

RELIGIOUS EXPERIENCE, ARCHETYPES, AND THE NEUROPHYSIOLOGY OF EMOTIONS

by James P. Henry

Abstract. Established religions integrate a society's everyday secular realities with humankind's numinous experience of the holy. Powerful emotions nourish the cultural expression of the archetypes propelling the "ritual dances" of art, sport, and technocracy. During sacred moments such as mother-infant or adult bonding, neuroendocrine triggers activate lifelong ties. The cultural canon of the left cortex contrasts with the intuitive right. Brainstem "switches" alternate the left's cool, extraverted, sympathetic drive for control with the right's "warm" attachment behavior and dreaming sleep. Psychic trauma damages flexibility with resultant alexithymic blindness to emotions and archetypes. Substance abuse and narcissistic overemphasis on control ensue.

This paper opens by using the disclaimer with which Carl Jung closed his commentary on the Taoist tract, *The Secret of the Golden Flower*. It runs: "The fact that I restrict myself to what can be psychically experienced and repudiate the metaphysical does not mean, as anyone with insight can understand, a gesture of skepticism or agnosticism pointed against faith or trust in higher powers, but what I intend to say is approximately the same thing Kant meant when he called '*das Ding an sich*' (the thing in itself), a 'purely negative borderline' concept. Every statement about the transcendental ought to be avoided because it is invariably a laughable presumption on the part of the human mind, unconscious of its limitations. Therefore, when God or Tao is spoken of as a stirring of—or a condition of—the soul; something has been said

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about the knowable only but nothing about the 'unknowable.' Of the latter nothing can be determined" (Wilhelm & Jung 1935, 135).

RELIGION AS A UNION OF THE CULTURAL CANON WITH EXPERIENCE
OF THE SACRED

In 1967 sociologist Peter Berger authored the groundbreaking *The Sacred Canopy* (1967). It presented the elements of a sociological theory of religion and carried considerable weight. In 1974, in some "second thoughts" on substantive versus functional definitions of religion, he comments that the scientific study of religion must bracket the ultimate truth of the claims implied by its subject (Berger 1974). Neither the nature nor the existence of the gods can be verified through the complex of human experience and thought that purports to refer to them. Therefore, within the framework of science, the "gods" will always appear in quotation marks.

As philosopher W. T. Stace puts it in a discussion of the Negative Divine, God is "nothing" to the conceptual intellect. It does not mean that he has no positive being but only that his positive being, though revealed to intuition, is hidden from intellect. Or as theologian Hans Küng puts it in *Does God Exist?* "It seems impossible to deduce God by theoretical reason from the experienced reality of the world and man in order to demonstrate his reality by logical reasoning" (Küng 1980, 548). God can only be accepted by faith in a transcendental, non-rational sense. "He is himself source, center, and goal of the world process" (Küng 1980, 649). Commenting on religious experience, Jung says that only if one takes cognizance of the foundations of consciousness and moves toward the unconscious can there be religious experience and sense of individual relation to God. He warns that this is not to say that what is called the unconscious is identical with God or is set up in his place, but it is the practical medium from which religious experience seems to flow. As to what the further cause of such an experience may be, the answer lies beyond the range of human knowledge: knowledge of God is a "transcendental" problem (Jung 1957).

The religious experience to which Jung refers is discussed by Berger in the terms used by the theologian Rudolf Otto, author of the classic *Idea of the Holy*. Berger cites Otto's criteria of the numinous or sacred as occasions when the reality of everyday life is dramatically deprived of its usual paramount status. To Otto, typical elements are the emotion of dread together with awe and a sense of personal insignificance. He adds to this a fascination with the mysterious and the sense that one is outside the sphere of the usual, intellegible, and familiar (Otto [1923] 1952). Berger refers to the ecstasies produced by music, by the erotic, and by pure mathematics as preliminaries to religious mysticism (Ber-

ger 1974). He agrees with Otto that this is the realm of the uncanny. Jungian psychiatrist Jean Shinoda Bolen, in her recent book on the psychology of women, relates a typical experience. It occurred during her wedding. Brought up as a middle-of-the-road Protestant, no mystery or magic had accompanied the ritual of that religion. In fact, to her the communion sacrament was a commemoration that used Welch's grape juice. Thus it was quite unexpected when this sophisticated physician was struck by an awesome inner experience. She describes herself as being swept into the feeling that she was participating in a powerful ritual that involved the sacred. There was a sense of experiencing something beyond ordinary reality—something numinous. As she recited the vows she felt as if she was participating in holy rites (Bolen 1984). Her description of the event is of an "archetypal experience." She was involved in the ritual enactment of a sacred myth.

Astronaut Eugene Cernan has recently described a similar awesome experience. Speaking of the United States space program as the "greatest of human endeavors" and of his own feelings on the sterile moon far from the nurturant biosphere of "Mother" Earth, Cernan writes: "When I was the last man to walk on the moon in December 1972 I stood in the blue darkness and looked in awe at the earth from the lunar surface. What I saw was almost too beautiful to grasp. There was too much logic, too much purpose. It was just too beautiful to have happened by accident. It does not matter how you choose to worship God or by whatever name you call him but he has to exist to have created what I was privileged to see" (Cernan 1985).

To Berger, religion has this role of adding another dimension to everyday experience but at the same time keeping it within bounds and controlling it with ritualized occasions such as the mass, baptism, or burial services. We live in the ordinary, but on special occasions we have the ordinary breached; eventually we return to the ordinary. For the adherent of an established religion, ordinary social life is held in place by these rituals. Thus, religious institutions assign the disruptive aspects of the other reality to carefully prescribed times and places. They domesticate the ecstasies and channel them into socially acceptable "moral" conduct. In some cases they even manage to convert the religious definition of reality into legitimation of the secular, sociological order (Berger 1974).

For Ralph Burhoe the two modes that religion integrates are expressions of humanity's separate natures. The genotype of the evolving apeman provides humans with a series of images genetically derived from the process of evolution including that of the last few million years. The inherited behavior patterns that natural selection has picked out for *Homo sapiens* include: mother-infant attachment be-

havior, the adult as well as infant "need to be held," incest taboo between familiar siblings, respect for the aged, adult male camaraderie, male tenderness to the female and to the young, and so on. These responses help to glue the social group together and form the bases for systems of religious beliefs. They are inherited patterns with the characteristics of archetypes. Using myth, dogma, and ritual, religion synthesizes this genotypically programmed system of values with a separate set of values that derive from the rules and customs with which the group adapts to the prevailing sociocultural situations (Burhoe 1979).

Unlike other primates, we inhabit a universe perceived in terms of the artifacts of architecture, transportation, agriculture, and industry which have been developed by our culture. A huge body of rules, standards, and general principles is handed down from generation to generation by each society. It is commonly regarded as so undeniably true and valid that it may be called a cultural canon (Henry & Stephens 1977). As such it carries some of the weight of a sacred dogma. For example, the ritual observances connected with the flame and flags of the Olympic games are carried out with a devotion and dignity appropriate for the myths of a religion. An ethological view would be that profoundly stirring emotional archetypes connected with the basic territorial and attachment instincts are involved. From the viewpoint of social interaction, the games represent a culturally advanced celebration of important human values including the courage and motor skills of the hunter, the discipline of teamwork, and the dedication needed to acquire the skills involved.

The religious problem of modern humanity, as seen by Burhoe, is that science and technology have so drastically and rapidly changed our culture that we have lost the needed effective fusion of genetic and up-to-date, acquired traditions. Most of the traditions characterizing present established religious rituals came into being many hundreds of years before the mechanical, electronic, and knowledge revolutions (Burhoe 1984).

Roger Sperry echoes Burhoe's concerns in his discussion of the union of science with ethics and religion. Our genetically inherited value systems are not adapted to the realities of contemporary technocracy (Sperry 1983). In a dramatic recognition of this, China has recently limited the bonded male and female's urge to reproduce. It must be controlled to two children at most because of the grave threats posed to the ecosystem by overpopulation. Crises multiply as our hunter-gatherer genotype fails to provide the proper instinct-driven practices, nor do the established religious cultures with their traditions stemming from long before the industrial revolution do any better. Sperry argues

that conscious decisions must be taken by the groups' representatives and based on the most advanced rational cognitions. These must then be woven into a new mythology of genotypic and cultural institutional practice which is as morally compelling as the established religions used to be (Sperry 1983).

David Hamburg has made the point that even the extraordinary difference between a hunter-gather's life-style and that of the modern world, as transformed by science and technocracy, can be bridged if there is a proper understanding of the mechanisms underlying the operation of the human central nervous system (Hamburg 1984). Burhoe perceived religion as capable of this bridging of the gap because the brain our genes have given us connects reason with our genetically determined motivation (Burhoe 1979; 1984). In a paper on this same problem of bridging science and religion's values, Sperry says the brain is designed as a goal-directed, value-guided, decision system. The "ought to be" or values, he says, can indeed be determined on the basis of facts (Sperry 1979). Stephen Clark points out that we do not have to rely on the working of reason alone: he has presented the evidence that there is an animal behavioral basis to morality. His review of mammalian behavior points to the strongly constructive programming of our instincts. We inherit a genetically determined system of values that evolved from the need to survive (Clark 1982). But today we are also aware of ourselves as part of the world's ecosystem. The myths or the archetypes which drive us are derived from neuroendocrine patterns of instinctual response; but as symbol systems they are also represented at the most abstract intellectual level. Thus they form the link between the emotions of our genetic inheritance and the abstract decisions of science and reason.

INSTINCT-ARCHETYPE AS LINK BETWEEN THE RATIONAL-COGNITIVE AND GENETIC PATTERNS OF EMOTION

In the regions below the human brain's huge association cortex, there are hormone-driven neuronal complexes mediating the emotions and behavior critical for self and species preservation (MacLean 1975). Indeed, Paul MacLean's group has shown that, even when their cortex has been destroyed, hamsters can still fulfill all aspects of maternal behavior; and the behavior of animals with a rudimentary neocortex and with no opportunity to learn from others remains goal-directed and purposive (Murphy, MacLean & Hamilton 1981). A bird, for example, will progress with motivated behavior from the original determination of territory by song or display, through the complexity of nest building and through brooding, to the feeding and raising of chicks—each stage being preceded by the release of the appropriate

hormone (Hinde 1982). Although deficient by human standards in associational cortex and simple-minded to the behavioral psychologists' tests, a young beaver needs only running water and a supply of sticks and mud to graduate without instruction to the remarkable complex engineering behavior of building an integrated dam, canal, and lodge system (Wilsson [1964] 1968). Recent work has conclusively shown that in the rodent it is necessary to give two hormones, progesterone and estrogen, in order to secure maternal behavior (Bridges 1984). A region at the front end of the hypothalamus is critical; on the other hand, without testosterone, a male rodent will not persist in efforts at problem solving (Thompson & Wright 1979). Success in competition induces increased testosterone levels in male mammals including man (Mazur & Lamb 1980). There is increasing evidence that in females as well as males the significance of testosterone lies in the persistence that comes with the achievement of status (Purifoy & Koopman 1978).

The fact that sex-specific patterns of neuronal development are triggered by levels of sex hormones in highly specific regions of the brain, not only in rodents but probably in humans, is one aspect of the extensive body of new data persuading us of the existence of sexual differentiation of instinctual or archetypal behavior patterns in human beings (Hines 1982). Daniel Hier and William Crawley have recently presented evidence that high levels of androgens at puberty are needed for the normal development of spatial abilities such as the rapid finding of a design camouflaged by extraneous lines (Hier & Crawley 1982). The significance of this work is such that it is hotly debated, as is the new evidence in rodents and humans that a homosexual predilection may stem from stress in the mother during pregnancy (Durden-Smith & deSimone 1983). Yet journals such as *Hormones and Behavior* are flourishing and with each year the evidence they are building up becomes still more impressive.

The term *archetypal* is applied to the individual, subjective aspects of a tendency to adopt certain behavioral patterns. Synonyms are *myth* and *divinity*, and in *Goddesses in Everywoman* the Jungian analyst Bolen uses Greek mythology to differentiate the archetypal forces that influence what women feel and do as parents as opposed to their behavior as administrators or as spouses, lovers or children, or as friends. The individual woman can be biased to assume various modes as determined by the different levels of hormones in emotional states and at puberty, at pregnancy, and at menopause. Bolen describes the sensual adolescent response of the young girl, likening her behavior to the patterns of Aphrodite. These differ sharply from the logical and fact-dealing Athena mode which can appear more strongly during the

estrogen-loaded first half of the menstrual cycle (Bolen 1984). Such mythic role playing behavior is not purely learned and arbitrary but neither is it purely voluntary. To a significant degree it is determined by the interaction of experience with the level of hormones affecting receptors in critical regions in the central nervous system.

Social recognition of this hormonal-personality interaction is expressed by the fact that it is a legally acceptable addition to the defense to show that a crime was committed while undergoing premenstrual tension (Dalton 1980). There is increasing evidence especially in sheep that the hormonal levels at the time of parturition are critical in determining the attachment of mother to infant. Once this attachment has occurred, it persists for an important part of the life cycle. To a less dramatic degree the same occurs in humans. Marshall Klaus and John Kennell have shown that, if a mother must defer the fondling of her newborn baby for hours or even days, it is harder for her to become attached and devoted to it. Such is not the case if allowed to care for it within minutes of delivery. The precise circumstances at the moment of birth importantly facilitate her later response (Klaus & Kennell 1976). This is one reason why premature infants, isolated from the mother during the critical weeks after delivery are often not well bonded (Klaus & Kennell 1970). New work is showing how the verbal, together with the subtle nonverbal interchanges that go on between mother and young infant, determine their attachment (TrevARTHEN 1983). Evidence of the intensity of the bonding is seen in the severity of the behavioral depression and the intensity of the pituitary-adrenal cortical response that accompanies the loss of one primate partner by the other (Coe et al. 1978).

Quite another field shows this archetypal determination holds steady for a lifetime. The Kibbutzim of Israel lack inclination to mate if they are brought up together as infants in the communal nursery. In 125 marriages of the second generation, Yonina Talmon found not a single case where two people reared in the same peer group married, nor were there any love affairs (Fox 1980). Yet these men and women were as devoted to each other and as affectionate as any other family. Intrigued, Joseph Sheper followed up with the records of 2,769 Kibbutzim. Not a single marriage occurred when they had been together during the period from birth to six years. He argued that here was a case of the reverse of mother-infant bonding (Sheper 1971). As long as siblings are closely and intimately associated during the critical period from birth to six years, they will avoid postpubescent sexual relations if they can: it appears that familiarity prevents the attachment emotions or archetypal responses.

Phobias may be a further example of archetypal machinery at work. Mats Fredrickson, Örjan Sundin, and Marianne Frankenhaeuser have

shown that, when phobics but not normals were exposed to slides of snakes, spiders, or blood and mutilation, there was a sharp increase of the adrenal cortical hormonal excretion. They see this as due to a specific neuroendocrine distress response to these objects (Fredrickson, Sunden & Frankenhaeuser 1985). It is known that primates which have never seen a snake before show strong responses of fear to one crawling on the floor. Sverre Torgersen, in a study of twins, showed that genetic factors played a part in these phobic responses. The fact that phobias more commonly occur to objects and events which our hunter-gatherer ancestors would also fear suggests that inherited patterns may be involved. They include: fear of heights, spiders and snakes, rats and mice, thunder and lightning, blood and wounds, illness and death, eating with strangers, being watched and being crowded or confined (Torgersen 1979). Joy Melville starts her chapter on agoraphobia or the fear of open spaces in her *Phobias and Obsessions* with the following classical descriptions of the phobic enhancement of caution at going outdoors: "It was at first like living in a nightmare." "The sensations experienced can be overwhelming: pounding heart, dizziness or fainting, palpitations, sweating or a sense that 'something' terrible is about to happen" (Melville 1977, 13-14). These emotion-laden descriptions match Bolen's experience of inexpressible numinous feelings on the occasion of her marriage in a cathedral (Bolen 1984). Just as prisons are designed to depress and subordinate the prisoner's aggressive responses, so cathedrals and their services are designed to enhance the feelings of reverent awe—with their great height, stained-glass windows, incense, pageantry, low frequency organ music, and sonorous chanting.

Noam Chomsky has long argued that inherited brain structures determine the syntax by which the young child races to speech with a rate and a fluency that makes us unique among primates. Children will even use pronouns correctly, in spite of hearing grammatical errors made by their parents (Chomsky 1972). Paul Ekman and others have demonstrated that there are universal facial expressions of emotion. Detailed and extensive studies disentangled the role of culture, and, despite the many anatomically possible facial muscular configurations, only a fraction are universal expressions. Regardless of language or whether the culture is Western or Eastern, industrialized or preliterate, happiness, sadness, anger, fear, disgust, and surprise all elicit the same facial expressions (Ekman 1971). New Guineans who have had no prior contact with our culture make the same facial gestures for anger and grief as we do (Henry & Stephens 1977).

People all over the world also make the same threat displays and perform the same subordinate to dominant respect rituals and adult consort embraces (Henry & Stephens 1977). These are basic role ges-

tures that we all hold in common. The idea of the myth of archetype is that it represents the subjective or emotional experiential aspect of these behavioral patterns. The mother responding to her newly born infant not only greets it with lively face-to-face smiles, but also she lifts her head with bobbing movements, raises her eyebrows briefly, and then lowers her head toward the baby, smiling and talking (Eibl-Eibesfeldt 1983). This entire pattern is repeated rhythmically. It is through nonlearned, instinctive ritual *dances* such as these, accompanied with strong emotions, that the mother and infant establish their permanent attachment. Their bonding is an example of an archetypal experience which is sensed as deeply moving whatever our age or culture. In fact, it comes under the category of a numinous experience in the same way as the bonding or wedding ceremony mentioned above. The question comes up as to what is known of the neuro-physiological events accompanying such experiences of the "myth."

THE LEFT CORTEX AND THE CULTURAL CANON: THE RIGHT CORTEX AND FEELING AND INTUITION

The preceding has spoken of the existence of multiple brain systems: one concerned with everyday reality and the other with dreams and other states of emotional involvement. It is important that the human brain is split in two respects. Each hemisphere controls movement and receives information from the opposite side of the body. But, between those regions in the right and in the left brain that are devoted to the relevant sensory and motor functions, there are in humans large association areas whose function has long been obscure but whose specific role is becoming increasingly clear.

It has been known for a century that Broca's area in the left brain has control over speech (Broca 1861). By its physical nature, speech involves handling information sequentially. By contrast the visuospatial right brain processes holistically, more intuitively and perceptively. As Howard Gardner puts it in a discussion of humor and laterality, patients with right brain damage have difficulty in coming up with the moral of a story (Gardner 1981). Given a specific event, they seem unable to decide whether, or how, the punch line fits into the overall narrative structure. They lack the ability to set up the scaffolding for a story. They cannot relate different parts to each other, integrating them into a coherent whole. Another contribution of the right hemisphere has recently been "teased out" by Elliot Ross (1981). He has demonstrated that the affective components of language encompassing prosody and emotional gesturing are a dominant function of the right side. They can be lost when this hemisphere is affected by a stroke.

According to Jerre Levy, the left is superior to the right in memory for temporary rhythm and pattern; however, the right is more effective in memory for organized or meaningful but nonverbalizable spatial patterns. The left maps sensory input into a temporal domain so that the ordering of events in space is transformed into events in time; the right hemisphere maps sensory input into a spatial domain organizing sequential temporal events as a spatial pattern. Only the left hemisphere can break down a series of words into their phonemes or make a syntactical analysis of a sentence or guide precise sequential manual movements; by contrast, the spatial ordering and the spatial mapping, necessary to represent the exquisite subtleties of the organization of space when an artist paints a face, appears to be a special capacity of the right side of the brain (Levy 1979). It is for this reason that the police use specialists to flesh out the routine verbal descriptions that have reduced the richness of the visual experience to abstract symbolism of language like brown hair, square face, thin lips, protruding forehead. The right hemisphere is deficient in language but in exchange it is superior in understanding the relationship between the real world of space and its representative on a map. The two brains, together, using quite different programs extract more information from the world than could be done by either working alone. The principles of quantum mechanics and the rendering of a great painting like the Mona Lisa require mutually exclusive mechanisms. Together they make up the complex world of human experience (Levy 1979).

The hemispheres do not differ only at the cognitive level. David Bear has studied the difference between left and right temporal-lobe epileptics and concludes that their emotionality differs. Those with a right side disturbance are affective and emotional with an impulsive response style; their attitude is concerned and vigilant. Whereas those with left hemisphere lesions are cognitive and neutral with a reflective response style and an unconcerned attitude (Bear 1983).

As a result of language, the left hemisphere has extensive associations with nonlimbic, that is, visual, auditory, and tactile sensory capacities. This intersensory association system permits one to extract all the *facts* about a significant object such as a snake; regardless of whether one sees, hears, touches, or just perceives the abstract symbol *snake*, one still recognizes the all-important threat. This cross-modal system sacrifices the spatial representation of the right hemisphere.

Contrasting with the affects of the right hemisphere such as euphoria, sadness, aggressivity, and sexual behavior, the emotionality of the left temporal lobe as shown by someone with an epileptic focus includes more executive-agentic aspects, that is, religiosity, philosophic interest, sense of personal destiny, paranoid concerns, and hypergraphia (Bear 1983).

Steven Shearer and Don Tucker make the same point in their discussion of the differential cognitive contributions of the cerebral hemispheres in the modulation of emotional arousal. The two hemispheres contribute differently to the emotional processes (Shearer & Tucker 1981). The left hemisphere's tendency towards analytic ideation and its sequential mode of processing provide a highly structured and controlled form of cognition that can be utilized in emotional inhibition. On the other hand, the right hemisphere's analogue form of information representation and its global holistic form of conceptual organization explain why it appears to lead in the subtleties of expression of feeling. Showing a series of emotionally arousing slides to students they found that analytic and verbal ideation was most often used when they attempted to inhibit arousal, while global and imaginal thinking was used when they sought to facilitate emotion. In a comprehensive review of the neurologic evidence for hemispheric asymmetry of the expression of positive and negative emotion, Harold Sackeim et al. conclude that destructive lesions result in disinhibition of contralateral regions regulating emotional experience (Sackeim et al. 1982). The left side of the brain typically responds with positive emotion, that is, laughing and a euphoric mood, whereas the right side tends toward the negative emotions of crying and depression.

In a comment on this sad hemisphere and happy hemisphere dichotomy, Marcel Kinsbourne makes a perceptive evolutionary ethological analysis of the finding (Kinsbourne 1981). The fundamental decision an organism must make with respect to a challenging phenomenon or object is whether to approach it or to withdraw—"fight or flight." In the human as in other animals *approach* represents a plan of action: a wish, a positive attitude, or a general acceptance of the situation as it exists. It is a positive and direct action indifferent to what else is around. It is the expression of the fight hormone norepinephrine as the organism seeks to gain control. By contrast, *withdrawal* is a function of the right hemisphere. It is concerned with the overall picture how situations and conditions relate to one another. It is essentially negative in tone and expresses itself in terms of self-denial and fear.

Approach is towards a point: hence the left hemisphere seeks out a succession of isolated specific details. It represents the eager, fighting activation of the ergotropic, sympathetic adrenal medullary system with release of norepinephrine: a positive, rewarding addictive substance. It is pleasant and often rewarding to attack. By contrast withdrawal is into a space. It questions the present course of action and seeks for other ways to go. As the conservation-withdrawal response, it is associated with depression and activation of the pituitary-adrenal cortical axis with release of the adrenal corticotrophic hormones. Just

as accurate cognition depends on meshing the two hemispheres, says Kinsbourne, so does a balanced emotional reaction to a situation. One hemisphere evaluates the pros and the other the cons. Integrating these separate contributions produces balanced healthy states of both thinking and feeling. Victor Denenberg has reviewed the extensive evidence that this difference between the hemispheres is not a recent evolutionary acquisition peculiar to humans or even to primates. Rodents and birds show it as well (Denenberg 1983).

What of the mechanisms for integrating these systems? The next section will briefly describe some new observations showing how the most basic regions in the hindbrain are involved in what used to be considered the prerogative of the most recently evolved cortical structures. The basic stuff of consciousness extends to the regions once thought to be the reflex "machine room" of the brain, only concerned with the automatic control of the heart and lungs and other vital physiological functions.

BRAINSTEM CONTROL OF THE PATTERNING OF EMOTION

The locus coeruleus has been the focus of intense neurobiological study for the past decade. It is located in the heart of the brainstem reticular formation. This tiny group of cells, deep in the primitive pontine region we share with the fishes, has turned out to be the source of the extensive sympathetic influence of the neurotransmitter norepinephrine. Nerve fibers emanating from this region exert control over the entire brain including the most recently developed regions of the neocortex. The influence of this region on dreaming sleep, on anxiety and general arousal, and its involvement in emotion have made it a crucial focus of the pharmacological efforts of biological psychiatry. As Gary Aston-Jones, Stephen L. Foote, and Floyd E. Bloom comment in a current review of the physiology and function of the central noradrenergic nervous system: "More is known anatomically, physiologically and clinically about this particular norepinephrine-neuronal system than any other in the brain." Reviewing the extensive literature they came to a new hypothesis concerning the function of this critical region at the base of the brain (Aston-Jones, Foote & Bloom 1983, 92).

They point out that the ubiquity of the efferent fiber system indicates that in this location, relatively few neurones exert global influence over widely disparate central processes. The sharp behavioral effects of drugs influencing the nucleus indicate a pervasive role for the catecholamine hormone norepinephrine. They find that the discharge has a regular synchrony indicating that the neurones function as a

group. They see this as suggesting a special discrete function for the neurotransmitter in brain and behavioral processes. The effect of these cells on target cells, increasing and decreasing information flow in specific channels, suggests that the locus coeruleus system of outgoing fibers coordinates activities in many brain areas.

Inputs to the locus consist of excitation from the perception of external stimuli and inhibition from signals arising within the organism concerning internal housekeeping. The level of discharge appears to reflect the relative demand of the external environment and internal perceptions. Here it is critical that one process closely linked to locus coeruleus activity involves dreaming sleep: for one way of viewing paradoxical sleep is as a period when archetypal material, that is, genetically programmed, emotionally charged mythic symbols, convey messages from the right hemisphere to the more outer-world oriented left (Henry & Stephens 1977). This is a process specially sensitive to the set of the locus coeruleus.

Aston-Jones, Foote, and Bloom see the locus coeruleus as a gating device that in response to appropriate input does one of two things. Either it turns on brain processes needed for coping with immediate exigencies in the outer world (this suggests Jung's extraversion involving the set of the organism in coping with challenge [Jung 1933]) or by switching into the opposite mode the locus turns off these coping responses and enables the development of endogenously generated brain programs such as meditation, grooming, and dreaming sleep. Using myths, dreams point towards the welfare of the organism as it seeks to adapt to the environment: witness the hungry person's dreams of food, the prisoner's dreams of freedom, and so on. In effect the locus coeruleus provides a mode of introversion in the behavioral sense used by Jung (Aston-Jones, Foote & Bloom 1983). In addition, in this setting there is parasympathetic plus modified pituitary adrenal cortical activity. This appears to be equivalent to the trophotropic pole of the ergotropic-trophotropic axis of physiologists W. Hess (1957) and E. Gellhorn and W. Keily (1972). To sum up, in their hypothesis of locus coeruleus function, Aston-Jones, Foote, and Bloom suggest that it "may bias the global orientation of behavior between external and internal environment" (Aston-Jones, Foote & Bloom 1983, 111).

Very close to the locus coeruleus another physically unimpressive part of the reticular formation has come under increasing scrutiny during the last decades. The so-called raphe, both median and dorsal, have been studied from the viewpoint of influence over another major neurotransmitter system. Serotonin is linked to this region by many strands of evidence including a strong influence on the crucial pyramidal cells of the hippocampus. J. O'Keefe and L. Nadel were the first to

see that the hippocampus, which represents truly primitive cortex, serves as a comparator. It contains a stored representation of the environment, that is, a map against which the animal can match its present position and so find out where it must go to find a crucial location such as food or its nest (O'Keefe & Nadel 1978). The sensing of a mismatch generates distress and an effort to improve the situation. In socially oriented animals like humans, position in the social hierarchy may be sensed as well as physical location. Since the ACTH-corticosterone mechanism is closely linked with the same hippocampal elements, the latter region serves as a connection linking the pituitary-adrenal cortical axis with the serotonin mechanism and the raphe. Hence, with the loss of social status there is release of corticosterone and distress (Henry & Stephens 1977, Coe et al. 1978).

Difficult work with the intensely athletic tree shrew has successfully telemetered the activity of neurones in the brainstem's dorsal raphe during a crucial contest to determine social status. The observations Hartung Walletschek and Achim Raab (1982) have made of pairs in conflict for dominance during limited confrontations is confirmed by the work of M. McGuire, M. Raleigh, and C. Johnson (1983) who have shown an increase of plasma serotonin in dominant monkeys. Despite marked sympathetic arousal, that is, locus coeruleus activation during the offensive behavior, an eventually dominant animal that successfully defends its territory shows no nearby raphe-cell arousal. In fact, just prior to attack when the offensive animal is sizing up his opponent, the activity of the dorsal raphe neurones actually decreases $P < 0.02$. On the other hand the defeated animal shows great arousal of these same neurones.

This region close to the locus coeruleus, deep in the pontine brainstem, is thus gating another behaviorally basic variable: in addition to the animal's perception of control, the raphe determines whether the perception is of dominance and continued control or of subordination and the need to observe new rules of behavior (Henry & Stephens 1977, Henry & Meehan 1981, Henry 1982, Henry 1983).

Neal Miller (1980) has described the elegant experiments of his associate Jay Weiss (1972) using two yoked rats, which receive an identical electric shock to their tails but have different behavioral possibilities. The basic psychological fact that emerged was that the crucial variable to an animal is the sense of control. It is this that the organism, rat or human, seeks in the struggle for desired goals be they food, harborage, or mate. This struggle typically involves sympathetic arousal. On the other hand arousal of the adrenal cortical system is associated with the opposite perception of loss of control. This involves

helplessness and is associated with subjective distress, the release of ACTH and corticosterone, the unlearning of old behaviors, and the preparation to learn new ones. These are the characteristics of subordination. The opposite of this depression is yet another emotion—euphoria or ecstasy. This can be expected in connection with an activated locus coeruleus but a suppressed median raphe, that is, with a successful effort to control. Victory leads to high norepinephrine and incidentally testosterone and high serotonin, but to low adrenal corticoids.

The activity of both the above deep brainstem regions, particularly of the locus coeruleus, is strongly affected by the monoamine oxidase inhibitors. They not only interfere with the paradoxical or rapid eye motion of dreaming, but they also cause anorgasmia both in men and women (Kupfer & Bowers, Jr. 1972, Shen & Sata 1983). The occurrence of phantom orgasm in the dreams of paraplegic men and women supports the opinion that orgasm is not a purely peripheral event but that it is a central nervous phenomenon (Money 1961). Its disappearance with the use of these drugs acting on the locus and raphe areas in the pontine region (drugs that reduce the content of norepinephrine and 5-OH-tryptamine or serotonin) suggests that the physiological aspects of sexual ecstasy may depend on these regions—regions that in turn are strongly linked to the temporal lobes which can supply the more differentiated psychic aspects of bonding.

Insofar as the fundamental aspect of religious experience, as viewed from the approach of Otto, is a subjective experience of the numinous, it may well involve not merely limbic regions below the cortex in the temporal lobes but may reach deeper to the brainstem roots of consciousness (Otto [1923] 1952). If the pontine region is the point of origin of the sense of control and, as Aston-Jones et al. propose, is responsible for the diversion of attention either inwards or outwards, if it is the locus of origin of the initiation of dreams, and if dreams and sexual ecstasy are eliminated by the same monoamine oxidase inhibitors (Kupfer & Bowers, Jr. 1972), then it may be that the archetype-laden dream process and the equally archetypally arousing events of adult bonding both involve these primitive regions in the central nervous system: regions formerly thought to be confined to physiological reflex controls with no relationship to consciousness. The philosophical implication is that brain and consciousness are intimately intertwined and mutually inextricable. As Jung remarked when faced with this conceptual possibility, "If one could locate such a basic fact as the *self* at all, the brainstem would be the most likely spot." "I am not surprised that the *highest* would also be associated with the *lowest*" (personal communication).

THE CEREBRAL COMMISSURES AS LINKS BETWEEN THE DIFFERING EMOTIONALITIES OF THE HEMISPHERES

The preceding section indicated that there are switching neurotransmitter mechanisms in the brainstem which divert attention from the extraverted mode needed to deal with external challenge to introverted concern with the archetypal forms of emotional responses and internal welfare. David Galin, considering the problem of combining the activities of specialized left and right cerebral hemispheres, suggests that in everyday life we act as though the left were in control (Galin 1974). There is a clear parallel between the functions of the isolated right hemisphere and those mental processes that in everyday social life are repressed, unconscious, and unable to directly control behavior (Galin 1974; 1976). Indeed, Galin suggests that one reason why commissurotomy patients appear so normal to casual observation is because the activities of daily life do not demand much integration of the left's control and analytic thought with the holistic functioning of the right.

A further factor giving an appearance of unity is the lifelong requirement imposed by society that each of us should behave as if we were a unity. We are addressed as a single person and are legally responsible and identified with our bodies as a unity (Galin 1974). One could argue that this social attitude supports the dominant system of the left hemisphere in its lack of concern about the so-called *minor* system. Galin suggests that, nevertheless, the mental processes in the right hemisphere may still enjoy a life of their own, using experiences that are not easily translated into words (Galin 1976). Howard Shevrin and Scott Dickman have recently argued that the classic psychological unconscious of the psychoanalyst is not just an assumption necessary for the analyst's special studies. The idea of complex psychological processes operating outside awareness is now seriously considered by experimental psychologists as well. Experimentation in selective attention, subliminal perception, and binocular rivalry has resulted in data supporting the idea. The authors conclude that, just as behavior cannot be understood without taking conscious experience into account, so too conscious experience cannot be understood without taking unconscious psychological processes into account (Shevrin & Dickman 1980).

Even if there is repression in normal intact people, the unconscious ideation of the right hemisphere may still be expressed through dreams or daydreams or, as Jung called it, *active imagination* (Jung 1966). Dreams frequently involve nonverbal image presentations, non-syllogistic logic, and violations of ordinary temporal programming. Persons awakened during activated sleep find it associated with visual imagery and give a detailed narrative sequencing of the events. These

types of response are attributed to the right temporal lobe. By contrast, slow-wave sleep dreams characteristically involve verbal discussion but without detailed recall and may stem from the left hemisphere (Galín 1974). Galín discussed the data of M. D. Austin who studied *convergers* who do well on ordinary IQ tests but poorly in tests requiring mental fluency and imagination. He contrasted these potential physical scientists with *divergers* who do better in tests needing imagination and who find art more to their taste. Reporting on temperament, he found those who would do better as scientists had a general inhibition or repression of the emotional and nonrational. They were better at secondary than at primary processes thinking, that is, with the speciality of the hemisphere that works directly with the task at hand (Austin 1971).

This is further evidence that different personality types preferentially utilize different hemispheric capacities and that personality style may be able to alter the usual balance of hemispheric activation in regard to certain cognitive activities. For example, I. A. Smokler and Shevrin, using measurements of direction of spontaneous eye movement (which point toward the hemisphere opposite to that activating them) showed that hysterical subjects were more left looking, that is, right hemisphere dependent, than obsessive compulsives (Smokler & Shevrin 1979). As noted above, the weight of evidence shows that the left hemisphere is associated with control and euphoria and the right with pessimism and lack of hope (Bear 1983, Sackeim et al. 1982). Thus, despite our overall sense of being single individuals, there are different systems in the brain responding differently to the same situations.

In his study entitled "Toward a Psychobiology of Transcendence: God in the Brain," Arnold Mandell (1980) has supported Bear's conclusion that epileptic patients with left temporal lobe disorder tend to paranoid ruminations and antisocial behavior (Bear 1983). The neurobiological substrate for the obsessional—fearful, rageful—mental states that characterize the left temporal lobe appears to be dopamine regulated and to involve the amygdala.

As noted above, those with right hemisphere activation show a tendency to ecstasy and pleasant behavior. It is thought this may be the result of *kindling*, which is a gradual change in the response of adjacent structures due to repeated triggering from the spike potentials generated in an epileptic focus. As a result of this changed responsiveness, which persists during the periods between seizures, these right-side affected people frequently have feelings of bliss and their minds are unusually clear. They may experience periods of relaxed harmony whose intensity can sometimes reach levels of ecstasy. They may have days and weeks of such afterdischarge during which they experience euphoria and their behavior is gentle. Their bias is towards an optimis-

tic attitude, denying negative possibilities and feelings. The mood is similar to spontaneously occurring transcendent mystical experience. Mandell comments that the healing effect of such positive states on the behavior of borderline patients is well recognized (Mandell 1980).

Mandell connects their pleasurable state with the serotonin regulation which comes from the median raphe nucleus and comments that hippocampal-septal slow waves are associated with transcendent consciousness. However he observes that, while improving personality and inducing insightful empathy, the right temporal arousal reduces the normal human urge to bond with others as a source of instinctual pleasure and there is diminished sexuality. This suggests that right-sided activation is associated with detachment from objects of desire—pointing to a possible neurological substrate for the Eastern metaphysical statement about the incompatibility of rage and desire with transcendent consciousness (Mandell 1980). The role of the pontine region's locus coeruleus and raphe in inducing an alternation between the hemispheres appropriate for the behavioral needs of the organism has been mentioned above (Aston-Jones, Foot & Bloom 1983). It would appear that the more *cognitive and elaborated aspects of religious experience* are associated with the temporal lobes. The left is associated with ideational traits such as a sense of powerful forces influencing one's personal destiny—paranoia, humorlessness, conscientiousness, and religiosity with intense self-scrutiny. As noted, these traits may explode into amygdala-driven rage and aggressive behavior. The right shows emotional arousability, dependence on others, that is, emotional involvements and transcendent consciousness. In sum, left temporal epileptics are identified with control and with intellectual and moral contemplation, and right temporal with changes in attachment and affective drive or behavior (Bear 1983, Sackeim et al. 1982, Smokler & Shevrin 1979).

The role of the brainstem in providing an appropriate ringing of the changes and balance between these two sets of emotionally toned cognitive responses and the question whether the more profound, generalized, and hard to describe mystical aspects such as ecstasy involve deep brainstem, that is, pontine, structures remain undetermined. On the other hand, there is increasing experimental evidence that the corpus callosum permits the healthy organism to achieve individuation and experience a fluent balance of responses. In 1977, Klaus Hoppe and J. E. Bogen reported on the profound extent to which commissurotomized patients had an alexithymic difficulty with the proper use of words for emotions (Hoppe & Bogen 1977a; 1977b). Recently they have extended their observations and confirmed the patient's considerable trouble with recalling dreams and their strongly

alexithymic traits, that is, their classic difficulty in discussing their own emotions (TenHouten, Hoppe, Bogen & Walters 1985).

Recapitulating: Berger (1967) and Burhoe (1979; 1984) both see religion as combining everyday experience with strongly emotional events that have profound impact as described by Otto's ([1923] 1952) study of the Holy and sacred or numinous. Otto describes inner experiences which are not only the same as those involved in the intense emotional arousal of life and death events but which are also felt when the temporal lobe has been affected by an epileptic focus (Bear 1983, Sackeim et al. 1982, Mandell 1980). This suggests that numinous experience is involved with the activity of these regions in the brain. The situation is, however, very complex. For there are clearly a left and a right temporal lobe, each with its limbic system structures. It has been shown that the two hemispheres give rise to different flavors of religious experience: religiosity in one and emotional involvement with the other (Bear 1983, Mandell 1980). Nor are these the only types of experiences of which the organism is capable. As Sperry (1983) points out, there is no reason to limit awareness to certain higher regions of the brain. There are well-known hypothalamic structures where the drives for hunger and thirst and where rage can be elicited by stimulation. Awareness of a still more basic type may persist at deeper levels. The relation of dreams and possibly of sexual ecstasy to the pontine region was mentioned above. Tumors of the pontine region are also known to be associated with outbursts of inappropriate laughter or crying, and the speeding up or slowing down of the sense of time has been reported (Canter & Drew 1965). It is conceivable that the ineffable, nameless Nothing, the "not this" and "not that" of states of profound ecstasy and mystical experience that the philosopher of religion Stace discusses in *Time and Eternity* (1952), depend on involvement of pontine structures. Certainly, the profound importance of these regions in controlling consciousness as it alternates under control of the sleep mechanism is well recognized (Aston-Jones, Foote & Bloom 1983).

In 1977 we described the sociobiological aspects of stress, health, and the social environment from the viewpoint of recent discoveries in neurobiology (Henry & Stephens 1977); and we discussed the significance of these observations in terms of archetypal psychology in a comment on a stimulating paper by Ernest Rossi (Henry 1977). In it he had proposed a relationship between Jung's extraversion and the activity of the left hemisphere and introversion and that of the right (Rossi 1977). The work of d'Aquili (1983), as summarized in his recent biogenetic structural analysis of the myth-ritual complex, that is, archetypes, and Barbara Lex's "Neurological Bases of Revitalization

Movements" (1979) have been published recently in *Zygon*. All three approaches to the problem of the brain mechanisms underlying religious experience arrive at similar conclusions; and they see the main issues of the roles of the two hemispheres and the agentic or driving function of the ergotropic, sympathetic system in the same way. The present paper differs by not placing emphasis on the physiological division of the sympathetic/parasympathetic into Hess's and Gellhorn's ergotropic and trophotropic (Hess 1957, Gellhorn & Keily 1972). The amygdalar sympathetic adrenal medullary/hippocampal pituitary-adrenal cortical axes dichotomy, which has been presented in previous work (Henry & Stephens 1977, Henry 1977, Henry & Meehan 1982, Henry 1982, Henry 1983) and in Mandell's observations of the roles of serotonin and the hippocampal septal regions in his study of transcendence and "God in the Brain" (1980), appears more behaviorally significant. The current paper also proposes the phylogenetically most ancient levels of MacLean's triune brain—the locus coeruleus and raphe of the pontine region—as the possible region of origin of the inexpressible mystical experiences of unity. Overall, there is an encouraging parallel interpretation of current neurobiology in the all-important matters of hemispheric differentiation and of the sympathetic ergotropic system as the source of the organism's drive for control of the environment.

The varieties of religious experience are in part determined by the particular brain regions involved. The importance of the continued activity of the huge cerebral commissure in keeping our differently organized brains in step with each other is critical for Berger's integration of the everyday world of the left hemisphere with the archetypes and mythic feelings connected with the right (Berger 1967; 1974): this integration is involved in the more cognitive aspects of religious experience, that is, in the perception of the numinous archetypes of gods and goddesses (Bolen 1984). However, for our vague intuition of "process," of the Positive and Negative Divine, of Stace's "eternity" as opposed to "time" (Stace 1952), or of the God or Tao of the citation from Jung's commentary with which this paper opens, we may have to recognize a role for the brainstem itself.

Attention will now be paid to the effect on the religious process of a failure of the integrating machinery due to damage of the central nervous system by psychic trauma.

ALEXITHYMIA: DISSOCIATION OF THE HEMISPHERES AND THE THEOLOGIAN'S PROBLEMS OF EVIL

Henry Krystal has eloquently summarized the evidence that adult as well as infantile trauma can have profound effects on the brain, causing

permanent changes. Convincing data comes from the histories of victims of concentration camps during World War II. The several thousand Norwegians and Danes who were finally repatriated have left us a particularly well documented legacy. Despite the best medical care their advanced societies could provide during the succeeding years, these men never recovered neurologically or psychologically but showed permanent signs of organic brain damage (Krystal 1978). Krystal studied the question of mechanisms and his conclusions are illuminating. Starting from a psychoanalytic approach, he arrived at the same conclusions as the psychologist M. E. P. Seligman, who saw those overcome by despair and faced by overwhelming danger as becoming victims of "helplessness" (Seligman 1975). Working in the physiological laboratory, R. M. Sapolsky has recently demonstrated the death of hippocampal cells of animals severely stressed—to the point of helplessness. He presents evidence that increased adrenal hormone levels are responsible (Sapolsky, Drew & McEwen 1984). It is suspected by Krystal that the same mechanisms that are at work in the adult are acting in the infant who runs into parenting difficulties. He describes the feelings of "deadness and the depersonalization" that the victims of torture experience (Lex 1979, Henry & Meehan 1981, Krystal 1978, Krystal 1979, Krystal 1982). A recent report indicates that such victims show cerebral atrophy (Jensen et al. 1982); and there is an increased incidence of psychosomatic disorders including peptic ulcers and arthritis, especially in the younger survivors. The final psychic effect of trauma is a pattern of accepting the defeated, inferior position: that of complete subordination (Krystal 1978; 1979; 1982).

Stuart Shipko, William Alvarez, and Nicholas Noviello (1983) have studied combat Viet Nam veterans with posttraumatic stress disorder. They wondered whether these men suffered from alexithymic disturbance of perception and expression of emotion. They found that 41 percent, instead of the expected 8 percent in a comparable sample from the general population, were having difficulty in expressing emotion. Several could identify the episode which was associated with its suppression. Commonly there had been a desperate effort to continue fighting in a threatening situation. The problem was that when the trauma had ended the condition persisted, and years later they still could not experience the appropriate feelings such as grief upon the death of a parent or joy at the birth of a child. The authors comment that all of us who participate in society must on occasion stifle emotion to carry out a task. The problem of alexithymia following trauma is that often, when it is long sustained, this suppressive mechanism can no longer be reversed.

Evidence has been presented above that the emotions characteristic of the left hemisphere activation differ from the right. Further, the

high social conformity of the alexithymic is associated with a remarkable impoverishment of the capacity to make symbolically significant fantasies. For example, studies of Louise Demers-Desrosiers have shown that alexithymic patients cannot weave symbolically suggestive material like a sword, fire, a devouring monster, a refuge, and water into a coherent story that integrates them into a picture (Demers-Desrosiers 1982, Demers-Desrosiers et al. 1983).

To Jung, such myth making and use of archetypal material lies at the basis of the religious experience (Jung 1938). Insofar as religion seeks to integrate "everyday life" with the profoundly moving "other," its very existence depends upon the active and creative use of symbols and archetypes we cited. It is Berger's view that a critical function of religion is this connection of everyday reality of life with a more or less intensely numinous emotional experience of the "other." He illustrates ordinary life with the image of "sitting and/or moving about in a well-lit house with familiar fellows in an atmosphere of warm security." Religious experience takes place in the emotionally arousing "scary night" outside. Religions also provide "churches" where the "other" can be experienced in controlled ritual situations. Even ordinary houses can have little shrines with ornaments or candles, creating a religious atmosphere, as found in the oriental culture or devout Catholic home. By these means, the "otherness" of religious experience is literally domesticated (Berger 1974).

From the viewpoint of the sociologist of religion, alexithymia may be seen as a failure of left-right brain communication. For to Berger, a failure in the religious sphere means a failure to link the capacity to experience symbols, myths, fantasies, and emotional insights to the everyday world of the left. In terms of this explanation of the condition, it can be seen why alexithymics present such major difficulties for the clergy and for psychotherapists (Krystal 1979). As Graeme Taylor points out, in comparison with neurotic patients they are noncommunicative—failing to express themselves in fantasy, feelings, or dreams. Indeed, some will even use language to talk themselves out of the development of the relatedness so necessary for the attachment, positive transference, and bonding that normally goes on in a healthy human society. A similar nonsymbolic communicative style has been observed in many patients with narcissistic personality disorders. Furthermore, many who abuse substances such as alcohol, as well as the obsessive-compulsive Type A personality vulnerable to coronary heart disease, show these characteristics (Taylor 1984). There is an almost deliberate cutting off from the subtle effects of perception of symbolic archetypal material. These conditions are the psychiatrist's borderline states whose more effective treatment with biofeedback rather than psychotherapy William Rickles has reviewed (1981).

Alexander Lowen has written a book on narcissism in which he concludes that it is a condition of great prevalence in modern society. It is one in which love, family, and community are less valued than power, status, and success. Narcissists, he says, deny feelings that contradict the image they seek. They act without feeling, tending to be seductive and manipulative. There is a lack of solid sense of self and a loss of human values. Borderline and psychopathic personalities have similar problems (Lowen 1983).

In his *People of the Lie*, the psychiatrist-theologian Scott Peck sees the denial of loving attachment and an exaggerated need for control as the root of what the psychiatrist will call *narcissism*; he recognizes it as *evil* (Peck 1983). Stanton Samenow's *Inside the Criminal Mind* comes to much the same conclusion, describing them as psychopaths who value people only to the extent that they can be manipulated. They see themselves as entitled to the power and control that they desire (Samenow 1984). This viewpoint would indicate an alexithymic lack of communication with the symbol systems or archetypes whose locus is in the right hemisphere: the ensuing difficulties with attachment behavior and bonding, not unexpectedly leading to their serious problems in the social sphere.

Arnold Toynbee comments that, with the development of successful technology, civilized humanity has progressively more and more ignored the "gods and goddesses." Primitive humans seek to maintain the order of nonhuman nature by performing rites that meet the needs of the myths, feelings, and archetypal systems of which the right hemisphere is so aware. The theory that would follow from the above is that civilization achieves so successful a control that it falls into narcissistic loss of concern for the feelings and emotions (Toynbee 1972). Alexithymia develops in part as a result of the demand for ever greater environmental and emotional control. (Even thunder and lightning and the cycles of the sun and moon are lost sight of in today's air-conditioned buildings.)

An established religion, be it secular or supernatural, attempts to preserve the everyday realities of our perennial hunt for desiderata (food, water, harborage for family) while at the same time it harnesses the archetype-based myth as a device for solving life's problems. (The imaginative free-association of prayer and meditation is one way in which we listen to the mythic wisdom of the "other.") Long experience has taught the necessity of using myth and ritual to keep the right distance from the overpowering effects of raw emotions such as rage, fear, and the erotic. Whether a particular system of beliefs emphasizes the supernatural, or is secular and plays it down, is not as critical to its social value as balance and intuitive appreciation and respect for the

facts of human nature. Its role is to support its members in the stresses imposed by the everyday life of their society.

On the lintel of his home, Jung had carved in Latin the Delphic Oracle's enigmatic: "Summoned and not summoned God will be there." In this context Berger has commented on our society's increasing secularization and disregard of oracles, saying that "the myths that guide life spring from the soil of religious faith. Their power comes from those realms of the mind in which the gods used to dwell, and the gods have always been relentless" (Berger 1976).

In a recent discussion entitled "Is/Ought: A Risky Relationship Between Theology and Science," theologian Philip Hefner cites sociobiologist Edward Wilson's reference to an "oracle" that resides in the deep, emotional centers of the brain. Says Hefner, "The *is*, which the sociobiologist examines, possesses within itself a very profound dimension of *ought*. The evolutionary record itself exhibits the *oughts* which have been chosen in the past" (Hefner 1980, 381). Today's challenge is to combine the inborn, archetypal oughts of our hunter-gatherer limbic systems with the new everyday-life oughts of a space-traveling world technocracy.

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