MATURE CONTEMPLATION

by Charles D. Laughlin, Jr., John McManus, and Eugene G. d'Aquili

Abstract. This chapter extends biogenetic structural theory to a consideration of the biopsychological principles underlying higher phases of consciousness, particularly those attained by the systematic exploration of consciousness called contemplation. The concepts of psychic energy, flow, centeredness, energy circulation, and dreambody are explored as presented in various mystical traditions, and a model of the underlying neurophysiology is presented in terms of ergotropic-trophotropic tuning. The psychophysiology of various forms of meditation together with emergent peak experiences is examined and integrated into the ergotropic-trophotropic tuning model. Structural invariance of ergotropic-trophotropic tuning as well as invariant aspects of contemplation across different cultures and associated with different symbol systems is considered. Finally the nature and implications of Void Consciousness, God Consciousness, or Absolute Unitary Being are examined.

Keywords: Absolute Unitary Being; centeredness; contemplation; ergotropic-trophotropic tuning; flow; God Consciousness; meditation; neuropsychology; peak experiences; psychic energy; structural invariance; Void Consciousness.

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> Do you remember how that life yearned out of its childhood for the "great"? I see that it is now going on beyond the great to long for the greater. For this reason it will not cease to be difficult, but for this reason too it will not cease to grow.
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> —Rainer Maria Rilke, *Letters to a Young Poet*

> Neither common sense nor science can proceed without departing from the strict consideration of what is actual in experience.
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> —Alfred North Whitehead, *The Organization of Thought*

We have developed a theory of the structures of consciousness, showing how the nervous system as a community of cells organizes and reorganizes itself to mediate the flow of experience and alternative phases of consciousness into which strips of experiences congregate.[1] Furthermore, we have demonstrated how symbols operate to participate in their own meaning and in communication both between conscious and unconscious parts of the nervous system, and between the organism and the world. We have applied this theory to a better understanding of dreaming and shamanism. It is now our task to examine the biopsychological principles operating in higher phases of consciousness, and in particular, those attained as a consequence of various mystical practices.

The key to understanding the structures mediating higher phases of consciousness is to be found in the relationships of higher cortical processing and lower metabolic, autonomic, and endocrine activity. We will be centering our discussion primarily on those relationships producing phases of consciousness interpreted in various cultural traditions as *contemplation*, the systematic exploration of consciousness by means of trained introspection. In order to model those relationships, however, we must avoid the pitfalls of mind-body dualism, this time in the guise of different languages for speaking about phases of consciousness on the one hand, and the "somatic correlates" of those phases on the other. We will avoid dualism in this case by the simple expedient of introducing Gellhorn's unaccountably neglected theory of ergotropic-trophotropic processing. But before we do so, we will return to the discussion of the sensorium and the fields of dots for an operational definition of psychic energy, and we will review the literature on the psychophysiology of meditation. We will then be in a better position to account for some of the structural invariants that seem to occur in the development of higher phases of consciousness.

PSYCHIC ENERGY

Mystical traditions from many cultures describe extraordinary experiences that involve a sense of movement of energy within the body.

These experiences are typically profound, are the consequence of entering an alternative phase of consciousness, and are coded as both numinous and sacred. We wish to operationalize the concept of psychic energy so that cross-cultural comparison of such experiences is possible. We will describe the basic structure of psychic energy experiences, with examples. We will then look at the scientific literature on meditation and suggest a tentative neurocognitive model to account for the structural invariants in those experiences. There are, however, two basic issues relative to the language and scope of description that need clarification before we move directly to that objective.

THE LANGUAGE OF DESCRIPTION. The Indian Vedantic and tantric traditions provide perhaps the most colorful, thorough, and sophisticated description of psychic energy phenomena available in literature. The temptation is great, therefore, to use the Sanskrit terminology elevated to the status of scientific concept for cross-cultural comparison. After all, it is a time-honored tradition in anthropology to borrow native terms for phenomena where English terms are not available (e.g., *shaman*, *mana*, *taboo*, etc.).

However tempting this course may at first appear, it would be as fatuous, as it would be logically fallacious, to borrow a set of terms without including some of the culturally specific Vedantic theory, which gives the terms their common meaning. It is one thing to borrow the odd term from a native tradition, and quite another to lift an entire system of terminology, especially one enjoying the popularity of Hindu philosophy. Furthermore, we could end up in the ludicrous position of making sense of, say, Christian mystical experience using Hindu insights and interpretations, whereas it may well turn out that Christian experiences are conditioned by distinctly Christian interpretations. In any case, we would have failed to meet our original goal, namely, to construct a framework for cross-cultural comparison and scientific theory construction. Professor R.S. Perinbanayagam, in his book *The Karmic Theater*, has noted the same problem with using Hindu terminology to account scientifically for Indian social institutions:

> The somewhat romantic claim that Indian civilization should be investigated with its own epistemological categories—the so-called monism of Indian thoughtways—seems to me rather self-defeating. It may lead to a properly Vedantic sociology but hardly a scientific or comparative one. Indeed, such a method will produce only data, demanding further probing and comparative evaluation and analysis. (Perinbanayagam 1982, 10)

Every attempt will be made, therefore, to develop a set of

descriptive terms consonant with the views already developed in this book. Furthermore, in keeping with the stated aims of biogenetic structuralism (see Laughlin et al., ch. 1) the terminology we elect to use here will allow both an empirical description of direct transpersonal experiences and an account of those experiences based upon sociocultural and biopsychological findings.

EMPIRICAL VERSUS THEORETICAL CONCEPTS. Concepts of psychic energy are rife in the theories of Western philosophy, physical science, and psychology. But the scope of concern in this study is with empirical, rather than with theoretical notions. We are interested in abstracting the invariant qualities of a range of experiences and giving them cross-culturally useful labels. To be sure, theories may be built upon those terms, and we will use them here to further a biogenetic structural theory of consciousness. But we wish to make clear at the outset that the invariant qualities being labeled are intended as *empirical generalizations grounded in direct experience* (like "respiration," "red," "straight," etc.), and not as theoretical entities (like "id," "wave function," "photon," etc.). As empirical generations they are open to both experimental replication within an appropriate transpersonal frame and theoretical explanation within a scientific frame.

PSYCHIC ENERGY. The word *energy* derives from the Greek word *energeia*, which means "activity," the concatenation of the two roots *en*, "in," plus *ergon*, "work" or "action." And, of course, the word *psychic* comes from the Greek *psyche*, which means soul or mind, and which also carries the connotations of life principle or "breath." Thus the term *psychic energy* connotes the activity of, or within, consciousness, mind, or soul. Operationalizing the term within the present framework, we may say that *psychic energy refers to the experience of the activity of dots within the sensorium.* The direct perception of psychic energy is the perception of the movement, unfoldment, transformation, or flow of dots and patterns of dots in consciousness, whether the existence of dots *per se* is recognized by the perceiver.

It is presumed in this definition that the activity of a field of dots is a pan-human universal. It is universal because the physiological structure of the sensoria of all humans is the same. As a pan-human universal, the activity of fields of dots composing the experiential component of the cognized environment will produce a recognizable pattern of invariance in the reports of introspection cross-culturally. As we have noted, this presumption amounts to a strong, biologically grounded form of W. T. Stace's (1960, 29) *principle of causal indifference.*

This requires that methods of cross-cultural comparison must also be sensitive to the invariance embedded in the seemingly variant, culture specific, traditional modes of symbolic expression. In short, there is the immediate perception of sensorial events, and there is the interpretation of them vis à vis traditional symbolism and cosmological understanding (Stace 1960, 31).

Psychic Energy and Higher Phases of Consciousness

Although psychic energy as defined here is apparent to disciplined introspection at any time, we are interested primarily in certain regularities in the experiences of psychic energy while practitioners are in extraordinary phases of consciousness. By the phrase *higher* phases of consciousness, we imply a developmental (or maturational) aspect to the neural entrainments mediating certain experiences and knowledge (see Maslow 1968, 1971; Wilber 1980; Boucouvalas 1980). Phases of consciousness, even extraordinary ones, are produced by discrete patterns of entrainment of neural networks and are thus open to diachronic, developmental processes, as well as synchronic structural ones. We are less interested in extraordinary experiences that may occur as a consequence of a chance and novel entrainment, and are more interested in the experience and knowledge that arises as a consequence of *advanced development* of patterns of entrainment. This advanced development is rare in human cultures and inevitably requires the conscious participation of the individual in his or her own development—what C. G. Jung might have considered advanced individuation.

The following are, we believe, some cross-cultural invariant features of the higher experience of psychic energy.

FLOW. The experience of greater flow of energy in the body/sensorium is an inevitable consequence of sustained and intense concentration on a physical activity such as racing, dancing, swimming, and the like, or on some object of contemplation.

> Flow is the holistic sensation present when we act with total involvement, a state in which action follows action according to an internal logic, with no apparent need for conscious intervention on our part. Flow is experienced in play and sport, in artistic performance and religious ritual. There is no dualism in flow. . . . Flow is made possible by a centering of attention on a limited stimulus field, by means of bracketing, framing, and often a set of rules. There is a loss of ego, the self becomes irrelevant. Flow is an inner state so enjoyable that people sometimes forsake a comfortable life for its sake. (Turner 1979, 154)

Flow (see Csikszentmihalyi 1975) is an experience that may be associated with the unfettered release of all bodily and mental tension. Total flow experience is the experiential polarity of total, "up-tight" distress. Depending upon how blocked the energy resources are under stress conditions, flow may or may not involve the experience of a marked release or upsurge of energy, which may be interpreted at the time as "floating," "bliss," "rapture," "ecstasy," or "exhilaration." Full flow will be characterized by the cessation of internal verbal chatter and fantasy. Consciousness is notably clear of worry, defensiveness, and ego-centeredness. Entering flow is commonly reported to be like "breaking through" to another plane of consciousness, as "attaining one's second wind," and as if the "bottom had fallen out from under" the normal limits of consciousness. During the experience of uninhibited flow, there is a sense of access to an endless source of energy, and the awareness of bodily movement as smooth, effortless, and blissful (Csikszentmihalyi 1975).

CENTEREDNESS. A more refined, and presumably more advanced, form of flow involves the movement of energy toward (or into) or away from (or out of) the central axis of the body.[2] The centering of bodily energy in a vertical axis may be experienced directly as bodily (i.e., proprioceptive) sensations and symbolically in visual imagery. One of the authors (CDL) had a relevant experience while participating in Maulavi (Sufi dancing) in which the activity was to spin around to music while visualizing a central crystal-form axis running up the center of his body and colorful streams of energy flowing out of his palms. There came a point in the dance when concentration intensified and consciousness shifted—the energy centering in that axis and the entire world of phenomena appeared to be spinning around the center of consciousness, which was the axis. This experience was associated with intense and blissful energy stirring in the axis. A moment later the absorption was broken by thoughts about the experience, and the author immediately fell down.

Individuals having a central axis experience may see in a vision the movement of energy in a central tube or shaft, the trunk of a tree, a waterfall, or the like. The symbolic variations are endless, and undoubtedly are related to the *axis mundi* motif in cosmological myth (Eliade 1964).

CIRCULATION. Centered psychic energy is often experienced as circulating around the body axis, and often concentrated at one or more points along the axis. The classic example of circulating, concentrated energy, is the *chakra*, a Hindu term that literally means

"wheel" (Kakar 1982, 201; see also discussion below). Again, a discrete center of psychic energy may be experienced somaesthetically as a concentration of heat, bliss, or movement at a particular locus, and symbolically as a scintillating bubble or sphere; a rotating wheel, ball of fire, "space station," lotus or other flower; rings around a planetlike sphere; or some other image. References to "circulation of light" within the body and the cosmos to be found in an ancient Chinese meditation text, *The Secret of the Golden Flower* (Wilhelm 1962), provide one example of such experiences.

Circulation of energy may be experienced as moving centrifugally away from the center, or centripetally toward the center (Woodroffe 1974, 7). The center may feel like a spot of intensely hot and blissful energy radiating outward from the body and into the world. One may perceive a radiant "sun," "moon," or other astrological body emitting rays of light outward into the world. On the other hand, one may feel energy moving inward, concentrating upon a particular spot in the body. One may see the image of an inwardly spiraling vortex of light, perhaps condensing at a particular spot.

ASCENDING AND DESCENDING. It is not uncommon for a report of centeredness to emphasize the ascending or descending direction of energy flow. Energy may be experienced as originating from below (the nadir) and moving up the body axis, originating above (the zenith) and moving down the axis, or both. Once again, the experience may be a somaesthetical flow of energy from above or below, producing bliss or ecstasy in the body. One may feel like a virtual conduit or hollow shell through which all imaginable energy is flowing from someplace unseen to someplace unseen. The experience may also have a visual component such as radiant light from a source above or below (see Eliade 1965; Bucke 1961 for various descriptions), a waterfall down the central visual field, a shaft of light, a tube of flowing particles, movement of a mist or cloud of energy, or vertical movement of consciousness. Movement of energy up and down the central axis is frequently associated with emotional outbursts and the spontaneous release of tension, the latter called "dearmoring" by Reichian psychologist Alexander Lowen (1976).

Of notable significance seems to be the interaction of polarized energy sources, especially those associated with above and below, left and right. The highest phases of consciousness and the most profound illumination or insight are frequently associated with the linking of these polarities by axes of energy flow. In some cases, establishing a free flow of energy between an energy center above (e.g., in or above the head) and one below (e.g., the belly,

genital-anal area, or somewhere below the spine) is requisite for a phase of consciousness during which profound and numinous experiences are attained. This phase, commonly described in terms of a "clarification," or an "expansion," of consciousness, is one in which superior power, illumination, and transcendent insight and vision are attainable. It is in this phase of consciousness, often described in the ethnographic literature as "trance," "ecstasy," or "altered state," that a shaman may experience a journey into the ethereal or chthonian realms of cosmological reality. The journey to one or another of these cosmic realms is a common motif both in mythopoeic texts and dramas and in dream reports.

DREAMBODY. The flow of psychic energy in the body, revealed in various phases of consciousness as somaesthetic sensations and symbolically as visual forms, may be interpreted in some cultures as a *dreambody* (after Mindell 1982). The dreambody (i.e., "soul," "subtle body," "energy body," etc.) is the conceived or imagined "real" body of perceived energy flow within the sensorium. The perception of energy flow within the body is, of course, dependent upon the phase of consciousness being attended. Viewing the body as a concrete, physical "thing" or entity is typical of the phases of consciousness most concerned with adaptation to the external environment. But this perception, like all perceptions, is a construct combining somaesthetic, visual, and tactile inputs with conceptual and imaginal components to form a basic *body image*. Views of the body in other phases (e.g., dream, lucid dream, meditation, hallucinatory drug experience, etc.) tend to drop the dominant body image and to be more evanescent in substance and plastic in form. The dreambody is perhaps capable of extraordinary deeds, able to metamorphose or vanish at will, and free to travel to other worlds.

Examples of Higher Psychic Energy Experiences

There are numerous examples of higher psychic energy experiences in the literature (see e.g., Bucke 1961). It might be useful to describe three of the more dramatic reports available.

BUSHMEN !KIA AND N/UM. A clear example of higher psychic energy experiences from the ethnographic literature, and one that incorporates some of the structural motifs just noted, is that found among the Kalahari Bushmen. Richard Katz (1976, 1982) describes for the Bushmen a "transcendental experience" called *!Kia*, an extraordinary state of consciousness during which

a !Kung experiences himself as existing beyond his ordinary level of existence. !Kia itself is a very intense physical and emotional state. The body is straining against fatigue and struggling with convulsion-like tremors and heavy breathing. The emotions are aroused to an extraordinary level, whether they be fear or exhilaration or fervor. Also, a !Kung practices extraordinary activities during !Kia. He performs cures, handles and walks on fire, claims x-ray vision, and at times says he sees over great distances. He does not even attempt such activities in his ordinary state. (Katz 1976, 287)

The *!Kia* mindstate is attained through the mastery of *n/um*, an "energy" which, the Bushmen say, dwells in the pit of the stomach. Individuals are known to master this energy, which may be evoked by repetitious dancing.

As the master of n/um continues his energetic dance, becoming warm and sweating profusely, the n/um heats up and becomes a vapor. It then rises up the spine, to a point approximately at the base of the skull, at which time !Kia results. (Katz 1976, 286)

According to one of Katz's informant adepts:

You dance, dance, dance, dance. The n/um lifts you in your belly and lifts you in your back, and then you start to shiver. N/um makes you tremble; it's hot. Your eyes are open but you don't look around; you hold your eyes still and look straight ahead. But when you get into !Kia, you're looking around because you see everything, because you see what's troubling everybody. . . . Rapid shallow breathing, that's what draws n/um . . . then n/um enters every part of your body, right to the tip of your feet and even your hair. . . . in your backbone you feel a pointed something, and it works its way up. Then the base of your spine is tingling, tingling, tingling, tingling, tingling, tingling, tingling . . . and then it makes your thoughts nothing in your head. (Katz 1976, 286–87)

The motifs apparent in these descriptions are strikingly similar to those found in other cultures. An energy source from below is tapped by some spiritual exercise (in this case dancing and intense concentration). Energy, whose movement is associated with heat, emotion, release of tension, and bliss, rises up a central axis to a center above, and a higher phase of consciousness, *!Kia*, is attained. Thoughts are transcended and extraordinary powers are experienced.

HINDU KUNDALINI. A similar phenomenon has been described for ages among Indian Hindu yogis who recognize the existence of a primal, infinite source of psychic energy called *kundalini*, which is considered to be the font of all religious states of consciousness:

Thus the rousing of the Kundalini is the one and only way to the attaining of divine wisdom, super-conscious perception, realization of the Spirit. The rousing may come in various ways: through love for God, through the mercy of perfected sages, or through the power of the analytical will of the philosopher. Wherever there has been any manifestation of what is ordinarily called

supernatural power or wisdom, there a little current of the Kundalini must have found its way into the Sushumna [central axis]. (Vivekananda 1956, 58)

The goal of yogic practice is to open the central channel, which runs up the center of the body just in front of the spine, of the psychic energy body to the *kundalini* energy. "When the current begins to rise through the Sushumna, we go beyond the senses, and our minds become supersensuous, superconscious, we go beyond even the intellect, where reason cannot reach" (ibid., 63). There exist several major energy centers ranging along the central axis, but the most important are the *kundalini* centers at the base of the spine, at the heart, and the crown of the head. "All the energy has to be taken up from its seat in the *Muladhara* [basal center] and brought to the *Sahasrara* [head center]" (ibid.). To this end yogis practice a number of techniques involving rhythmic breathing and physical exercise to loosen and direct the *kundalini* energies.

It should be emphasized that the tantric view of the structure of the energy body is based, not upon metaphysical speculation or theological revelation, but upon direct, empirical observation of psychic energy events in the body during yogic practice. The symptoms of *kundalini* activity are complex and varied. For example, Dhyananyogi Madhusudandas has described many symptoms related to the activity of the *kundalini:*

. . . creeping sensations in the spinal cord, tingling sensations all over the body, heaviness in the head or sometimes giddiness; automatic and involuntary laughing or crying; hearing unusual noises, seeing visions of deities or saints. Dream scenes of all kinds may appear from the heavenly to demonic. Physically the abdomen wall may become flat and be drawn towards the spine; there may be diarrhea or constipation, the anus contracts and may be drawn up, the chin may press down against the neck. (Mookerjee 1982, 71)

Not everyone will experience the same symptoms, but from a constelation of many of those symptoms one may know that their *kundalini* is active. Pandit Gopi Krishna experienced a particularly dramatic and spontaneous eruption of *kundalini* energy:

One morning . . . I sat cross-legged in a small room. . . . I was meditating with my face towards the window on the east through which the first grey streaks of the slowly brightening dawn fell into the room. Long practice has accustomed me to sit in the same posture for hours at a time without the least discomfort, and I sat breathing slowly and rhythmically, my attention drawn towards the crown of my head, contemplating an imaginary lotus in full bloom, radiating light. . . . The intensity of concentration interrupted my breathing; gradually it slowed down to such an extent that at times it was barely perceptible. My whole being was so engrossed in the contemplation of the lotus that for several minutes at a time I lost touch with my body and surroundings. During such intervals I used to feel as if I were poised in mid-air, without any feeling of a body around

me. . . . During one such spell of intense concentration I suddenly felt a strange sensation below the base of my spine, at the place touching the seat. . . .
. . . suddenly, with a roar like that of a waterfall, I felt a stream of liquid light entering my brain through the spinal cord. . . . the illumination grew brighter and brighter, the roaring louder, I experienced a rocking sensation and then felt myself slipping out of my body, entirely enveloped in a halo of light. . . . I felt the point of consciousness that was myself growing wider, surrounded by waves of light. It grew wider and wider, spreading outward while the body, normally the immediate object of its perception, appeared to have receded into the distance until I became entirely unconscious of it. I was now all consciousness, without any outline, without any idea of a corporeal appendage, without any feeling or sensation coming from the senses, immersed in a sea of light simultaneously conscious and aware of every point, spread out, as it were, in all directions without any barrier or material obstruction. I was no longer myself, or to be more accurate, no longer as I knew myself to be, a small point of awareness confined in a body, but instead was a vast circle of consciousness in which the body was but a point, bathed in light and in a state of exaltation and happiness impossible to describe. (Krishna 1971, 11–13)

Pandit Krishna had many painful symptoms arise during the weeks and months following this extraordinary experience. For example, the "heat grew every moment causing such unbearable pain that I writhed and twisted from side to side. . . . But the heat increased and soon it seemed as if innumerable red hot pins were coursing through my body, scorching and blistering the organs and tissues" (Krishna 1971, 13). Itzhak Bentov in working with *kundalini* experiences of Western meditators described similar symptoms reported by his subjects. He termed the collection of symptoms the "sensory motor cortex syndrome":

. . . a transient paresthesia of the toes or ankle, with numbness and tingling. Occasionally, there is diminished sensitivity to touch or pain, or even partial paralysis of the foot or leg. The process most frequently begins on the left side and ascends in a sequential manner from foot, leg, hip, to involve completely the left side of the body, including face. Once the hip is involved, it is not uncommon to experience an intermittent throbbing of rhythmic rumbling-like sensation in the lower lumbar and sacral spine. This is followed by an ascending sensation which rises along the spine to the cervical and occipital regions of the head. (Bentov 1977, 34)

The list of weird and exotic symptoms associated with the awakening of *kundalini* is almost endless. Completing this process may take as little as three days, as in the case of Sri Ramakrishna, or months as in Pandit Gopi Krishna's case, or even years.

CHRISTIAN SACRED HEART. Reports of higher psychic energy experiences come to us from several sources within the Christian mystical traditions. There is no better source for our purposes

than that of the Sacred Heart tradition that began in the twelfth century (see Laughlin, Chetelat, and Sekar 1985). A number of saints reported significant visions pertaining to the Sacred Heart of Jesus; predominant among them was Margaret Mary Alacoque (1647–90). She had four profound visions over the course of her life, experiences which directly resulted in full development of the symbol of the Sacred Heart, and in the consecration of the Sacred Heart devotion as a rite within Roman Catholicism.

Margaret Mary described her first vision in her autobiography. Tickell, writing in the nineteenth century, quotes from her work in describing that experience:

> The following, as it seems to me, is the way in which the thing occurred. Jesus said to me, "My Divine Heart is so full of love for men, and for you in particular, that being unable to contain within Itself the flames of Its burning charity, It must needs spread them abroad by your means, and manifest Itself to them to enrich them with the treasures It contains. I discover to you the price of these treasures; they contain graces of sanctification and salvation necessary draw them from the abyss of perdition. I have chosen you, in spite of your unworthiness and ignorance, for the accomplishment of this great design, in order that it may better appear that all is done by Me."
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> After these words, our Lord asked her [Margaret Mary] for her heart. She begged of Him to take it. This He did, and placed it in His own Adorable Heart, where He showed it to her *as a little atom which was being consumed in this burning flame in form of a heart.* He restored it to the place from whence He had taken it, saying to her "See, My well-beloved, I give you a precious pledge of My love. I have enclosed within your side a little spark of the vivid flames of that love to serve you for a heart, and to consume you to the last moment of your life. Its ardour will never be extinguished, and you will be unable to find any relief from it, except some slight relief by bleeding. And even this remedy will bring you more humiliation and suffering than relief. . . . You have taken, hitherto, only the name of My slave, I give you from this time that of the beloved Disciple of My Sacred Heart." (Tickell 1869, 128–29; *emphasis ours*)

After this vision Margaret Mary suffered from searing pains in the chosen side on the first Friday of every month. She received her second vision the following year:

> One day . . . on the Feast of St. John the Evangelist 1674, after having received from my Divine Savior a favour almost similar to that bestowed upon the beloved Disciple on the evening of the Last Supper, the Divine Heart was represented to me *as on a throne of fire and flames, shedding rays on every side brighter than the sun and transparent as crystal.* The Wound which He received upon the Cross appeared there visibly; a crown of thorns encircled the Divine Heart and It was surmounted by a Cross . . . He gave me to understand afterwards that it was the great desire He had to be perfectly loved by men that had made Him form the design of disclosing to them His Heart, and of giving them . . . this last effort of His love by proposing to them an object and a means so calculated to engage them to love Him. (Tickell 1869, 141–42; *emphasis ours*)

The third vision appeared the same year. Jesus presented himself to Margaret Mary "all resplendent with glory, his five wounds shining like so many suns" (Stierli 1957, 117), and ordered her to carry out a number of ritual acts. In her last vision, Christ requested the liturgical celebration of the mystery of the Sacred Heart. The period following the last vision was filled with pain, physical illness, and humiliation at the hands of other sisters in the Order.

These examples illustrate the profound alterations that may occur to both consciousness and physiology as a consequence of intensively practicing one or another spiritual discipline. It would therefore seem reasonable to review the scientific literature on the psychophysiology of meditation in order to glean whatever clues we may find to the structural principles upon which these experiences are based.

THE PSYCHOPHYSIOLOGY OF MEDITATION

Great interest in meditation has developed in Western science over the past generation. One would expect a concomitant rise in interest among scientists as well (see Murphy and Donovan 1983). And indeed, there has been a flurry of research on the topic, but the scientific literature on the physiology of meditation is, unfortunately, incomplete at best, and downright impertinent at worst. The apparent lack of experience in meditation of many researchers and the unavailability of a technology appropriate to complete inquiry about meditation result in inadequate information (Shapiro 1983). Research is frequently impertinent when it fails to address the naturalistic circumstances of meditation within traditional cultural contexts. The literature is spotty, for example, when it fails, as it usually does, to distinguish clearly between the great variety of practices available cross-culturally, often generalizing from a single tradition (usually Transcendental Meditation, or TM) to all meditation traditions. For example, research often fails to note that many meditation traditions intentionally set the stage for extraordinary transpersonal experiences—conditions and experiences that almost never occur under laboratory conditions and are thus almost impossible to replicate within the unrealistic strictures imposed by current scientific paradigms. It is also impertinent when it refuses to consider lengthy retreat work often presupposed by paths of advanced spiritual development.

GLOBAL RELAXATION VERSUS MULTIPROCESS MODEL.

However, many of the more extreme shortcomings of scientific research on the physiological and psychological effects of meditation

are being corrected, albeit slowly, and there is some information available relevant to our topic. By "meditation" we refer to any number of techniques for the formal practice of concentration and awareness. Several useful reviews of the literature have been published over the past decade and a half (Pagano and Warrenburg 1983; Schuman 1980; Davidson 1976; Woolfolk 1975; Shapiro 1980; Holmes 1984). One problem in dispute is whether meditation produces a "unique hypometabolic state" in practitioners as claimed by Wallace and colleagues (1971). That is, does the practice of meditation—usually "passive" types of meditation like TM—produce a distinct pattern of somatic relaxation not also produced by simple relaxation or an alternative relaxation technique such as progressive relaxation? Some of the more elaborate claims along this line have proved to be unfounded, or at least have failed to be replicated (see Holmes 1984). Quoting Pagano and Warrenburg:

> We regret to report that our search for a unique or dramatic effect directly attributable to meditation thus far has not been successful. In this area many practitioners have made sweeping claims about the effectiveness of their techniques. Frequently, this is based on subjective experience, and often the claims are "shored up" on the basis of "research." All too often, this research turns out to be not very rigorous—really only of pilot nature. This has been especially true within the TM movement. Our experience has been that when good scientific methodology has been used, the claims made have been extravagant and premature. (1983, 203)

Comparable relaxation effects have been demonstrated for other techniques (Steptoe 1978; Pagano and Warrenburg 1983). Some authorities have argued from these reports that individuals are capable of a base level of relaxation (a "floor effect"; Pagano and Warrenburg 1983, 165) attainable through a variety of means: "passive" meditation, normal relaxation, progressive relaxation, biofeedback, autogenic training, and exercise. Some researchers have reasoned, therefore, that each of these techniques taps (drives) a singular, generalized "relaxation response" (Benson, Beary, and Carol 1974; Hoffman et al. 1981; Holmes 1984).

Other researchers continue to find distinct physiological differences when comparing meditators to controls along such dimensions as respiration (Wolkove et al. 1984), decreased oxygen consumption, and relative increase of cerebral blood flow (Jevning et al. 1978, 1982). Still other researchers have pointed to the distinctiveness of effects of different techniques used in different situations. They argue that decreased arousal is not a singular process, but rather a complex of processes that may be organized in different ways under different circumstances (Davidson 1976; Davidson and Schwartz 1976).

Personality factors may well have an influence on patterns of meditation. For example, Pagano and Warrenburg (1983, 204) reported evidence suggesting predispositional factors may determine the success of a particular technique. They showed that subjects already measurably high in the capacity for absorbed attention tended to persist with meditation (see Davidson, Goleman, and Schwartz 1976). In other research, Schwartz, Davidson, and Goleman (1978), distinguishing between cognitive and somatic components of anxiety, compared the effects of physical exercise and meditation upon reports of anxiety. They found that meditators report less cognitive and more physical anxiety, whereas exercisers report less physical and more cognitive anxiety.

Several studies have indicated that the presence or absence of stressful conditions is corrolated with differential somatic reactions by practitioners of various relaxation techniques: Whereas their responses under optimal conditions seem much the same (thus seeming to support the singular relaxation response model), their responses under various stressful conditions may diverge significantly (thus supporting a multiprocess model, see Pagano and Warrenburg 1983, 165; Steptoe 1978; Leyrer 1978; Stroebel and Glueck 1978; Schwartz, Davidson, and Goleman 1978; Davidson and Schwartz 1976).

EXCITATION VERSUS RELAXATION. Most meditation research has been carried out upon "passive" meditation techniques such as TM and Zen. The trend in the literature is to demonstrate the calming effects of those techniques. In sharp contrast to those findings are those from research on various yogic techniques such as Ananda Marga (a form of Hindu tantric yoga; see Elson, Hauri, and Cunis 1977; Corby et al. 1978; Elson 1979), which show some *elevation* of excitation rather than simple relaxation (see Woolfolk 1975 for a review of the literature). Corby and colleagues (1978) found that the more advanced the meditator, the more actively alert he was during meditation as indicated by measures of skin conductance, frequency of GSR (galvanic skin response) responses, heart rate, and EEG sleep scoring. This finding contrasts with some research on "passive" meditation using EEG scoring measures that indicates that "passive" meditators, at least inexperienced ones, often spend some time asleep while meditating (Pagano and Warrenburg 1983, 156). Corby's results are in keeping with other studies of active Indian yogic techniques (Das and Gastaut 1955; Wenger and Bagchi 1961; Anand, China, and Singh 1961; however, see Elson et al. 1977 for conflicting results). Their subjects reported experiences

associated with "good to excellent" meditation sessions that are in keeping with somatic and sensorial arousal:

> "I experienced many feelings of energy rushes, as if energy were pouring into my body: more and more as my breathing deepened and slowed," ". . . chills, laughter, changing and varied emotions: early life flashes," ". . . total energy and absorption gradually coming down, concentration with an intense yearning to be one with the object of ideation," ". . . feelings of rushes of energy, pouring over my body," and ". . . becoming mantra, not doing it but being it. A great sense of merger and understanding of experience and its meaning." (Corby 1979, 606)

It should also be noted that little scientific research exists to date on the psychophysiology of meditation systems that use visualization or imaging extensively, such as the Tibetan tantric (Chang 1963) and Japanese Shingon (Kiyota 1978) forms of Buddhism. There exists some evidence that both the process and the content of imaging can influence activities of the autonomic nervous system (see di Giusto and Bond 1979, Qualls and Sheehan 1981 for reviews of the literature). We may reasonably expect that certain imagery may operate to increase and other imagery to decrease autonomic arousal.

ATTENTION, ABSORPTION, AND THETA ACTIVITY. Potentially the most important finding in meditation research is ironically one of the least understood. We refer to the observation of increased production of low- to high-amplitude, low-frequency theta activity recorded by EEG from meditators (Zen, TM, Ananda Marga) and practitioners of other relaxation techniques (autogenic training; see Schacter 1977; Woolfolk 1975; Pagano and Warrenburg 1983, 171–72 for numerous citations). Elson and colleagues (1977) and Corby and colleagues (1978) found that yogic ("active") meditators produced more theta power than nonmeditators, and that more proficient meditators produce more theta than less proficient meditators. Kasematsu and Hirai (1966, see also Hirai 1974) found that Zen meditators showed continuous theta production, even when eyes were open, after the end of the meditation session. Interestingly, an analysis of resonance frequencies of a sample of mantras gave values of 6 to 7 Hz, which is within the theta range (reported in Stroebel and Glueck 1978, 420).

Whereas most meditation researchers seem reluctant to attribute psychological correlates to theta activity, some evidence exists that sustained low-amplitude theta is correlated with sustained attention or vigilance (Pigeau 1985; Ishihara and Yoshii 1972; Schacter 1977). High-amplitude theta bursts may well be correlated with the brief, intense absorption (hyperintentional) states common to more

proficient meditators. Heightened vigilance leading to absorption (see Tellegan and Atkinson 1974) would seem to be an individual "special trait" (Pagano and Warrenburg 1983, 188), already functioning in persons likely to become long-term meditators (see Qualls and Sheehan 1981). Smith (1978) reported that subjects benefiting the most in terms of anxiety reduction from TM meditation tended to score highly on a section of a personality test that relates specifically to the capacity for absorption.

PEAK EXPERIENCES. Psychophysiological research pertaining to peak experiences in meditation is understandably rare. Corby and others were fortunate enough to record some measures during a period when a yogi experienced a brief near-absorption state:

> One expert meditator reported the experience of "having my breathing taken over by the *mantra*" during the meditation condition, and felt it might represent what she termed a "near-*Samadhi*" experience. The concurrent respiratory record . . . showed a pattern of respiratory acceleration with little change in respiratory amplitude followed by cessation of respiration for approximately 100 seconds. . . . A dramatic decrease in skin resistance of approximately 200 kohms preceded the respiratory acceleration.
>
> Visual inspection of the meditation EEG record of this subject disclosed large amounts of high amplitude (up to 100 μV) alpha range frequencies and also large amounts of theta range frequencies (up to 150 μV). Occasionally there were discrete bursts of theta range frequencies of amplitudes up to 300 μV. No particular EEG changes were associated with the "near-*Samadhi*" event. (1978, 574)

This indication of significant autonomic arousal during peak or "ecstatic" experience is in keeping with previous research on yogic practice (Das and Gastaut 1955; Wenger and Bagchi 1961).

MEDITATION AND HEMISPHERIC ASYMMETRY. The early hypothesis proposed by Ornstein (1972) and others that meditation changes predominant processing from left to right lobe, and thus from linguistic-analytic to imaginal-gestalt modes of cognition, has proved to be unfounded (see Pagano and Warrenburg 1983, 174ff.). Indeed, the prevailing evidence seems to favor the view that "passive" meditation in general leads to a less asymmetrical, more balanced processing of information (Stroebel and Glueck 1978) and that different types of meditation, particularly "active" meditations accompanied, as they always are in traditional settings, by cosmological beliefs and mythopoeic symbolism, may result in different neurocognitive entrainments and thus different experiences (see Davidson 1976, 372 on this point). This combining of cultural elements will involve variant entrainment of left- and right-lobe

functions, depending upon the tradition in which the technique is embedded, and the proficiency and psychological makeup of the individual meditator.

One would not really expect a dramafic shift from left- to right-lobe processing for the meditation techniques usually researched in laboratories. As any mature contemplative knows, progress along the path of meditation involves the cessation of *both* conceptualzing and imagery. In fact, many techniques encourage disattention to, even active suppression of, both verbal chatter and fantasy. In Zen, for example, the mind is trained to watch without attachment the arising and passing away of whatever enters consciousness (Suzuki 1970). However, in traditions using visualization practices in which concentration is upon an eidetic image, we would expect to find some evidence for a predominance of right- over left-lobe processing, at least in the early stages of meditation.

Relative to cerebral dominance and yoga practice, research by Werntz and colleagues (1982) has shown that the nasal cycle (that is, the shift in nasal dominance during breathing) is directly correlated with activity in the cerebral hemispheres as measured by cortical EEG. As the relations between hemisphere and autonomic system are ipsilateral (same side), rather than contralateral (crossed over), they reason that greater cerebral efficiency is facilitated by greater sympathetic (excitatory) arousal on the ipsilateral side (increasing air flow) and greater parasympathetic (vegitative) arousal on the contralateral side (decreasing air flow). There is evidence that relative dominance of cerebral activity changes cyclically during the day (Broughton 1975), and nasal dominance would seem to correlate to some extent with this cycling. It is interesting to note that yogic traditions recognize the significance of the nasal cycle for balancing the flow of psychic energy in consciousness. For example, Tibetan tantric practice specifically suggests waiting to do certain meditations until the breath is flowing equally through both nostrils (Chang 1963, 63). Yogis will in fact use simple breathing techniques to assure an equal flow. We may suggest that the optimal condition for carrying out some "active" meditations exists when both hemispheres are balanced in their activity.

It should be evident from our very brief survey of the psychophysiology of meditation that the picture is far more complex than some early reports led one to believe. The question is, does there exist a model of neurocognitive activity sufficiently complex to account for the many and varied phenomena being reported in the recent literature?

Tuning the Ergotropic and Trophotropic Systems

Following the pioneering work of W. R. Hess (1925, 1957), E. Gellhorn and his associates (Gellhorn 1967; Gellhorn and Loofbourrow 1963; Gellhorn and Kiely 1972) developed a model of the hierarchical integration of somatic, autonomic, and higher neural systems, which in part accounts for the complex intercausality between activities at every level of processing (see also Lex 1979, Davidson 1976). The somatic system that controls the distribution and utilization of metabolic energy in the body is conceived as being composed of two complementary (sometimes antagonistic) systems. One system is called the *ergotropic system* and the other the *trophotropic system* (Gellhorn 1967; Gellhorn and Loofbourrow 1963).

THE ERGOTROPIC SYSTEM. The ergotropic system subserves our so-called fight-or-flight responses; that is, the physiological components of our adaptation strategies to desirable or noxious stimuli in the world. Anatomically, the ergotropic system incorporates the functions of the sympathetic nervous system (one-half of the autonomic nervous system), certain of the endocrine glands, portions of the reticular activating system in the brain stem, the posterior hypothalamus, and portions of the limbic system, and the frontal cortex. The principal function of the ergotropic system is the control of short-range, moment-by-moment adaptation to events in the world. It is activated when the possibility of responding to stimuli arises and is constructed to shunt the body's metabolic energy away from long-range developmental activities, and to initiate and carry out action directed either at acquiring or avoiding stimuli of interest to the organism.

Under generalized ergotropic arousal, many organic responses may be experienced, including shivering, constriction of the surface veins and capillaries (paling of the skin), dilated pupils, increased heart rate and blood pressure, increased muscle tension, decreased salivation ("dry-mouthed"), constriction of the throat, increased rate of respiration, erection of body hair ("hair standing on end"), and desynchronization of cortical EEG patterns (indicating discordant or disharmonic cortical functioning). These responses, all subserving adaptation in one way or another, are commonly associated in experience with positive or negative emotion. Objects or events associated with responses will typically be perceived as desirable or undesirable, attractive or repulsive, friendly or hostile, beautiful or ugly. The ergotropic system prepares the organism to obtain objects (like food, water, or a mate) required for the continued survival of

the organism or species, and to avoid objects (like poisons, enemies, and predators) dangerous to survival. A fundamental problem in nature is how to eat without being eaten. The ergotropic system in humans is the product of millions of years of selection for responses that solve that problem. It is the ergotropic system that mediates stress relative to events in the world (Selye 1956).

THE TROPHOTROPIC SYSTEM. The trophotropic system is far less dramatic in its activities but is nonetheless the system responsible for regulating all the vegetative functions, such as reconstruction and growth of cells, digestion, relaxation, sleep, and so on. Anatomically, the trophotropic system incorporates the functions of the parasympathetic system, various endocrine glands, portions of the reticular activating system, the anterior hypothalamus, and portions of the limbic system and frontal cortex. The trophotropic system controls the somatic functions responsible for the long-term well-being, growth, and longevity of the organism. This system operates to maintain the optimal internal balance of bodily functions for continued health and development, both of the body and consequently of the mind.

Under the influence of the trophotropic system, a variety of physical and mental responses may be experienced, like warmth and "blushing" at the surface of the body due to release of sympathetic constriction of veins and capillaries, constriction of the pupil of the eye, decreased heart rate and blood pressure, relaxation of tension in the muscles, increased salivation, relaxation of the throat, slowing and deepening of respiration, erection of the penis and clitoris, and synchronization of cortical EEG patterns (indicating harmonized higher cortical functions). Relaxation (reduced arousal) and its concomitants are commonly associated either with disinterest in the environment, or with dispassionate concentration upon some object (Jacobson 1938; Benson et al. 1974). Judgments about the desirability or undesirability of the object are suspended. The relaxed person is typically experiencing a comfortable, warm, womblike indifference to the environment. The fundamental function of relaxation is perhaps less obvious than that of ergotropic arousal, but is nonetheless crucial to the survival of the organism. It is mainly during relaxation, and particularly during undisturbed sleep, that the body processes nutrients and uses these to repair and grow. In other words, when the body is not finding food and avoiding becoming food (ergotropic reactivity), it is reconstructing and developing itself (trophotropic reactivity).

COMPLEMENTARITY. The ergotropic and trophotropic systems have often been described as "antagonistic" to each other—the increased activity of the one tends to produce a decreased activity in the other. Each system is physically designed to inhibit the functioning of the other under most circumstances. If a person gets excited about something (angry, anxious, afraid, strongly desirous, etc.) the ergotropic system not only produces the requisite physiological, emotional, and behavioral responses, it also suppresses (via reciprocal inhibition pathways) the trophotropic system, which was previously subserving digestion and other conservative metabolic activities. Likewise, when a person relaxes (say, after a heavy meal), the trophotropic system actively suppresses the activity of the ergotropic system. A summary of the reciprocal functions of the two systems may be studied in table 1.

TABLE 1

A Summary of Some Functions of the Trophotropic and Ergotropic Systems

Trophotropic System	*Ergotropic System*
Storage of vital resources	Expenditure of vital resources
Digestion and distribution of nutriments	Digestion stopped
Bronchi leading to lungs constricted and coated with mucus	Bronchi opened
Heart rate and blood pressure reduced	Heart rate and blood pressure increased
Collection of waste by-products	Endocrine system releases chemicals that increase efficiency of muscles
Constricts pupils	Dilates pupils
None	Erection of body hair
Synchronized EEG	Desychronized EEG
Erection of penis	Ejaculation
Increased salivation	Decreased salivation
Respiration slower and deeper	Respiration faster and shallower

The relationship between the two systems would be better described as complementary, rather than antagonistic, for each serves the short- and long-range well-being of the organism. It is really a matter of balance of functions, the trophotropic system maintaining the homeostatic balance necessary for health and growth while the ergotropic system facilitates the moment-to-moment adaptation of the organism to its environment. As such, they are not anatomical mirror images of each other. The "wiring" of the ergotropic system is designed to arouse the entire body for potential response to threat. Under normal conditions, when the ergotropic

system is activated, the entire body/mind becomes aroused. By comparison, the trophotropic system is "wired" for the fine tuning of organs in relation to each other as the demands of internal maintenance shift and change. Its resources can be activated for one organ or body part, or it can turn on globally as during sleep when the entire skeletal musculature is "turned off."

The point to emphasize is that whereas the trophotropic system is designed for continuous activity, the ergotropic system is designed for occasional activity. We are "wired" for short, infrequent bursts of adaptive activity interspersed with relatively long durations of rest, recuperation, and growth. Prolonged ergotropic reactivity may cause depletion of vital resources stored by the trophotropic system in various organs, and may cause fatigue, shock, body damage, and in extreme cases, death (Selye 1956; Antonovsky 1979).

TUNING. The particular balance of ergotropic and trophotropic activities under particular environmental circumstances is susceptible to conditioning (Thomas 1968; Hofer 1974; L.E. Roberts in Schwartz and Shapiro 1978), and there is evidence that their characteristic balance under stress is established as early as pre- and perinatal life (Grof 1976; Richmond and Lustman 1955; Wenger 1941; Thomas 1968; Chamberlain 1983; Verny 1982). The learned (conditioned) ergotropic-trophotropic balance relative to any stimulus is called *tuning* (Gellhorn 1967, 110ff.). When we say that someone "gets up-tight around authority figures," we are referring to a discrete ergotropic-trophotropic tuning relative to people perceived to be in authority. Or when we say that someone "calmed-out when he got a back-rub," we are referring to a different discrete tuning relative to being stroked.

As we have noted, a change in the characteristic ergotropic-trophotropic balance relative to a stimulus is called *retuning* (Gellhorn 1967; see also Miller 1969). Events like football games, rock concerts, and combat patrols, that previously elicited excitement (ergotropic reactivity), may after retuning be met with a relaxed response (trophotropic reactivity). Some theorists have argued that ritual control of ergotropic-trophotropic balance is fundamental to virtually all primitive healing techniques and to the evocation of alternative phases of consciousness (Gellhorn and Kiely 1972; Kiely 1974; Lex 1979).

There are several ways that ergotropic-trophotropic retuning may be accomplished.

1. Rational Mediation. Under certain circumstances the rational

faculties mediated by the cerebral components of the two systems may intercede to modify tuning. A particular emotional response may come to be recognized as inappropriate to a situation, and this knowledge may result in some retuning. This response is common to many forms of group therapy.

2. Heightened Awareness. Increased attention to one's own psychodynamics may result in perceiving and intuiting the cognition producing an ergotropic response. The relevating of the operation into consciousness may be sufficient to produce a retuning. An example would be the cognitive therapy of A. T. Beck (1967) in which techniques are used to uncover the operations mediating affective disorders.

3. Abreaction. By "reliving" a traumatic event in our past, the characteristic tuning of ergotropic-trophotropic functions may be altered. This is particularly useful in cases where autonomic and limbic responses are linked to images operating unconsciously to ego.

4. Drivers. As noted earlier, lower autonomic systems may be tuned and retuned directly by penetration from external stimuli without necessary intervention of higher ergotropic-trophotropic centers (Gellhorn and Loofbourrow 1963; Lex 1979). These stimuli are called *drivers* and may take the form of repetitive stimulation such as drumming, flickering light, chanting, or sexual intercourse. Drivers may be used in ritual circumstances to generate simultaneous discharge of both systems (e.g., orgasm), which sets the stage for a radical retuning of the systems relative to particular stimuli (Lex 1979). Such drivers are an example of symbolic penetration at the level of the autonomic nervous system.

The first three methods of retuning—rational mediation, heightened awareness, and abreaction—tend to be evoked, so to speak, from the top down ("top-down retuning"). The fourth method, the use of drivers, may work from the bottom up ("bottom-up retuning"). That is, the first three tend to require retuning of higher cortical systems before lower limbic and autonomic-endocrine systems follow suit, but the last method operates directly upon lower autonomic-endocrine-somatic systems first, followed by higher-center retuning. Rational mediation is notoriously ineffective when the system has been tuned in association with image-centered trauma. Such associations (entrainments) are typically established during pre- and perinatal life, or early childhood, when virtually all learning involves autonomic-somatic and imaginal systems, rather than higher cortical processing (Piaget and Inhelder 1969).

THE PHYSIOLOGY OF PSYCHIC ENERGY

We have distinguished many structural invariants in the experience of psychic energy in higher phases of consciousness. We have examined theoretical concepts by which we may speak of the relationships among neural and other somatic systems and sensorial events. And, we have surveyed the literature on the psychophysiology of meditation, particularly relevant to metabolic processes and consciousness. We have determined that the best perspective from which to formulate a tentative theory of psychic energy is via the ergotropic-trophotropic model of metabolic energy distribution. We now wish to link these elements to suggest an account of psychic energy experiences in higher phases of consciousness. We realize that not only sensorial events but also their structural invariance must be explained.

We have defined psychic energy as the experience of activity of fields of dots within the sensorium. All that we are, or ever can be, phenomenally aware of is composed therefore of psychic energy, which includes our awareness of metabolic events occurring in our body. We know that we need nutriment when we feel hungry, that we are injured when we feel pain, that we are relaxed when we feel calm, and aroused when we feel excited. Some people have unfortunate neurophysiological disorders that prevent them from feeling pain when they have been injured. And many of us walk around not knowing that we are hypertense, unaware mainly because we are "disconnected" from our bodies. But when the systems of the body are operating in an ideal state of uninhibited or unobstructed interpenetration, we may say that a process of homeomorphogenic interpenetration exists between the sensorium and its activities and the greater organism and its activities. This is tantamount to a microcosm-macrocosm relationship—one of partial isomorphism—in which events in the body are represented by (expressive mode), or produced by (integrative mode), patterns in the flurries of dots within the sensorium. The cognitive system is designed to detect invariance in the patterns formed within the field of dots and to construe a cognized environment from the totality of such patterns.

Thus, patterns of sensorial psychic energy may be in some instances the consequence of metabolic events in the body, and in other instances may be the cause of metabolic events in the body. One feels pain when a finger is cut, but one can also produce somatic responses characteristic of injury by vividly imagining a cut finger. The causality between sensorial and nonsensorial somatic events is interactional.

Furthermore, the sensorium, like the rest of the nervous system, participates in ergotropic-trophotropic balance. That is, the sensorium registers somatic events energized by the bicameral ergotropic-trophotropic system, and is thus a part of their organization. Simply put, an excited somatic system produces an excited consciousness, and vice versa. A calm consciousness is mediated by a calm body. There is no such thing as a calm mind in an excited body. When tuning is in favor of trophotropic activity, this activity includes a predominance of trophotropic activity within the sensorium. The same may be said for predominantly ergotropic tuning. An ergotropically tuned sensorium may be a welter of rapid, even confused thoughts, sensations, and images, whereas a trophotropically tuned sensorium may be fairly clear, even blank.

HIGHER PSYCHIC ENERGY EXPERIENCES. Homeomorphogenic relationships between sensorial and nonsensorial ergotropic-trophotropic events continue to operate in higher phases of consciousness and experiences of psychic energy. From the model presented above, we may hypothesize four categories of ergotropic-trophotropic events and their sensorial concomitants, which may occur during extraordinary phases of consciousness.

1. Hypertrophotropic Tuning. Trophotropic activity is tuned exceptionally high resulting in an extraordinary state of relaxation. This activity happens of course in normal sleep but may paradoxically occur during meditative phases accompanied by keen alertness and vigilance. In extreme form, hypertrophotropic tuning may be experienced as a sense of oceanic tranquillity and peace in which no thoughts or fantasies intrude upon consciousness and no bodily sensations are felt. The meditator feels as though he were floating on a waveless sea. In Buddhist psychology this state might be termed *access concentration (upacara samadhi).*

2. Hyperergotropic Tuning. Ergotropic activity is tuned exceptionally high, resulting in an extraordinary stage of unblocked arousal and excitation. This stage may occur under various circumstances where output of motor activity is continuous and rhythmical, as in dancing, long-distance running, swimming, or rock climbing; or where continuous processing of information becomes so voluminous that interjection of thought and ego-centered decision making would prove disadvantageous, as in motor car racing, or piloting a jet fighter. This state will also be associated with keen alertness and concentration in the absence of superfluous thought and

fantasy. The practitioner feels as if he were channeling vast quantities of energy effortlessly through his consciousness. This is the quintessential flow experience noted earlier.

3. Hypertrophotropic Tuning with Ergotropic Eruption. As noted by Gellhorn and Kiely (1972), under certain circumstances both systems may discharge simultaneously. In this case, the meditator is in a state of oceanic bliss, and perhaps by intensifying his concentration upon the object of meditation, he experiences absorption into the object (*appana samadhi* in Buddhist psychology), an experience inevitably accompanied by the sense of a tremendous release of energy. The meditator may experience one or another of the "active" blisses, energy rushes, and other movements and sensations in the body.

4. Hyperergotropic Tuning with Trophotropic Eruption. Simultaneous discharge of both systems may be attained via the opposite route. The practitioner may experience a trophotropic discharge in the midst of hyperergotropic tuning as a consequence of enhanced concentration and of trophotropic drivers such as rhythmic stimuli like mantra. The practitioner may experience an orgasmic, rapturous, or ecstatic rush arising from a generalized sense of flow. This experience may occur as a result of practices like Sufi dancing and marathon running.

DRIVING AND PEAK EXPERIENCES. Both the ergotropic and the trophotropic systems may be driven directly, either from the top down or from the bottom up. The dancing of the Bushman adept that evokes the arising of *n/um* is an example of hyperergotropic activity driven by rhythmic motor activity, erupting, under proper conditions, in a trophotropic experience in which the *!Kia* mind state arises. The dancing, a bottom-up driver, is also operating initially upon the lowest level of ergotropic-trophotropic organization. Another common bottom-up driver is fasting, a practice often preceding or accompanying other more active ritual procedures (e.g., North American Indian vision quests). Fasting is known, not only to reduce caloric and other nutriments available to cells, but also to decrease the amount of important hormones in the blood, as well as their receptor-cell sensitivity, thus providing a probable mechanism of energy conservation at the cellular level (Schussler and Orlando 1978). Fasting may thus be interpreted as a bottom-up driver of trophotropic activity, due to its tranquilizing effect upon the body.

The two systems may be driven as well from the top down. This event is frequently accomplished by concentration upon imagery,

which we have already noted may produce an increase or a decrease in somatic arousal, depending upon the content. Prolonged and intense meditation ("devotion") upon a lotus above the head, or upon a Sacred Heart in the chest, may first result in ever more enhanced concentration leading to hypertrophotropic activity and, under the proper conditions, to an ergotropic discharge—perhaps a minor release at one of the sympathetic plexes, or a complete discharge throughout the system experienced as Pandit Krishna's "*kundalini* awakening" or Saint Margaret Mary's sustained "rapture."

THE PRINCIPLE OF HOMEOMORPHOGENIC RECRUITMENT. Psychic energy is usually felt as bodily sensations, or "seen" as visions of energy flows as just described. Occasionally there may be auditory or other sensory modal components to the experience. The point to emphasize is that the sensorial components of the experience bear a homeomorphogenic, causal relationship to the ergotropic-trophotropic transformations associated with them. If they are expressions of those transformations, sensorial events are brought into synchronous entrainment with the ergotropic-trophotropic events. If they are initiators of those transformations, then sensorial events bring the greater ergotropic-trophotropic events into entrainment.

Whether top-down or bottom-up drivers are operating, the key element is usually concentration upon a single process or object leading eventually to harmonious, homeomorphogenic entrainment of operating systems at all levels of the hierarchy. We may thus define a *principle of homeomorphogenic recruitment:* sustained concentration of attention upon an object or process, if carried out with sufficient intensity, will tend to recruit and eventually entrain most, if not all, somatic systems at every level of hierarchy within the body. Bentov (1977) has hypothesized that certain meditative procedures lead ultimately to the synchronization of all standing waves of the body to the rhythm of the dominant, aortic standing wave. This explanation could be considered a special case of our principle.

Whether the experience of psychic energy flow is the result of explicitly applied drivers, or due to the spontaneous retuning of the systems as an unintended consequence of inadvertent drivers, the "higher up" the ergotropic-trophotropic systems the effect reaches, the more divergence may be experienced: The range of possible entrainments is most limited at the lower end of the hierarchy (i.e., in autonomic, endocrine, and other somatic systems), whereas it is less limited in the midrange structures (i.e., midbrain and limbic

systems), and least limited at the higher end (i.e., in cortical structures). In other words, we would expect the imagery and intuitive insights associated with psychic energy experiences to vary substantially more from individual to individual, and from culture to culture, than we would somatic and affective components. Much of the apparent diversity in psychic energy experiences cross-culturally derives primarily from different codes used *after the fact* to describe the more symbolic and interpretive aspects of the experience—precisely those aspects that are most easily recalled and described in natural language and art.

STRUCTURAL INVARIANTS AND ERGOTROPIC-TROPHOTROPIC TUNING. And yet, as we have seen, despite different cultural and symbolic traditions, a recognizable structural invariance recurs in the reports of higher psychic energy experiences. We suggest that the sensations of flow common to these experiences derive from the breakdown of body-image entrainment in favor of direct entrainment with proprioceptive fields (i.e., sense receptors that deliver information from muscles, tendons, arteries, etc.) in the body. This breakdown amounts to interpenetration of proprioceptive neural networks and the neurocognitive systems mediating consciousness. The distinct sense of centering, as well as ascending and descending psychic energy, likely derives from proprioceptive sensing of autonomic and endocrinal functions, which are most active in the center of the body. The obvious origins of such activity are the two sympathetic trunks (part of the ergotropic system), which lie on either side of the spine, and the great vagus nerve of the parasympathetic system (part of the trophotropic system), which sweeps down from the base of the brain to emerge at the base of the spinal column to innervate the sexual and other organs. Sensations of circulation and heat at discrete centers of the body, such as the heart region, may be accounted for as proprioception from one of the sympathetic plexes (see Motoyama and Brown 1978).

Visual and other sensory components of "visions" may be accounted for, in part, as homeomorphogenic representations within the sensorium of these proprioceptive inputs. As the usual body image is replaced by the experience of flow, the visual system may become entrained to the process, thus providing the image of a radiant energy body, perhaps as glowing energy centers perceived as a radiant heart, or lotus, or sphere with Saturnian rings. The culturally conditioned expectation of the practitioner will determine the details of the vision and, in particular, the interpretation of symbolic material encountered.

In any event, the unbounded simultaneous discharge of the ergotropic and trophotropic systems seems to set the stage for an ultimate mystical experience, which again exhibits cross-cultural structural invariants (see Stace 1960; d'Aquili 1982). *!Kia*, visitations from Christ, the arising of *kundalini*, all are anticipated and accompanied by profound alterations in the flow and form of psychic energy. As we have shown, those alterations can be explained, in part, by reference to principles of organization operating in the human nervous system.

Clarity of Consciousness and the Theater of Mind

Retuning of the ergotropic-trophotropic balance not only may lead to profound experiences of energy flow within the body and the perception of energy flow events, it may also profoundly alter one's experience of self, world, and cosmos in a manner that has often formed the core of religion in society. The changes may be more or less permanent, as was surely the case for Gopi Krishna and Saint Margaret Mary. The simultaneous discharges of both systems after years of meditational ("devotional") discipline have all the earmarks of a Thomian catastrophe (Thom 1975)—that is, a dramatic morphogenesis resulting from a period of less dramatic change. The period of actual structural transformation at every level of hierarchic organization took months, and very likely years in each case.

This issue is reminiscent of the age-old argument waged among some of the Chinese schools of Buddhism over whether enlightenment occurs in a sudden moment of blinding insight or whether it requires years of maturation. The answer might well be both, depending upon whether one is referring to a moment of overwhelming morphogenesis experienced as a dramatic shift in consciousness, or to the relatively longer period of maturation of the structures to an organization capable of producing that shift in consciousness.

TRUE CONTEMPLATION. In any event, we suggest that there may occur a structural reentrainment produced by a full-scale ergotropic-trophotropic retuning that we may call the phase of *true contemplation*. Just as with the dream phases, this phase of consciousness is one in which *any reality desired by the being may arise in the sensorium*. During a phase of true contemplation, an individual may experience insight, a divine vision, the cessation of all form and even more subtle phenomena, infinite power, and journeys to far-off lands and multiple realities. The key variable in determining the

phenomenal nature of experiences during contemplation is the term *desire.*

DESIRE AND CONTEMPLATION. In the last chapter we developed the notion that phases of consciousness tend to arise cyclically to maximize adaptation to events in the outer operational environment during part of the cycle, and to optimize harmonious adaptation of competitive internal systems vis-à-vis each other during another part of the cycle. It is the task of conscious network to facilitate both of those functions, neither of which may predominate for a long time if the organism is to remain optimally functional. However, in the present context of higher phases of consciousness, those processes have been reintegrated into phases that transcend the rudimentary demands of the organism. The desire giving rise to activity among networks are transcendent—Maslow's (1971) higher "needs"—and result, via homeomorphogenic recruitment, in transcendent or transpersonal experiences arising in the sensorium. Generally speaking, a transcendent experience profoundly disconfirms one's point of view and results in activation of the EMC and growth.

The desires that elicit phenomena in the contemplative phase of consciousness will depend upon many factors, including the stage of development of the contemplative, the cosmology and mythopoeic systems influencing the contemplative through the cycle of meaning, the extent of integration or fragmentation of competing neural networks, and other somatic systems within the being as well as the environmental conditions surrounding the contemplative. The Sun Dance practitioner may have to participate in the ritual many years before a vision occurs. The Buddhist student may meditate for months or years before sufficient calm (trophotropic tuning) arises, enabling higher insights to mature (see e.g., Dubs 1987). The Christian devotee may spend years of purification before the grace of a vision is bestowed. We are referring here to desire elevated to the level of volition, aspiration, and purpose (in the psychological sense).

We are suggesting that a singular stage in neurocognitive development exists, the stage of contemplation, which is relatively rare to human experience because it requires a radical retuning of ergotropic-trophotropic balance. Further, there may arise a variety of so-called mystical experiences, whose phenomenal contents will depend on what is desired by competing networks in the being. This stage of development is in fact coded in some of the more sophisticated esoteric traditions: *upacara samadhi* in Theravadin Buddhism,

mahamudra in Vajrayana Buddhism, *tiferet*, or Beauty, in Kabbalah, and perhaps Bushman *!Kia*. It is a stage characterized by the cessation—at least for the moment—of lower-order distractions such as discursive thought and imaginal fantasy, bodily aches and pains, and mundane worries, and also by the distinctive clarity of perception, and intense, effortless concentration upon whatever object of contemplation spontaneously arises, or is assigned, or is chosen.

THEATER OF MIND. Contemplation is the stage of fruition of the theater of mind. When the practitioner has reached this stage, the multiple realities coded in cosmology and enacted in mythopoeic drama may "come alive" in direct experience. Those networks whose functions are the intentionalities of mythopoeic symbolism are free to express themselves in sensorial events via homeomorphogenic recruitment. But unlike the homeomorphogenic interplay during normal dreaming, the interplay of sensorial events during contemplation is accompanied by, and therefore transformed by, intense concentration and keen awareness. The sensory components of the experiences arising during contemplation are typically lucid, and memory of the events is exceptionally numinous and detailed.

Generally speaking, the phenomenal experiences that may emerge during contemplation may be either ethereal or chthonic, depending upon the degree of integration (thus harmony) or fragmentation (thus competition) in the organization of networks entrained to conscious network. Ethereal experiences might include journeys to the overworld, the realm of deities or radiant beings, or more subtle absorption into radiant light. Chthonic experiences may include journeys to the underworld, the realms of demons or hellish states, the encounter with primordial darkness. All such experiences, we would emphasize, originate and pass away within the sensorium, and are composed of forms within the field of sensorial dots.

Insight tends to arise fluidly during true contemplation, and in direct correlation to the nature and intensity of curiosity—curiosity being but another form of desire, in this case desire for knowledge. Insight may arise through the medium of symbolic imagery in vision or in direct apprehension of knowledge relative to some stimulus event. In paths of insight such as Buddhist *satipatthana* or kabbalistic tarot meditations, the round of curiosity and insight leapfrog until some ultimate experience arises. In the absence of desire, either for symbolic expression on the part of neural networks, or for insight, the sensorium tends to remain blank to everything save, perhaps, sensations of bliss. In some Buddhist schools this experience has been

termed "frozen ice" *samadhi*, and is considered a hindrance due to the lack of curiosity about the nature of phenomena and mind.

No matter how advanced the practice, or mature the contemplative, experiences arising during contemplation are then the object of *post hoc* interpretation (see Reichel-Dolmatoff in Furst 1972; Stace 1960)—Ricoeur's "philosophical reflection"—which tends to be framed within the cosmological views that initially led to the attainment of the experiences. Thus the contemplative participates, at whatever level of attainment, in the cycle of meaning in which his cultural being is lodged. It is this interpretive phase, which usually sets in after the contemplative phase has passed, that facilitates through ratiocination the integration of knowledge gleaned in contemplation with the wider self and cosmological views of the practitioner, and perhaps his fellows.

PORTALING AND INVARIANCE IN CONTEMPLATION. To note the range of variation of detail in experiences during contemplation, either among individuals or cross-culturally, is not the same as saying that no invariant structural features exist among these experiences. Indeed, structural invariance is apparent in all "mythical" experiences once reports are shorn of their idiosyncratic, ideological, and cultural overlays (see Stace 1960; Ring 1974, 1976; Wilber 1980). We have already examined many components of psychic energy in these experiences. There are other universal structural motifs we might discuss as well.

A very common theme in ritual and visionary reports is the passage from one realm of reality to another through a symbolic limen, or portal (see Turner 1974, 1979, 1982). This process is experienced typically as the passage through a door, mirror, hole, or tunnel to emerge, like Alice stepping through the looking-glass, in an alternative reality. We have termed this experience *portaling*, and the symbols and instruments used ritually to evoke the experience, *portal symbols* (see MacDonald et al. 1989). Many objects may be used as portal symbols in ritual, including mirrors, gems and crystals, skrying bowls and pools, cave mouths, and doorways.

We consider portal symbols, and practices accompanying them, to be thoroughly archetypal, and as such we may expect them (1) to be universal, or nearly so, in the mythopoea of cultures valuing experience of multiple realities; (2) to be utilized cross-culturally in a similar manner within the context of ritual practice; and (3) to evoke under proper conditions similar experiences cross-culturally. In particular, we hypothesize that portal symbols will penetrate to the neurocognitive structures controlling the entrainment of phases

of consciousness, and will produce often profound reentrainment of those systems. In other word, portal symbols produce warps in consciousness by penetrating to mechanisms that are internal to the nervous system and that control the transformation of consciousness.

Metaphorically speaking, portal symbols are precisely like doors between rooms, or perhaps keys to the doors between rooms. If we conceive of the rooms as relatively durable phases of consciousness, then the doors are warps. Much of the symbolism in multiple-reality cosmologies pertains to elements and relationships within discrete rooms, but additional symbolism pertains to the relationships between rooms, and to ways of moving between rooms. We are suggesting that transformational symbols have predictable forms cross-culturally because of their efficacy in penetrating to the mechanisms that produce reentrainment of neurocognitive systems mediating the play of experience unfolding in the sensorium.

Furthermore, by directing a practitioner's attention to the warp between phases of consciousness, portal symbols result in opening up the warp to awareness and thereby to cognitive restructuring as a phase. The practitioner thus becomes aware of the process of transformation from one reality to another by focusing awareness upon the portal between realities.

The universal and archetypal potency of portal symbols points the way toward another effective transpersonal methodology for experimentation with and study of such symbols. Very simply, one may meditate upon portal symbols in a disciplined way (i.e., generate a willful semiotropism) and explore the experiences that arise from concentration. Those experiences may then be treated as data concerning the "meaning" or intentionality of the portal symbols (i.e., semiosis). However, the experiences arising for the anthropologist are not necessarily the same as for the native practitioner. The anthropologist and the native usually carry divergent cultural baggage into the experience. Cognized phases of consciousness will differ from culture to culture, and from individual to individual within a single culture—the furnishings in the various rooms of consciousness will perhaps differ from house to house. However, if the portal symbols are indeed archetypal, then a fundamental similarity of experience should occur, if only structurally—all houses of consciousness will have rooms, however furnished.

The anthropologist must be mindful of the warnings that come with the various meditative traditions: The initiate shaman must learn to find his or her way back to "normal" reality. Various safety measures are built into techniques of portaling. In terms of the present theory we may interpret this common admonition to mean that

one must learn to reentrain the phase of consciousness from which one began the exploration. This is usually automatic owing to the lifelong conditioning of "normal" phases of consciousness. But certain measures are generally taken to avert the fear that may easily arise from meditative practices.

AN EXAMPLE: THE TIBETAN MANDALA OFFERING. One of the preliminary meditations *(ngon-dro)* carried out by practitioners of Tibetan tantric Buddhism is termed *dkyil-'khor*, or mandala offering (Beyer 1973, 437ff.). The root *dkyil* refers to the middle or center, and the root *'khor* to a wheel or circle. There are variations on the practice, but they all involve constructing a mandalic form with rice on a round metallic surface and then wiping the surface clean. The practitioner concentrates intensely on the operation of constructing and disassembling the mandala and repeating a mantra, or chant *(gzuns, snags:* Govinda 1973, 92), which speaks of the construction of the mystical cosmos surrounding the mythical Mount Sumeru. The beginning practitioner is expected to repeat this operation at least a hundred thousand times during the process of foundation work. An additional hundred thousand repetitions may be required of a practitioner (usually a monk) who has entered the traditional three-year retreat. The mandala offering is found in abbreviated form as an element in most ceremonies performed in temples. The mirror-rice mandala may be represented using a ritual hand gesture, or *mudra (phyag-rgya)*.

The base upon which the rice mandala is constructed is a circular bowl made of silver or copper, often with symbolic engraving and, occasionally, gold inlay around the rim. It is called *sa-gzhi* in Tibetan, the root *sa* meaning earth or ground and the root *gzhi* meaning foundation. The bowl is used upside down and has a flat, matte-finished surface upon which the rice mandala is constructed.

One of the authors (CDL) undertook the mandala-offering practice during his study of Tibetan arising yoga (see Laughlin, McManus, and Webber 1984). He completed his hundred thousand repetitions during two retreats, a one-month retreat in Canada in 1979, and a two-month retreat in Scotland in 1982. During the first of these retreats he completed approximately eighty-five thousand repetitions while combining the mandala-offering work with meditation on the breath (Skt. *anapanasati*). He worked on the mandala-offering meditation during five one-hour sessions a day. The mirror used was the glass taken from a standard five-inch shaving mirror, which was glued to the bottom of a tea saucer. The saucer provided a handle by which to hold the mirror in the left hand while the

mandalic form was constructed with the right hand. Five pounds of long-grained rice were used, dyed yellow using ordinary food coloring, and lying in a plastic bowl in the lap. A handful of rice was taken up, the mandala completed, the mirror and rice offered up to the guru, and then the mirror swept clean with the right hand, the rice falling back into the plastic bowl, all the while repeating the appropriate mantra.

A journal was kept describing meditation experiences and dreams throughout the retreat. Several experiences and insights arose during the course of that retreat illustrating the experiences that may be evoked by portaling devices. For one thing, most experiences obviously evoked by or related to the mirror work occurred during sleep. CDL, who is a lucid dreamer, had mandalic lucid dreams virtually every night, once the retreat was well under way. A common feature of these episodes was the appearance of a circular, opaque disk upon which a variety of symbolic forms arose. These episodes usually occurred as lucid phases immediately after a more ordinary dream. According to his dream diary, on one occasion

> the disk was back, consisting of two concentric circles, the inner more opaque than the outer, and there developed for several moments a rapidly transforming series of abstract characters flowing from a central vertical diagonal toward the periphery in a horizontal flow. Not all characters were symmetrical. . . . I was staring through this mandala at scenes beyond . . . [scenes being common hypnopompic imagery].

On another occasion, there arose

> a brief mandala episode during which a field of bright yellow flowers sprang out of a circular mirror and emitted great energy and, as it were, spit a blob of black something out of its center which then paused a moment and then melted into black drops and fell away. This occurred, as usual, several times.

Relevant motifs often arose in the normal dream state as well:

> I am in the ocean in a very sunny clime, flying a round, yellow-orange kite which pulls me out into the ocean and up to some interesting rock formations that seem to be made of piles of rice. I have gotten deeper in the water, but just as I am about to go under, I note that the rock formations begin to take on an ominous quality with eye sockets, etc. I lock my concentration into a "real" dark profile of a male driving the car I'm in. I can't seem to make out the face clearly. Then I am aware of the lights increasing in intensity from above (I am fully aware at this point and am entering lucid phase) and concentrate on the lights and that brings on a full-blown mandala experience.

By "full-blown mandala" experience is meant an intense light-show during which the entire visual screen is filled with brilliant lights usually appearing to emerge at the center in waves that radiate outward to the periphery in a continuous flow. As constantly shifting

and changing patterns, sometimes incorporating human and other forms, sometimes remaining amorphous, the experience is associated with intense bliss and ecstasy and an extremely keen awareness and deep concentration. When these lucid dream experiences first arose many years prior to the mirror exercises just described, they would last only a few minutes. During this retreat CDL was able to sustain the experiences up to thirty minutes at a time by maintaining intense concentration on the center of the everchanging mandala.

Associations were frequently made in dream state between mirror, opaque disk, and bodies of clear water. All seemed to be equivalent metaphors for the reflexive quality of mind. This association is hardly surprising. In Buddhist tradition the most commonly mentioned symbols signifying the illusory nature of phenomena arising in the mind are motifs such as the reflected image in a mirror, the moon reflected in a pool of water, and a continuously moving stream.

Lucid mandala phases commonly involved a three-dimensional effect of traveling through tunnels into radiant light or into space. Sometimes in dream and in meditative vision, a tunnel would become a "space door" or portal into vast interstellar spaces and radiant spheroid forms, or spacious landscapes. These portals would usually constitute a limen signifying the point of transformation between one state of consciousness and another. Over time, the range of states became increasingly varied and differed ever more subtly one from another. Sometimes there was fear of passing through the portal, sometimes the awareness would pass through and shoot down a passage or tunnel at great speed into brighter and brighter light, or into expansive, crystal-clear awareness of empty space. The mind grew to understand that it could either resist passage because of fear or let go into whatever experience lay ahead. The consciousness often seemed to be polarized relative to the mirror, a part that wished to "pass over" and a part that wished to remain behind, and depending on which part was stronger at the moment, the experience would follow it.

The mirror and yellow ricelike energy particles became core symbols in dream and meditation vision thereafter. CDL recalls an occasion two years or so after the retreat when he was visiting the monastery of one of his teachers in Nepal. It was late at night and frightening apparitions were appearing before him in a lucid dream phase. In despair, he called out mentally to his teacher for help, and the image of his teacher appeared in a vision sitting on a throne and concentrating upon a gilt-edged mirror hanging on the wall. The vision zoomed in on a close-up of the mirror. A ray of yellow light composed of distinct particles beamed down onto the mirror and was

reflected away. Laughlin became simultaneously aware that all of the apparitions that had been so frightening were merely transient piles of rice grains on the mirror of mind—in other words, insubstantial. The sense of despair lifted and, although apparitions continued to arise, the knowledge of their illusory nature was never forgotten.

Mirror surface motifs seem to be of two types: reflective mirror surfaces that we in the West commonly associate with the concept "mirror," and opaque surfaces that resemble the matte surfaces of Tibetan, Chinese, and shamanic ritual "mirrors." It is interesting that of the two types the opaque surface proved to be the most common in CDL's experiences, even though he used a reflective mirror, unlike the matte ones used by Tibetan yogis.

A split-image motif was very common in the mandala-offering work, and has proved a common feature of other types of mediation, both in CDL's personal experience and in the reports of other meditators he has interviewed. The lateral asymmetry may take a diverse form including, for example, the left side murky or dark and the right side clear or bright, a flow of energy streaming left and right from a central vertical seam or axis, and different human figures appearing on the left and right sides. In true mandalic form, the center of the visual field was often the locus of symbolic significance, with or without lateral asymmetry of form. Foveal symbolism included gemstones, spheres, tunnels, geometrical figures of various sorts, eyes, and nexuses of crosses. It will be remembered that the classic definition of a mandala is a quartered circle with a center (Jung 1969).

VOID CONSCIOUSNESS

There is a good deal of evidence that portaling symbolism and full-scale portaling experiences arise spontaneously, particularly under the influence of psychotropic drugs (Kluver 1966; Siegel 1977). Portaling is a common motif in shamanic art, and presumably in shamanic "journey" experiences, as recounted for cultures over much of the world (McDonald et al. 1989). We have emphasized portaling because some work has been done on the psychological concomitants of the phenomenon, and because this symbolic motif is directly associated with warp control discussed in an earlier chapter. We have also emphasized the significance of gender symbolism in contemplative phases. At this time we could as easily discuss other universal features of higher phases of consciousness such as the experience of mystical light or illumination (Eliade 1965), or of

totality (Chang 1971), for they are motifs equally amenable to a biogenetic structural approach.

However, we wish to conclude by noting that many mystical traditions report the occurrence of ultimate awareness (see Walsh and Vaughan 1980; Wilber 1980; Nishitani 1982). This experience has been labeled in many ways: God Consciousness, *kether*, Cosmic Consciousness, nirvana, *satori*. Kenneth Ring (1974, 172; 1976, 78) uses the term *Void* in his useful typology of transpersonal experience. D'Aquili (1982, 366) has used the phrase "absolute unitary being" for the same level of consciousness, and reports some interesting psychiatric and philosophical aspects of related experiences.

The direct experience of Void Consciousness has been repeatedly affirmed by adepts from many cultures and many eras (see Goleman 1977). The experience is decribed as ineffable, either positive or neutral, and, therefore, best expressed using metaphor (d'Aquili 1982). Yet it is possible to articulate both the logical and empirical necessity of the experience (as David Bohm 1980 has implied; see also Wilber 1982, 44ff.), and the cognitive transformations that occur as a consequence of the experience (as Franklin Merrell-Wolff 1973a, 1973b has done; see also Burridge 1979, ch. 11). The resulting changes in cognition are most important from our point of view, for the cognitive transformations wrought by the attainment of Void Consciousness have major implications for the anthropological enterprise when viewed from a transpersonal perspective.

Merrell-Wolff has described very clearly the changes in his consciousness leading to, and subsequent to his attainment of, Void Consciousness. Of particular note is his characterization of the series of insights ("Recognitions") leading to the realization of Voidness and its effect upon his general philosophical outlook:

> Probably the most important permanent effect of the whole group of Recognitions is the grounding of knowledge, affection, and the sense of assurance on a base that is neither empirical nor intellectual. This base is supersensible, superaffective, and superconceptual, yet it is both conscious and substantial and of unlimited dynamic potentiality. I feel myself closer to universals than to the particulars given through experience, the latter occupying an essentially derivative position and being only of instrumental value, significant solely as implements for the arousing of self-consciousness. As a consequence, my ultimate philosophic outlook cannot be comprehended within the forms that assume time, the subject-object relationship, and experience as original and irreducible constants of consciousness or reality. At the same time, although I find the Self to be an element of consciousness of more fundamental importance than the foregoing three, yet in the end it, also, is reduced to a derivative position in a more ultimate Reality. So my outlook must deviate from those forms of Idealism that represent the Self as the final Reality. In certain fundamental respects, at least, the formulation must accord with the anatmic

doctrine of Buddha, and therefore different in important respects from any extant western system. (1973a, 76)

The experience of Void is, in part, one of recognition, of knowledge. From our perspective, Voidness is perceived only when the neural structures mediating the cognitive aspects of experience within the sensorium are sufficiently matured in their development that this advanced knowing may arise. The realization of the experience itself is sudden—a rapid "coming together" of knowledge and experience, and the instantaneous obliteration of all conceptual distinctions, including those maintaining any boundaries to consciousness. The experience of the Void is a phase preceded by a warp—what we will call the *transcendental warp*.

The "coming together" (entrainment) of neural structures at the transcendental warp seems to be a permanent stage in the development of the perceiver's neurocognitive system. It bears the plateau characteristics of other previous stages of cognitive development (à la Piaget), and its effects as a developmental transformation eventually permeate all cognition and experience.

Two of the effects most evident from Merrell-Wolff's description are the loss of ego-centeredness in experience and the loss of the view of the world as a concrete objective reality. Completely absent is any view of self as permanent, impermeable, seamless entity, or empirical ego. Gone as well is a cognition grounded in the belief that the phenomenal world is solid or fixed. Awareness is now grounded upon Voidness, which is to say upon the direct experience of a reality that is beyond transient phenomena, beyond feeling, and beyond concept. All phases of consciousness are experienced, in a sense, as equivalent, and there is no ego-identification with one phase rather than with other phases.

It is the dissolution of those views—that is, the reentrainment of the operating neural structures mediating the cognized environment—that *is* the transcendental warp. An effect of this transformation is to reorganize the conditioned entrainments mediating the experience of a permanent "me" as somehow distinct and removed from an objective world "out there." Because the shift in view affects experience of self and world simultaneously, the changes we are addressing do not result in simply a shift from a positivism to a subjectivism. Rather, there is a complete reorganization of operating neural structures so that neither a positivistic nor a subjectivistic paradigm accurately describes observation informed by the experience of the Void. Both positivism and subjectivism are oversimplistic and dualistic relative to a *transcendental paradigm*. In a

transcendental paradigm observation is carried out from an experience of totality in which "subject," "object," and "observation" are only labels for a partial view of what is really a single, completely integrated process—a process which is inseparable from the field of potentialities that is the Void.

NOTES

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2. It is interesting that the word *axis* derives from the Latin for *axle*, thus denoting a center around which something turns.

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