escape mental and physical paralysis is: "Every change in the physiological state is accompanied by an appropriate change in the mental-emotional state, conscious or unconscious; and conversely, every change in the mental-emotional state, conscious or unconscious, is accompanied by an appropriate change in the physiological state. When coupled with volition, this principle allows a process called 'psychophysiologic-self regulation' to occur."<sup>30,31</sup>

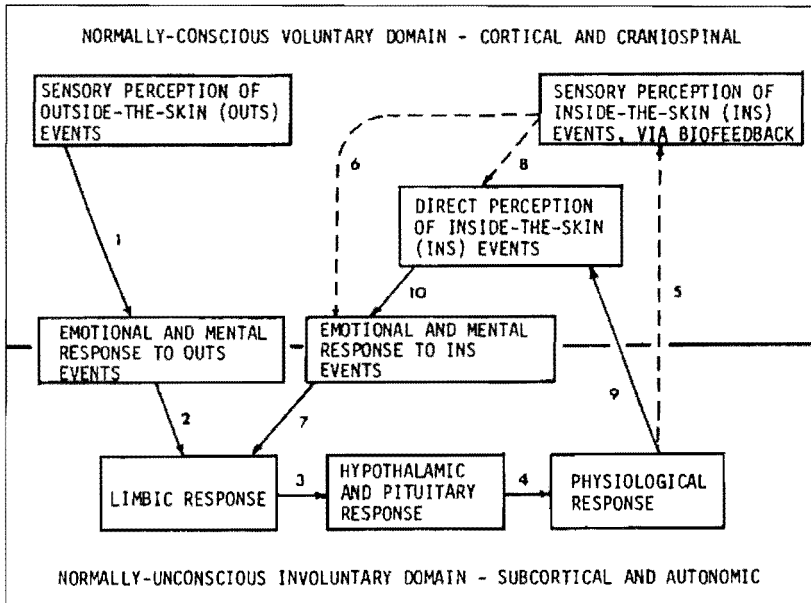
A related idea in regard to the neurological and psychological ordering of society as a whole, rather than ordering only the mind/body of an individual, was well expressed some decades ago by F. S. C. Northrop.<sup>32</sup> It supports the thought that in a distant future, individual self-mastery will be the *sine qua non* of a well-ordered society.

## PSYCHOPHYSIOLOGIC ANATOMY

It is useful to summarize some of the more important psychoneurologic concepts to which we have referred. Figure 3.2 represents the CNS and also the most self-apparent parts of the psyche, the emotional and mental parts of ourselves.<sup>9</sup> The caption explains in condensed form how the system works.

The basic neurological and neurohumoral information associated with the diagram was known several decades ago,<sup>33-35</sup> but the self-regulation aspect associated with biofeedback training, and its relation to the idea of *voluntary*, was not described before the 1960s.<sup>5,6,36-41</sup>

The most significant implication of Figure 1 is that self-regulation training is first of all awareness training (see box labeled "**Direct Perception . . .**").



*Figure 3.2 Simplified operational diagram of "self regulation" of psychophysiological events and processes: Sensory perception of OUTS events, stressful or otherwise (upper left box), leads to a physiological response along Arrows 1 to 4. If the physiological response is "picked up" and fed back (Arrow 5) to a person who attempts to control the "behavior" of the feedback device, then Arrows 6 and 7 come into being, resulting in a "new" limbic response. This response in turn makes a change in "signals" transmitted along Arrows 3 and 4, modifying the original physiological response. A cybernetic loop is thus completed and the dynamic equilibrium (homeostasis) of the system can be brought under voluntary control. Biofeedback practice, acting in the opposite way to drugs, increases a person's sensitivity to INS events and Arrow 8 is eventually unnecessary because direct perception of INS events becomes adequate for maintaining self regulation skills. [Physiological self control through classical yoga develops along the route of Arrows 7-3-4-9-10-7, but for control of specific physiological and psychosomatic problems biofeedback training seems more efficient.]*

In biofeedback training, the cortex, in which presumably we are conscious, becomes aware of what the biofeedback device "says" and knows what that means in respect to the body. This knowing, when accompanied by appropriate visualization (in the box labeled "**Emotional and mental response to inside-the-skin events**"), is followed by the development of direct physiological awareness, internal feedback. Finally, skill in self-regulation of the CNS is achieved, without machines, including large or small sections of the system formerly thought to be completely autonomic and unconscious.

## PHYSICAL CONSCIOUSNESS

**B**iofeedback training, when used properly, is a potent tool in visualization training because of its powerful effects in developing simultaneous awareness of both psychological and physiological processes. And skill in visualization is the essence of *psychophysiological* self-regulation.

On the other hand, biofeedback used as a conditioning tool, rather than as an aid in developing consciousness and self-regulation, has had consistently negative clinical results. For instance, fifteen of the first sixteen published research studies using biofeedback for control of hypertension either failed completely or had statistically significant results that were *clinically* insignificant. That is, a sufficiently large *n* made the results satisfactory for statisticians, but the actual blood pressure changes were too small to have clinical value.<sup>42-48</sup>

These research failures were generally well designed from a conditioning point of view and used excellent statistical methods of data handling, but were clinically defective. Specifically, successful clinicians do not use methods in which the patient is prevented from (or not aided in) developing self-awareness. The research designs and protocols used in the above investigations satisfied those who favor control of subjects by instrumental conditioning, but these designs do not satisfy those who favor freedom from conditioning, increased consciousness, and success *by the patient* in developing skill in autonomic self-regulation.

The handicaps, limitations, and problems associated with conditioning type manipulation of human patients seem quite obvious to experienced clinicians, but the publish-or-perish culture of most universities has forced many researchers into hastily conducted and inappropriate studies. One professor, for instance, demonstrated that biofeedback for control of heart rate is “of no value whatsoever.” He used a large number of subjects (183 college sophomores), processed the data with impeccable statistics (did everything needed to satisfy research reviewers and journal editors), but provided his subjects with only *six 5-minute training sessions!* With an equally large *n* with the same statistics, and with six 5-minute training sessions, we could demonstrate that hearing (auditory feedback) is “of no value whatsoever” in

learning to play the piccolo. And doubtless we could get a paper published in a respectable refereed journal in a land where the the piccolo was not already known.

Researchers often do not pay the price necessary for clinical effectiveness, that of providing enough time for subjects to become aware, internally, of what is happening in the body (so that they no longer need feedback). In fact, some investigators make a point of the fact that subjects are not allowed to become conscious of what they are doing, and projects are conducted with double-blind conditions. Why such a general bias against “consciousness” has been maintained for so long is not easy to say, but this problem was persuasively handled (and should be completely answered) by a scientific paper in which it was clearly explained that the use of traditional experimental-psychology research designs in *clinical* research often includes serious errors of the type we have mentioned, as well as some basic statistical errors.<sup>49,50</sup> Having been involved directly or indirectly at The Menninger Foundation in the self-regulation training of over 1500 patients, about 80 percent of whom have succeeded in significantly ameliorating syndromes, we are pleased to note that these problems are beginning to get attention.<sup>51,52</sup>

**T**he single early research study that reported success at follow-up in training hypertension patients had a clinical design in which home practice of “shivasan,” a traditional yogic practice for deep relaxation and bodily self-awareness, was used in conjunction with laboratory feedback of galvanic skin response (GSR).<sup>53,54</sup>

In contrast to the above-mentioned conditioning studies (in which consciousness was ignored), our own work in the field of hypertension uses a variety of self-regulation techniques including thermal biofeedback (emphasizing increased blood flow in the feet), striate muscular relaxation, breathing exercises, and autogenic training, which includes visualization.<sup>55</sup> We stress self-awareness, blood flow control, blood pressure reduction, and medication reduction. In the first series of patients, six out of seven who had been using prescription medications for hypertension (from six months to twenty years), were able to self-regulate their blood pressures and at the same time reduce their medication levels to *zero*.<sup>56</sup> Later, additional hypertensive patients were trained, many in groups, with similar positive results.<sup>57</sup>

Our medication-free patients attributed maintenance of their success over a long period of time (the longest follow-up was ten years) to being able to maintain the self-awareness and self-control that developed during their original training. An important feature of their success was freedom from the generally deleterious side-effects of their medications. The pleasure expressed by these patients at having well-functioning bodies made it obvious that *the physical state of consciousness is a part of mental health.*

**T**he biofeedback literature now includes several thousand research and clinical reports on the treatment of pathophysiologic syndromes of both psychosomatic and nonpsychosomatic origin.<sup>58,59</sup> The list of syndromes includes anorexia, bradycardia, blepharospasm, cancer, colitis, diabetes, epilepsy, esophageal spasm, fecal incontinence, foot drop, fibrillation, glaucoma, hypertension, insomnia, migraine, multiple sclerosis, nystagmus, oculomotor spasm, pain of various types, psoriasis, Raynaud's disease, strabismus, tachycardia, tension headache, tinnitus, and more.

**The Placebo Effect.** It is significant, in considering states of consciousness, that most of the above syndromes can often be temporarily ameliorated by the use of placebos (medically innocuous procedures, or "sugar pills"); and it is this wide range of syndromes responding to biofeedback training that originally led many psychologists and physicians to classify biofeedback training as a placebo—not realizing that *the placebo effect is unconscious self-regulation, whereas biofeedback training is conscious self-regulation.* Originally it had been thought (erroneously) by many researchers and clinicians that the placebo effect was imaginary. Nothing could be further from the truth. When a placebo slows the heart rate, that is real. When it changes gastric secretions, that is real. And now it has been shown that when the placebo "controls" pain, it does so through the release of endorphins, the endogenous morphine-like substances of the body.<sup>60</sup> The placebo has proved to be the most generally pervasive factor in drug research, and every study designed to demonstrate the effectiveness of a new wonder drug must be carefully planned to eliminate the placebo effect.<sup>61</sup>

What is happening here? How can a sugar pill release endorphins, or cause the heart rate to decrease or increase (depending on what the physician tells the patient about the pill)? Answer: The placebo effect is determined by what the patient expects, and therefore visualizes, consciously or unconsciously. The

placebo effect is generated in the patient's body by manipulating the patient's imagery and state of consciousness. The effect does not last, however, and cannot last, because the patient does not intentionally and knowingly use the visualization, is not aware of the fact that the effect is a physiological resultant of the visualization, and is not causally related to the pill.

As mentioned, sooner or later the sugar pill "does not work." That is why it is sometimes jokingly said in medical circles that the best time to use a new wonder drug is during the first year it is on the market. After that, the placebo component of the physiological effect dies out, and the drug may actually be found to be totally ineffective, like a sugar pill. On the other hand, when the patient experiencing psychophysiological therapy becomes aware of the fact that visualization is the active ingredient in physiologic self-regulation, and learns to use it effectively, genuine self-reliance and self-control are achieved. And they tend to last.

**T**he placebo works at first because the patient has been induced (more bluntly, tricked) by the doctor's description of effects, into visualizing what the body is going to do as a result of taking the "medicine." If the physician speaks Japanese to a patient who understands only English, however, the placebo effect presumably will be absent, or at least highly reduced. The patient might not know what to expect. It is interesting that the placebo (unlike acupuncture or tender loving care) does not work with babies or dogs. They do not understand, and do not visualize what is "supposed" to happen.

The reason a placebo stops working is that the patient begins to use the pill *habitually*, in an absent-minded way, without thinking each time, for instance, "this medicine slows my heart rate." The novelty is gone. Heart slowing as a consequence of pill taking, is taken for granted. The visualization stops. At this point, heart rate slowing no longer follows the swallowing of the pill. After this occurs a few times, the patient begins to think, "Maybe this medicine is not as effective as I thought it was." Confidence, an ingredient of effective visualization, diminishes, and a negative, skeptical, or pessimistic visualization begins to reverse the formerly positive placebo effect.<sup>62</sup>

In psychophysiological therapy using biofeedback training, on the other hand, the amelioration of the syndrome is brought about by the patient's voluntary

conscious visualization, guided by information. The patient is *self-aware*, and is conscious of creating the visualization. And that is no sugar pill. To quote an advertisement, it is “the real thing.”

When clinical biofeedback came into focus in public attention, the entire field of self-regulation was brought abruptly under medical scrutiny. The patient's capacity to bring about physiological change through visualization began to be understood. Suddenly it became clear to most of those working in the field, that yoga, biofeedback training, hypnosis, self-suggestion, placebos, certain forms of meditation, all had something important in common—namely, visualization. Not necessarily mental pictures, but imagery of all kinds, verbal, pictorial, emotional, kinesthetic, depending on the nature and preferences of the visualizer.

**T**he initial shock and controversy triggered by the emergence of a capacity in the average person for autonomic self-regulation is beginning to die away, and the main research question in the field of self-regulation is no longer “Is it?” but “How is it?” How can an idea become an enzyme? It may be a long time before that question is answered scientifically, but the yogic answer is that the mind, emotions, and body are states of energy/substance as well as states of consciousness, and all the body is in the mind, not all the mind in the body. The body is simply the densest section of the mind.<sup>63</sup>

Scientifically, the answer to the question about the “how” of autonomic self-regulation would seem to be the same as the answer about striate (voluntary muscle) self-regulation. Each kind of control, striate or autonomic, is preceded first by visualization and then by volition. We spent years as children learning to get the striate system under control, aided by exteroceptor and interoceptor feedback to the cortex. And now, with machine-aided feedback to the cortex, we are learning to use visualization and volition to get autonomic mechanisms under control. The ultimate question—how can anything be intentionally controlled in the CNS through visualization and volition?—cannot be answered by science, but for entertaining philosophical and psychophysiological discussions of the subject, see *Consciousness and Self-Regulation: Advances in Research and Theory*.<sup>64</sup>

## EMOTIONAL CONSCIOUSNESS

As previously mentioned, the limbic system has been called the emotional brain, the visceral brain, and it is now becoming clear that as we learn consciously to control the homeostatic levels of visceral behavior (with all that implies about the autonomic nervous system), we gradually become aware of the emotional states associated with both good and bad visceral homeostasis.<sup>65</sup> It should be remembered that homeostasis means balance around a specific level of physiological functioning. Of itself, homeostasis is neither good nor bad. If our stomach is healthy, homeostasis tends to keep it that way. If, on the other hand, we have a stomach ulcer, homeostasis tends to keep it that way. And when we appear to “train the viscera” with biofeedback procedures to be calm and quiet in the face of stress, we are actually training the emotions to become calm and quiet in the face of stress. The visceral state reflects the limbic state. Psychological homeostasis and physiologic homeostasis appear to be highly correlated. The extent to which in each of us they do not *seem* to be fully correlated, perhaps is one measure of the extent to which we are unconscious.

**A** good example of this body/emotion phenomenon was reported by psychiatrist James Howerton.<sup>65</sup> A thirty-year-old woman who had suffered from irritable bowel syndrome for fifteen years was referred to him by another psychiatrist, who in turn had received the patient from an internist. She had taken a variety of prescribed medications continuously for several years, and had become “a veritable authority on Freudian psychodynamics,” but without relief. It was stressful to her to be more than 100 feet from a bathroom, and she was becoming suicidal over the fact that she could scarcely leave her house. Both physical and emotional equanimity were chronically nonexistent.

In line with the concept that “cortical awareness of dysfunctional autonomic behavior is the first requirement in gaining voluntary control of such behavior” (not simply recognition of the problem, but awareness of the specific piece of autonomic behavior involved), Howerton used an electronic stethoscope, taped to the patient’s abdomen, to bring bowel sounds to consciousness. A technical difficulty at first was that the microphone did not amplify the sounds enough. Auditory feedback did not adequately precede colonic spasticity. The woman’s husband suggested that a plastic bowl with the microphone taped to the inside



(similar to a parabolic reflector), might give additional amplification of low-frequency rumbles.

After experimentation with different-sized bowls, the procedure worked, and through audio feedback the patient was able to become aware of impending disaster a few minutes in advance of the event. Howerton supplied his patient with “organ specific” autogenic phrases that were aimed at quieting the unnecessary motility of the GI tract, phrases such as, “my abdomen is calm, quiet, and peaceful”; “warmth and quietness are spreading throughout the whole lower section of my body”; “my entire GI tract does its work smoothly and quietly with no unnecessary activity.”

**A**s the body came under control of the mind, the emotional upsets came under control, and within five months the woman was “a new person,” off drugs and leading a normal life. Howerton did not find it necessary in this particular case to find out whether a specific emotional problem was the original causative agent of the syndrome (through limbic-hypothalamic effects reflected in the autonomic nervous system), or whether a viral flu or some other “outside” factor caused the original spasms, which in turn led to upset and negative emotions (i.e., led to the kinds of emotions that alone, with no outside help, can upset healthy physiological homeostasis), which then perpetuated the problem in a vicious downward spiral of colitis, then greater, “neg-emotion,” then worse GI symptoms and greater neg-emotion, and so on. Without identifying the particular psychodynamics involved, it was clear that this particular patient had a bad habit of responding to life stresses in a gastrointestinal way. When that fact finally came to consciousness, and a conscious skill at autonomic self-regulation was achieved, “the problem went away.” Since 1972, neither that problem nor any other visceral dysfunction has appeared, and the patient jokingly told Dr. Howerton that he had deprived himself of a patient who could have afforded a psychiatrist for the rest of her life.<sup>66</sup>

In some cases, however, as long maintained in psychoanalytic theory, it seems to be necessary for buried emotional events to come to consciousness before surcease from physical/emotional disorders is reached. For example, a fifty-year-old woman referred by a psychoanalyst to us in 1973 for training in self-control of somatic symptoms (fainting, heart irregularities, vomiting—all apparently associated with overreacting to “ordinary life stress”), was trained in

hand warming (her dominant right hand) and in forehead EMG control. This was accompanied by breathing exercises and the instruction that the resultant voluntary physical sensations of deep quietness should be allowed to spread throughout her entire body. After a few weeks of home practice with a portable temperature feedback meter, and weekly sessions in the clinic to report on the development of self-awareness in body, emotions, thoughts, and fantasies, and to practice muscular relaxation aided by an EMG machine, she reported that the left side of her body seemed “to be frozen.” On checking her reported lack of thermal symmetry, it was found that during sessions her left hand remained 16 degrees F cooler than the right (80 degrees F versus 96 degrees F). Thermal training was then shifted to her left hand.

Three weeks later during a lab visit, she demonstrated equal warming with both hands, and said that during home practice with the left hand she had suddenly, out of the blue, begun thinking about long forgotten events that had happened twenty-five years earlier.

**W**hat she had really wanted to be in life, she said, was an opera singer. But one day, when singing with a church choir, she suffered an abrupt and total voice block. She became faint and other members of the group supported her until the performance ended. After this happened a second time, she visited her physician for advice. His simple suggestion was, “Give up singing.” This she did, and it was then that her serious emotional/physical problems began. During the next twenty-five years she suffered continuously from a variety of physical and emotional upsets, she said, despite two five-year rounds of psychoanalysis. Not realizing her own direct responsibility, she said to us, “For the last twenty years my body has been trying to kill me.”

Very interesting. The body, the innocent victim of the CNS, was blamed for what it supposedly was doing to the psyche. Some people live in their heads to such an extent that they are almost unconscious of the body except when it malfunctions. And then they feel they are cursed with a defective or malevolent biological apparatus.

Especially interesting in light of findings in left-right hemispheric functions is the fact that it was the left side of her body that seemed “to be frozen,” and

it was the corresponding (contralateral) side of her head, the “singing side” (right cortex), that presumably suffered the functional block.<sup>67-69</sup> When the *left* hand was warmed, she “remembered” that what she had really longed to be (until she lost her voice in church) was an opera singer.

This precipitated a good mind/body recovery. She began to relive and resolve the events of a religious crisis, and soon was able to live without psychiatric help for the first time in twenty-five years, take a plane trip alone to return to her home state and take charge of the family business. She returned to church and became the director of a young people’s choir, visited people in other cities, and eventually began planning a tour of Europe.

**I**n our clinical view, supported by many such cases, there is no such thing as learning to control the body alone in a *self-regulation* paradigm, without emotion (without the limbic brain), as if psyche/soma could be fractionated under self-regulation conditions. Changes in states of consciousness seem to be the *sine qua non* of psychophysiological therapy in our practice. It is a convenient fact that our bodies can tell us something about our minds, something about deeply buried emotional states.

## MENTAL CONSCIOUSNESS

In attempting to differentiate between mental and emotional consciousness it is useful to consider the differences between thought and feeling, between intellect and desire (or aversion), between rational and a-rational, between mathematics and aesthetics, between figure and ground, between specific focus of attention and Gestalt awareness, between deductive-inferential and intuitive mentation, between dispassionate and passionate, between CPAs and free spenders, and so forth. It is not suggested, though, that there are many examples of pure thought or pure emotion. Most real-life examples are mixtures of the two and often have, in addition, a strong body component.

Nevertheless it is possible to discuss biofeedback and mental states of consciousness in: (1) consciously *getting* intellectual information from the unconscious, and (2) consciously *putting* information and instructions into the unconscious; or, as John Lilly might put it, first interrogating the human biocomputer, and second, programming the human biocomputer.<sup>70</sup>

“Getting answers from the unconscious” was a phrase used by psychiatrist Johannes Schultz.<sup>55</sup> It depends on a state of awareness in which normally hidden information of the psyche can come to consciousness, in a hypnagogic-like way, in response to need and to a conscious request for information. As explained by Schultz, a necessary psychophysiologic precondition, without which this mental process is inoperable, is that the requester first move into a psychophysiologic state of “autogenic shift.” This state (very different from the usual presleep condition) is one in which the body, emotions, and mind are all quiet at the same time. The body approaches sleep, the emotions are deeply quiet, but a volitionally stilled receptive mind is *alert*, and not aimlessly wandering or daydreaming.<sup>71,72</sup>

The state of autogenic shift is reachable through classical Autogenic Training, through meditation, and in other ways (as many have testified over the decades), but one of the simplest ways is through biofeedback training. Biofeedback training has an advantage in our modern technological society of using what is perceived to be a “scientific” approach. For some purists (whether meditators or psychotherapists) who may not usually think of the body as being part of the mind, the psyche’s use of a machine aided approach to the unconscious seems either blasphemous or artificial, but for the average layperson who asks for help with physical, emotional, or mental difficulties, biofeedback training seems very natural after the rationale of self-regulation training is fully explored (Figure 3.2).

## INTERROGATING THE UNCONSCIOUS

**I**nto the state of autogenic shift, this multiplex state of quietness and alertness, the question for which an answer is desired is projected by the conscious “mind,” with a request for a response. This is followed by a return to the state of quiet alertness in anticipation of a hypnagogic answer.

If a person can easily slip into the state of autogenic shift, biofeedback training may not be needed for getting information from the unconscious, but for most unsophisticated persons (and especially for extreme “left cortex” intellectuals) it is most productive in learning autogenic shift to first use thermal and EMG training, and follow this with brain wave (EEG) training.

In autogenic training, *two* of the psychophysiological conditions needed for autogenic shift are warmth in the peripheral parts of the body and an overall body sensation of heaviness (or lightness, in some cases). In biofeedback, thermal training accomplishes the warmth condition, and EMG training accomplishes the heaviness condition. It is interesting to note that the feeling of warmth in the periphery has a correspondence with quiet emotions, and the physical feeling of heaviness, which is quietness in the striate nervous system, has a correspondence with deep relaxation.

**W**armth in the periphery relates to emotional quietness because hand and foot warming depend largely on increased blood flow, which depends on vasodilation, which in turn depends on “turn-off” (decrease) of firing in the peripheral vascular section of the sympathetic nervous system and control thereby of the behavior of smooth muscles in blood vessel walls (peripheral vasodilation). And when this voluntary turn-down of sympathetic firing is established through biofeedback-aided visualization training, which seems to mean that the limbic brain is involved in making appropriate changes in hypothalamic circuits, the psychological result, or cause, or correlate, is emotional quietness.

In the other direction, *increased* sympathetic firing results in peripheral vasoconstriction and peripheral cooling, and is almost always associated with emotional activation. It is necessary to say “almost always” because unconsciously skillful patients and consciously skillful yogis can sometimes make the parts of the nervous system function in independent and disconnected ways.

A *third* condition of autogenic shift in getting answers from the unconsciousness is for the mind to be alert but not active. This is often accomplished in our practice of psychophysiological therapy through occipital theta brain wave training.<sup>9</sup> In order to understand the general significance of theta training (and here we get into an area in which, to the best of our knowledge, most biofeedback practitioners have not worked), it is useful to consider the difference between the voluntary production of alpha rhythm and theta rhythm.<sup>73</sup>

Conscious alpha production for most people means relaxing in their usual way, with the eyes closed. Ninety percent of the human population normally produce some occipital alpha under these conditions, whether daydreaming or

not. Interestingly, it is quite easy to learn in a few brain wave training sessions, using auditory feedback, to produce occipital alpha with the eyes open but unfocused. Conscious *theta* production, on the other hand, is much more difficult (based on our own experience, on research experience with college students and others, and on clinical experience in our Biofeedback Center over the last ten years).

Many people cannot succeed in causing the theta tone to sound in an EEG feedback-machine unless they are almost asleep. Then, when the tone sounds, they return to “alpha or beta attention” so quickly that the theta state is eradicated. The task is to develop alert internal attention without eliminating the theta rhythm. The trainee must learn to “hear” the theta feedback tone without changing the state of consciousness toward “normal”, thus causing the theta state to disappear. It is necessary to learn to remain alert in the so-called twilight state of consciousness.

**M**any pages could be written about theta brain wave training and the associated subtleties of consciousness. Suffice it to say that in our estimation the evidence strongly suggests that “voluntary hypnagogic imagery (whether the achievement follows theta biofeedback training, or comes from some other volitional methodology) will eventually become “the royal road to the unconscious,” rather than dreams or hypnosis.<sup>74,75</sup> Concerning the significance of the hypnagogic state, Lawrence Kubie commented:

The hypnagogic reverie might be called a dream without distortion. Its immediate instigator is the day’s “unfinished business,” but like the dream it derives from more remote “unfinished business” of an entire lifetime as well. . . . Whatever the explanation . . . with [hypnagogic reverie] significant information about the past can be made readily and directly accessible without depending upon the interpretations which are requisite in the translation of dreams. . . . It is probable that in this partial sleep, in this no-man’s land between sleeping and waking, a form of dissociation occurs which makes it possible to by-pass the more obstinate resistances which block our memories in states of full conscious awareness, and which contribute to the distortion of memory traces in dream. . . . The patient’s free associations seem to flow with extraordinary freedom and vividness, gravitating spontaneously to early scenes and experiences with intense affects, yet without the multiple distortions that occur in the dream process.<sup>76</sup>

In our view, hypnagogic imagery that is self-obtained, without trance induction or programming by a therapist (as in hypnotherapy), is especially useful. As Barber has indicated, results in hypnosis are often reflective of the therapist's attitudes and emotions rather than the subject's.<sup>77</sup>

An excellent example of "interrogating the unconscious" with the aid of theta training occurred in our lab when a biofeedback technician (at a Topeka hospital), himself skilled in EMG and blood flow control, and successful in training others, began to suffer from what seemed to be a form of colitis associated with "spontaneous" anxiety. Marty (an assigned name) had mentioned this problem to us, but not until he said that it was not responding to sympathetic quieting did we begin to suspect deeper causes than normal life stress. He obtained medical opinions from two physicians, following a "work up" of the GI tract, but no physical causes could be found, and he was advised to talk with a psychotherapist.

**A**fter a few nonproductive psychotherapy sessions, Marty asked if we would advise him on getting information about the problem from the unconscious. A student and teacher of Patanjali yoga, he felt that every cell of the body was a "cell" of the unconscious and the unconscious therefore had in it information about every part of the body. And because the unconscious was a section (region, aspect) of mind, it could generate a proper form of communication with the conscious mind. He was also acquainted with the kinds of hypnagogic imagery obtained by college students in our theta training research project.

It was suggested that he prepare a specific question in which a visualization of the problem would be presented to the theta-state unconscious, essentially following the procedure outlined below under "Programming the Unconscious," asking for specific information about his GI difficulty.

From previous experience with brain wave training, it was not difficult for him to become quiet enough to produce theta rhythm in the left occiput. Auditory feedback and a duration-integrator attached to the EEG machine showed that after a few minutes of mostly alpha production, he was able to produce theta about 20 percent of the time. At the end of the second session he described a hypnagogic image that had "popped" into awareness. A part of the intestinal

tract was “seen” as thick and tough, rather than flexible, and in it knobbly blood vessels were becoming brittle and beginning to crack. We discussed this image and considered with him what it might mean. A couple of days later, at our suggestion, he returned to the physician who had been particularly friendly and told of his imagery, referring to it as a kind of dream. After further medical tests Marty’s problem was diagnosed as Crohn’s disease (an intestinal problem having some of the features he had described).

Under “Transpersonal Consciousness” (below), we will discuss Marty’s attempts to control Crohn’s disease through organ-specific visualization (which in his case did not succeed) and describe his eventual reinterrogation of the unconscious for an explanation of the problem.

Some interesting research ideas have come from theta training. For instance, one of its values seems to be the deeply peaceful state that is achieved. When normally buried information comes to conscious while the patient is in this state, he or she seems to be buffered against limbic overreactivity. Is there a neurochemical or neurotransmitter correlate here?

The patient may be uncomfortable with what is “dredged up,” but information seems to be “metered” in a way that makes it tolerable. The unconscious seems to have an innate wisdom that may be protective when we ask for “answers from the unconsciousness.” This is not contraindicative of the yogic idea that the unconscious includes not only the reactive “subconscious” but also a wiser “superconscious.”<sup>7,15,78</sup>

## PROGRAMMING THE UNCONSCIOUS

**O**ne of the most interesting facts that psychophysiologic therapists become aware of in the course of working with different patients and a variety of syndromes, is that patients learn how to reprogram, by themselves, specific physiologic and psychological mechanisms. Johannes Schultz Implemented this possibility when he created the idea of the “organ specific formula” phrased in the first person, and made it an essential therapeutic tool of autogenic training. (For those not directly acquainted with autogenic training, an organ specific formula is a positive verbal statement in which the patient outlines for his or her own body the desired behavior of a body organ, or organ system, or congeries of systems.)



To be most effective, an organ specific formula is used by the patient while in a state of autogenic shift, while the body, emotions, and mind are quiet. It is important to note that the same conditions of quietness that enhance the process of getting answers from the unconscious can be used in programming the unconscious. Budzynski and Peffer, for instance, developed an ingenious way of teaching languages while the student is in a passive nonvolitional theta state.<sup>79</sup> But in our practice of psychophysiological therapy, the organ specific formula is *actively* implemented through visualization, and biofeedback devices are used by the patient (1) for discovering what the body is actually doing in response to a specific visualization, and (2) for correctly modifying the visualization in order to get a desired physiological and psychological result. A “good” visualization for one person may be a “bad” one for another, but through the use of biofeedback each person can tailor-make his or her own most effective imagery, whether auditory (verbal), visual (mental pictures), emotional, or kinesthetic (body sensation).

**D**espite their many similarities, in this concept of *self-programming* biofeedback training and classical autogenic training are not the same. In biofeedback training there is a great deal more emphasis placed on the patient’s own capacity to make decisions, to shape the organ-specific visualization, and to take self-responsibility.

As mentioned previously, heaviness and warmth training with EMG and temperature feedback machines help the patient get into the state of deep quietness of body and emotions, and theta brain wave training helps develop the deeply quiet but alert mind. As indicated, these different kinds of feedback used in concert are often powerfully effective in helping a person move toward awareness of the unconscious, but on occasion each *alone* will span the entire distance. That, is, these different kinds of feedback are not mutually exclusive in their effects, and on occasion individuals will move into a theta brain wave rhythm as a result of warming the hands (to above 95 degrees F and maintaining that temperature for a few minutes). But on average, theta training *following* EMG and temperature training is considerably more effective in producing the “theta state” than temperature training and EMG training, either alone or together.

Developing deep mental quietness simultaneously with mental alertness is not easy for most people, even with theta brain wave training. Nevertheless, that

training is a relatively simple method that Westerners can use without long yogic practice. And to be able to enter the theta state at will is an important accomplishment, we believe because, as stated above, the same state of deep quietness that is used in getting answers from the unconscious can also be used in programming the unconscious for physiological and psychological change. In the list below, note the opposites and parallels:

getting answers	programming behavior
sensory behavior	motor behavior
passivity	volition
imagery	visualization

In beginners, the problem of achieving deeply quiet mental alertness is doubly complicated by the fact that unlike the situation with psychophysiology self-regulation experts such as Jack Schwarz, visualization and volition tend to destroy the passive-receptive conditions of the unconscious that are needed for successful programming of the body-mind.<sup>9</sup> This obstacle can be surmounted over a period of time by having the patient, or research subject:

Practice with EMG and temperature feedback devices until deep muscle relaxation is achieved and the hands can be warmed to more than 95 degree F and held there over a period of several minutes.

**P**ractice with alpha-theta feedback until it is possible consciously to generate theta more than 10 percent of the time (this may take several sessions). As already mentioned, this state can be used for both interrogating and programming the unconscious. Interrogation has been discussed above. For programming:

1. Move first into a state of EMG quietness and peripheral warmth.
2. While in this state, *construct* the visualization that is to be planted in the unconscious, a visualization that has already been carefully planned by the cortex, with ambiguities eliminated (for the unconscious is like a computer in some ways, and tends to take instructions literally).
3. Allow awareness to sink down into the theta state with the idea that the unconsciousness is now listening; it is now in "record mode."

4. Gently project the visualization into the “field of mind” as a *Gestalt*, with as little left-cortex activity as possible.
5. Terminate the session with a quite command, such as “do it,” “so be it,” “the instruction is now terminated,” or the like, in order to terminate unconscious receptivity (similar to using the “enter” key in programming a computer).
6. Bring awareness back to the surroundings carefully so as not to disturb the planted instruction.

Questions, doubts, anxieties, and all such cortical probes and limbic fears are held in abeyance. Thoughts such as “On the other hand . . .” must be checked. Farmers do not dig up their just-planted seeds to find out if they are beginning to sprout, and patients must be trained to have patience when learning to program the unconscious.

**I**f a problem is purely psychological, that is, without any *obvious* physiological correlates, there is no easy way of determining, after the difficulty is gone, whether it was the conscious or the unconscious that was reprogrammed (see the voluminous literature on hypnosis). But in physiologic cases, results are sometimes so remarkable (such as wounds healing at double speed, or intractable abscesses clearing up in a few days), that there is little doubt that normally involuntary unconscious biological mechanisms controlled by the hypothalamic-pituitary complex have been powerfully stimulated by autogenic (self-created) visualization, and these have caused the body to move toward healthy homeostasis.

The methods described above for programming the unconscious are often useful, not only in preparing for a stressful future event, possibly in sports, but also in handling upcoming physiologic crises. For instance, several clients of our Biofeedback Center have undergone visualization training in preparation for surgery. Without going into detail, it can be reported that after the client has learned to quiet the striate and sympathetic nervous systems through EMG and temperature training, we use guided imagery to help him or her move through a mental, emotional, and physiological scenario of the operation, in which the behaviors of the various aspects of body/mind are rehearsed. It is not spontaneous hypnagogic imagery that is wanted here, but guided imagery. If, however, the patient produces hypnagogic imagery under these conditions,

we pay close attention to symbolic meanings, and work with the patient in clarifying implications.

Patients then practice on their own, at home, using the basic ideas of the “guided” session to construct appropriate scenarios, adapting them to changes in the situation as needed. Prior to surgery, in the hospital, relaxation and visualization are again practiced.

Physicians and nurses have reported that rapid healing in intensive care and complication-free recovery have characterized the experience of these patients. And the patients often have been exuberant. Some of them felt so well after surgery that they wanted to return home before their physicians were ready to release them.<sup>80</sup>

A great deal of research remains to be done in this application of mind/body control, and the literature on self-hypnosis shows that there is interest in the possibility of devising scoring techniques for evaluation of effects.<sup>81</sup> Since physicians and nurses, as well as the patients themselves, are observers of recovery after surgery, it might be possible to devise physiological scoring methods that would provide hard data in this area.

## EXTRAPERSONAL CONSCIOUSNESS

**I**n the previous discussion of the meaning of “extrapersonal,” we referred to experience “beyond the normal limits of the ego and the personal unconscious, into cosmic nondivine awareness.” And we also used such terminology as psychic, astral, magical, parapsychological and Halloween. An out-of-body experience certainly has many personal features, but since perception without the use of the normal body organs seems to occur in ways that are “beyond the normal limits of the ego,” we classify such phenomena as extrapersonal, or as extending into extrapersonal dimensions of experience.

The five experiential categories of this chapter can be thought of as occurring in five non-mutually-exclusive domains. In fact, it is affirmed by highly respected students of states of consciousness, such as Aurobindo, Patanjali, and Evans-Wentz, that these domains are energy/substance “fields” that, in humans,

are fully interpenetrating. They are not the same, but they are coexistent and coterminous, just as magnetic, electrostatic, electromagnetic, and gravitational fields can be present in the same space at the same time—just as the broadcast fields of radio stations and television stations, though not the same, are present in the same space at the same time.

Again differentiating between extrapersonal and transpersonal, an out-of-body experience may be the subject of investigation in parapsychological research, but there is no necessary implication that it is transpersonal.<sup>82-84</sup> In fact, it might include a visit to “hell,” if we are followers of Swedenborg or if we project into a bad “locale.”<sup>85-88</sup>

**A**t a 1972 biofeedback workshop in Kansas city, one of the first-time trainees, who practiced hand temperature control with a feedback device and autogenic phrases for half an hour, asked what it meant when you see yourself from a distance.” He said that he became deeply quiet and his hands grew very warm, and then he suddenly was on the other side of the room, looking at himself sitting in the chair with the biofeedback machine in front of him. Also, he said, there was a bundle of gray “fibers,” like a gray rope, that went from him to his body. “What was that?” We talked for a while about yogic theory and psychic phenomena, and asked if this was a common occurrence with him. He said that it had not happened before, that he was not particularly religious, that several years ago in high school he had read about yogis controlling their hearts, etc., but he had been involved in the business world and had not thought much about the mind in the last few years.

It seems that out-of-body experience and other parapsychological phenomena are not as dependent on the particular biofeedback modality being used (temperature, EMG, EEG) as they are on whether the subject is able to slip into a “state of deep quietness,” somewhat similar to the “trance state” described in much hypnosis literature. Concerning “trance” as a state of consciousness, it is interesting to consider the possibility that in hypnosis, the researcher, or therapist, is “talking directly to the limbic system” of the subject, without the help (except acquiescence) of the subject’s cortex. In self-regulation training, on the other hand, the subject’s cortex may be said to be talking to its own limbic system.

In line with our general orientation toward volitional self-guidance, we seldom recommend that patients buy biofeedback machines. Instead, we lend them machines for home practice, and have them returned as soon as possible, usually as soon as self-regulation without the machine is demonstrated. Dependence on a machine implies that the cortex is not secure in its ability to program its own limbic brain through visualization. A few patients we know of became dependent on machines, and had to be “weaned off” so that genuine self-regulation could develop. We also discourage the use of cassette tapes for programming the unconscious, even those made by the patient for control of his or her own symptoms. We want patients to get the gains of physiological self-regulation, and also have a gain in consciousness, not be externally-programmed.

**A** number of attempts have been made in parapsychological research since the early 1970s to use biofeedback training for enhancement of extrasensory perception (ESP), but in general these projects have suffered from the same deficiency found in much biofeedback research; namely, not enough time is allowed for the training of subjects. In fact, three not untypical studies in parapsychological journals were contingent on what the authors erroneously called “alpha training.” In these studies training consisted of, respectively: (1) one alpha session of six 5-minute trials; (2) two alpha sessions, each of which contained two 15-minute trials; and (3) ten alpha training sessions, each of which contained four 4-minute trials. The last one mentioned totaled 160 minutes of training.

In our work with theta brain wave training, on the other hand, about 20 laboratory hours over a period of ten weeks were spent in theta brainwave training in a group of eight pilot subjects (including ourselves), and about 35 hours were spent in home practice without feedback devices. During lab sessions, three of the eight had hypnagogic imagery which included ESP material.<sup>9</sup>

In a follow-up experiment, 40 hours were spent by college students in occipital alpha/theta training, and even then only three out of twenty-six in the group had experiences that because of their parapsychological implications we could classify as extrapersonal. We were not trying to elicit or study ESP and precognition, however, and that research lead was not followed. During the investi-

gation with these students, the spontaneous ESP images that occurred were not particularly startling, as events, except in one case.

**V**al (an assigned name) had not had any previous ESP experience, but during the tenth week of alpha/theta training, spontaneous ESP began to occur, upsetting him because he did not “believe in such things.” These events were climaxed by a hypnagogic image, just as he was falling asleep one evening, of Governor George Wallace being shot in a crowd of people. It startled him and made him feel uncomfortable, but he dismissed it as a “bad dream.” Three days later, on the way to the lab for a meeting with us, he heard on his car radio that Wallace had just been shot. The circumstances were quite like his hypnagogic image, and he was visibly upset by the time he arrived. He did not want to know such things, he said. What was his responsibility in such a case? After thorough discussion we advised that in view of the scientific nonacceptance of precognition, and psychic phenomena in general, it was better not to discuss what he had “seen.” Six months later we had occasion to talk with him by phone, and found that he was doing well in graduate school, and the various kinds of psychic phenomena that he had experienced for about three weeks at the end of theta training had stopped, not to his regret.

Mental and emotional phenomena of this kind happen occasionally in the practice of client-centered biofeedback clinicians (those who tend to work with patients as *colleagues* in solving problems), and for this reason alone it is useful to be able to speak in terms of a specific states-of-consciousness category, extrapersonal, in which all unusual events are not automatically classified as transpersonal.

## TRANSPERSONAL CONSCIOUSNESS

In the previous discussion of the meaning of transpersonal, we referred to experience “beyond the normal limits of the ego and the personal unconscious, into universal, divine awareness.” We used words such as spiritual, transcendental, overmind, supermind, transc cosmic, ineffable, not nothing, and Easter; and referred to the Void of Tibetan Buddhism—which according to Evens-Wentz’s Tibetan teacher contains twenty-eight differentiable levels of nonverbal experience.<sup>8,89</sup>

To the best of our knowledge, there has not been any generally accepted biofeedback research in the transpersonal domain; but we have received verbal reports from workshop attendees (persons in the helping professions who are using biofeedback techniques to help clients become self-aware and self-regulated) that attest to the nonrarity of transpersonal experience.<sup>90</sup> If we can believe the data, transpersonal events happen at least once in the lives of more than 40 percent of our country's population, though they are seldom spoken of outside the intimate family.<sup>91</sup> Such events are sometimes triggered by psychophysiological self-regulation training. Consider the following.

Marty, whom we previously spoke of in regard to Interrogating the Unconscious, was relieved to find (on reporting his hypnagogic image to his physician and getting some additional gastrointestinal tests) that he had an identifiable problem, Crohn's disease. But the physician who worked with him was unable to find either a diet or any combination of medicines and diet that ameliorated the symptoms, and after a few weeks Marty began to detect intestinal bleeding during bouts of colitis.

**I**n discussing this more serious development, he again asked if we would advise him on the possible meaning of symbols in hypnagogic imagery, and he would again use an EEG theta state for interrogating the unconscious. After the second session, following in main the quieting protocol outlined under "Emotional Consciousness," he reported that possibly crucial information had come to consciousness, but he did not know what to do. He had quickly and easily slipped into the state of deep quietness, the theta tone almost continuously assuring him that he was in the appropriate brain wave state, and then he was suddenly a performer in a hypnagogic *movie*. He no longer was aware of the training room, the theta tones from the feedback machine, or his body in the reclining chair.

He was on the ground floor of a several-story dark building, and it was necessary to get to the top. There were no stairways, and the floors had been broken out so that the interior was a large empty shell. Searching through the gloom, he found that the walls were covered with ladders, and he began to climb. It was tiring, but after passing three or four floors he could see a sloping roof above. The sides of the roof came together in a pyramid, like the inside of the Washington Monument.



Energized by the sight of his goal, he soon reached the slope of the peak. There the climb was exhausting and scary. It was hard to keep from falling, and it was a long way down. Steeling himself, he pulled his way upward in the stuffy darkness against both gravity and fear. As he approached the place where the ladders from all sides came together, he realized with a sinking feeling that there was no way out. He was too tired to search anymore, and he just clung numbly to the ladder.

**S**uddenly with a crash and a flood of air and light, the peak of the building burst off. A brilliant and beautiful shaft of golden light streamed down, and a ladder began to descend. With incredible relief he moved to the new ladder (Jacob's ladder?). He said it was "grace" and a flood of warmth and love poured through him. He began climbing. But as his head neared the opening, he felt a weight and pain in his lower midsection. Looking down, he saw he was wearing a broad leather belt on which four iron rings were bolted. Tied to each of the rings were two long ropes that descended into the gloom. He saw that men and women had hold of the ropes and, as he put it, "I was being pulled in two." He recognized them. They were members of the Patanjali yoga class he was teaching, which he had led for eight or nine months. What was he to do?

Then a strong clear voice from above said, "You must let them go and come up alone first." Marty said he was suddenly convulsed by fear and anguish, and he shouted upward, "I can't. I won't come up unless I can bring them with me." With that, the ladder and light vanished, and the broken-off top of the roof fell back in place. It was dark and cold, and again he was clinging to a ladder inside the roof.

Then he became aware of the training room. He rested for a few minutes, turned off the brain wave machine, and shaken mentally and emotionally, came to report the imagery. It was true, he said, that the yoga study group stressed him. The reason was that he had become so sensitive to their problems that if anyone came to the weekly meeting with a hurt knee, the moment that person came in the door his own knee began to ache. Every problem they had, he could feel. They had begun phoning him at night about their troubles, and in advance of their calls, his solar plexus would begin to ache.

From his description of the bonds between him and the group, and from the apparent significance of the imagery, we suggested that it might be useful if he and his wife, both of whom loved the mountains (where Marty was always able to recuperate from stress), would consider moving to Colorado for a year or two, where he had said he had an opportunity for a different job, one in which he would not be “pulled on” by others. He might then have time to repair himself. If people are drowning, isn't it better to throw a rope from the bank, rather than try to tow them in the water, especially if you are not yourself a good swimmer?

His surprising answer was not lacking in self-awareness. He did not want to leave the group and go to Colorado. He could not comply with the hypnagogic instruction because of an inner promise he had made. In the Marines he had vowed he would never again leave a person in need. He had not been in combat, but during a forced march across the California desert, one of his buddies became thirst-crazed and began pulling up bushes and chewing the roots. They had been warned of the poisonous creosote bush, but his buddy ate the roots, and before help came he was dead. Marty could have fought with his buddy to prevent that from happening.

**O**n another occasion, when a group of marines was dropped from a helicopter into the surf off San Diego, with 40-pound machine guns attached to their belts, his closest friend had drowned. On hitting the water they were to pop self-inflating balloons to buoy up the guns. The friend's equipment did not work, and he plunged to the bottom. Marty struggled to shore, but he felt he should have jettisoned his own equipment and tried to dive for his friend. Never again, he said, would he leave friends, no matter what happened.

In a few weeks Marty developed peritonitis, and despite a desperate attempt by physicians and hospital staff to save him he died. His determination to live was unparalleled, his doctor said, and he survived weeks longer than anyone at the hospital thought was possible, in part because of the devotion of his wife, who cared for him in the hospital day and night. He was amazing, they said, but he died.

Marty's story is also the story of Franz Kafka, though the roles and circumstances are poles apart. In both cases they were told by an inner source what

the problem was, and in both cases the advice was not acted on. (See Kafka's novels, *The Trial and The Castle*, in which are detailed his own inner experience.)<sup>92,93</sup>

**T**he significance of Marty's experience is several-fold: (1) It illustrates the potential of a part of the unconscious to answer questions and give wise guidance. (This we have seen in many patients, but they did not have Marty's vow, which bound his life to a seemingly inevitable doom.) (2) It suggests that as individuals we are not powerless, but that we have an opportunity to make choices that affect our lives. (Marty consciously made a choice.) (3) It shows a risk, the possibility of being too self-willed, too personal rather than transpersonal—unwillingness to take advice from what may be a wiser Self. (4) The hypnagogic image explained that the physiology and the psychology were not separate, and implied that it was necessary to be healed in mind first. (5) The image suggested that taking on the problems of others before you have handled your own problems may be an error.

As we now think of Marty, we think of “the noble warrior” who, in a certain way, gave his life for his friends, even if there was no obvious gain for them. What the ultimate transpersonal meaning of his life may be, we do not know. With Marty's case in mind, it seems useful for both personal and transpersonal well-being to become self-reliant, self-programming, self-understanding, self-*forgiving*, self-regulated, and self-responsible, in whatever fields of experience are encountered. Ways of doing this in life and death situations have been reported by Cousins.<sup>94,95</sup>

In patients having transpersonal crises, training in self-regulation and self-dependence often leads to their finding in their own unconscious a source of knowledge and wise guidance that is superior to anything that we, as external therapists, can offer. We have un-originally called this phenomenon “becoming aware of Self.” This “center of self” appears to approximate in its salient characteristics what in Zen is called the True Self; and when it surfaces, we are always impressed by the insights and transforming ideas springing, like hypnagogic images, from the patient. Assagioli refers to the move toward self-regulation as the first step in transpersonal development.<sup>96,97</sup> The second step is integration *of* self, “personal psychosynthesis,” and the third step is integration *with* Self, “transpersonal psychosynthesis.”

## CONCLUSION

In reviewing the extrapersonal and transpersonal data presented, it seems useful to consider again the yogic idea that the various kinds of experience involve, and depend on, different kinds of energy/substance in an all-pervading energy field of some kind. As we work with patients having “ordinary” psychosomatic problems, it becomes increasingly evident that physical consciousness is not separate from mental and emotional consciousness. And as extrapersonal and transpersonal data accumulate, it seems more and more likely that superphysical energies (to use Aurobindo’s term) exist, and every human experience, no matter how “high,” or transcendental, is actually an experience in domains of reality not separate from substance.

Carl Jung made reference to this idea of other-dimensional reality in his Commentary on *The Tibetan Book of the Dead*:

For years, ever since it was first published the *Bardo Thodol* has been my constant companion, and to it I owe not only many stimulating ideas and discoveries, but also many fundamental insights. . . .<sup>98</sup> Not only the “wrathful” but also the “peaceful” deities are conceived as *sangsaric* projections of the human psyche, an idea that seems all too obvious to the enlightened European, because it reminds him of his own banal simplifications. But though the European can easily explain away these deities as projection, he would be quite incapable of positing them at the same time as real. . . . The ever-present, unspoken assumption of the *Bardo Thodol* is the antinomial character of all metaphysical assertions, and also the idea of the qualitative difference of the various levels of consciousness and of the metaphysical realities conditioned by them. The background of this unusual book is not the niggardly European “either-or,” but a magnificently affirmative “both-and.”<sup>99</sup>

In confronting a similar problem of proposing and explaining to Westerners transcendent experiential dimensions, and their “reality,” Aurobindo made the suggestion that if a person is embarrassed by the word “spirit,” then it might be useful to think of spirit as the subtlest form of matter. On the other hand, if the idea of spirit is not an embarrassment, then matter can be thought of as the densest form of spirit.

Judging from comments and questions at advanced biofeedback workshops, psychophysiology therapists having several years' experience with patients suffering from psychosomatic disorders are becoming increasingly interested in states of consciousness. Many of these clinicians have become convinced (through their own experience with biofeedback-facilitated self-awareness, through meditation, and through discussions with patients), that healing "energy" exists<sup>100,101</sup> and that both extrapersonal and transpersonal domains of experience consist of factual, rather than imaginary, energy states.

**T**here are as yet no scientific data, replicable in different laboratories across the country, that directly substantiate the existence of superphysical energies (such as photos that record these "energy fields" without using the Tesla-coil electricity of the Kirlian camera), but the belief is growing among some physicists, biologists, psychologists, and physicians that there are additional energy dimensions in which humans exist, and in which, and because of which we have extrapersonal and transpersonal experience.<sup>102-109</sup>

Whatever discoveries are made in this domain, there is no doubt in our minds that feedback methodology will prove useful in helping individuals become conscious of their own latent capacities to voluntarily control, and project in the Jung/Tibetan sense, physical, emotional, and mental energy. As these latent developments become manifest, a new horizon of ethics and responsibility, for others as well as ourselves, is bound to come in view.

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