

## THE NEUROPSYCHOLOGY OF AESTHETIC, SPIRITUAL, AND MYSTICAL STATES

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*Abstract.* An analysis of the underlying neurophysiology of aesthetics and religious experience allows for the development of an Aesthetic-Religious Continuum. This continuum pertains to the variety of creative and spiritual experiences available to human beings. This may also lead to an understanding of the neurophysiological mechanism underlying both "positive" and "negative" aesthetics. An analysis of this continuum allows for the ability to understand the neurophenomenological aspects of a variety of human experiences ranging from relatively simple aesthetic experiences to profound spiritual and unitary states such as those obtained during meditation. However, it may be possible through a neuropsychological analysis to determine the similarities that exist across such experiences. Thus, certain parts of the brain may be functioning in similar ways during different experiences. It may be the case that the specific neuropsychological components of a given experience may depend on the strength of the affectual response of the person and the ability to mark such experiences as significant. Further, even though similar structures may be functioning during different experiences, their inhibitory and excitatory interactions may be different. Finally, by considering the Aesthetic-Religious Continuum, we may eventually arrive at a better understanding of how we experience and define reality.

*Keywords:* aesthetics; mysticism; neuropsychology; religion; spirituality.

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Friedrich Nietzsche, following the ancient Greek model, divided aesthetics into a kind of positive aesthetics, which he called Apollonian, and a negative aesthetics, which he called Dionysian (Nietzsche 1994). Apollonian aesthetics represents what is usually considered the aesthetics of beauty and light. It comprises a sense of wholeness and harmony and is affectively marked by a sense of pleasantness, at the very least, and often a sense of joy or elation. Dionysian aesthetics, on the other hand, named after the myth of Dionysius, who is torn apart alive by the Bacchae, is marked by a sense of fragmentation, disharmony, death, or dying, and is affectively marked by sadness and melancholy, at least, and often by a sense of fundamental hopelessness, futility, and even terror.

Basing their ideas on those of ancient philosophers, the medieval scholastics defined the essential characteristics of positive aesthetics as (1) *Integritas*, or wholeness, (2) *Consonantia Partium*, or harmony of parts, and (3) *Claritas Formae*, or a radiance of form (Eco 1988). Thus, for a work of art to have a positive aesthetic, the medievals required that it generate an overall sense of wholeness and a sense of harmony of its composite parts. The radiance or clarity of form seems to have referred to the emotional effect on human beings, which should be at the very least pleasant and hopefully edifying and joyful.

The medieval scholastics were hesitant to deal with negative aesthetics, since, in their view, negative aesthetics were diabolical, while positive aesthetics were from God. Nevertheless, because they followed the ancients, they did summarily treat negative aesthetics. To a great extent, although not completely, the defining characteristics of negative aesthetics were considered to be the opposites of those defining positive aesthetics. They were: (1) *Integritas in Fragmentatione*, or wholeness in fragmentation, (2) *Dissonantia Partium*, or disharmony of parts, and (3) *Tenebra Formae*, or darkness of form. It is interesting that, if the defining characteristics of negative aesthetics were simply the opposite of the defining characteristics of positive aesthetics, then the first characteristic of negative aesthetics should be *Fragmentatio*, or fragmentation, pure and simple. But the medievals insisted that, for a work of art to be a work of art, however diabolical, and not simply a rendering of the horror of human life, there had to be some sense of wholeness or integrity even if the subject matter itself was fragmented. Thus, for a medieval aesthetician, and probably for an ancient one as well, *Guernica* and *Waiting for Godot* are works of art at least because they are defined spatially and temporally, by a frame in the case of *Guernica* and by the production time and temporal sequencing in the case of *Waiting for Godot*. The medievals would probably maintain that the use of words, and possibly of sentences, and the delimitation of formal elements within a painting contribute to the formal wholeness in spite of the fragmentation of overall subject matter. So much for the criterion of wholeness within fragmentation. The other two characteristics of negative aesthetics for the

scholastic are simply the opposites of the second and third characteristics of positive aesthetics. By this we mean a disharmony of parts and a darkness of form. As in the case of *Claritas Formae*, *Tenebra Formae* also describes the emotional response to a work of negative aesthetics, that is, sadness, futility, hopelessness, and horror.

Throughout most of human history, positive or Apollonian aesthetics have tended to be synonymous with aesthetics in general. Of course, there have been counterexamples, particularly among the Greeks and Romans. But even among them, Apollonian aesthetics tended to define beauty. It is only in the twentieth century, particularly in the West, that the negative aesthetic has come into its own. With the weakening of religious belief systems in the West, the existential sense of a futile, empty, and hopeless world has provided the ground for negative or Dionysian aesthetics to become a dominant manifestation of art. But whether art is Dionysian or Apollonian, it appears that, one way or another, a sense of wholeness is to some extent essential for aesthetic appreciation. The crucial importance of this, and how it relates to religious experience, will become more obvious as we examine the neuropsychology of the Aesthetic-Religious Continuum.

#### THE NEUROPSYCHOLOGY OF THE AESTHETIC-RELIGIOUS CONTINUUM

To understand the neuropsychology underlying both aesthetics and religious experience, we must first review some background material concerning primary epistemic or knowing states. We have previously defined nine primary epistemic or knowing states (d'Aquili 1982). Of these, six relate to a world of multiple discrete reality, while the other three relate to Absolute Unitary Being (AUB), which is a state, usually arising out of profound meditation, in which there is no perception or awareness of discrete beings and no perception of space or time and in which even the self-other dichotomy is obliterated (d'Aquili and Newberg 1993a). In our analysis of the neuropsychology of aesthetics, and in our preliminary analysis of the neuropsychology of religious states, we are concerned only with the six primary epistemic states that deal with multiple discrete reality.

Of these six states, three are inherently unstable, involving irregular relationships between the elements of discrete reality often caused by drugs or various forms of psychosis or dementia. For the purposes of this paper we will examine only the three stable states involving the perception of multiple discrete reality and regular relationships between elements of that reality. The first such state is characterized by neutral affect. We have called this "baseline reality," and it is presumably the reality that comprises our everyday perceptions and behaviors. The second primary epistemic state that will be of concern to us is "multiple discrete reality," with regular relationships suffused with positive affect. This is similar to the state that

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Richard M. Bucke (1961) called Cosmic Consciousness. The third primary epistemic state involving multiple discrete reality and regular relationships is suffused by negative affect and has been called *Weltschmerz*.

Let us take a few moments to look at these states in more detail. The first of these states, the baseline state, involves the perception of discrete entities comprising the world that are related to each other in regular and predictable ways. The affective valence of this world perception is neutral. This is the state that most of us are in at this moment; for example, most of us are quite certain of the reality of the furniture and people surrounding us. Few if any of us would question the fundamental reality of the state we are in. It is precisely because this state appears certainly real while one is in it that it is a primary epistemic state. Furthermore, most individuals would consider this state as the *only* reality or the *only* valid epistemic state. Nevertheless, the fact is that this sense of reality is not unique; two other stable perceptions of discrete reality are also primary. These other two states are similar to the state most of us are in most of the time in that the regularities of time, space, and causality are the same, and there is the perception of the same discrete entities in the world. They differ from baseline reality only in affective valence, positive or negative, as opposed to neutral, which usually suffuses the perception of the world.

The second primary epistemic state or “sense of reality” involves the same discrete entities and regularities as the ordinary baseline state, but it also involves an elated sense of well-being and joy, in which the universe is perceived to be fundamentally good and all its parts are sensed to be related in a unified whole. In this state one usually has a sense of purposefulness to the universe and to one’s place in the universe. This sense of purposefulness may defy logic and certainly does not arise from logic; nonetheless, it is a primary stable and certain perception. The onset of such an exhilarating view of reality is usually sudden and has been described as a conversion experience. It has been delineated repeatedly in the religious literature of the world. In the psychiatric literature, it is most carefully described by Bucke (1961) in a remarkable book entitled *Cosmic Consciousness*. Since its publication in 1901 this book has undergone some twenty-two editions, the latest in 1969. Bucke had this experience himself, and in his magnum opus he presents evidence of similar experiences in the lives of many people, including the Buddha, Socrates, Saint Paul, Francis Bacon, Blaise Pascal, Baruch Spinoza, and William Blake, as well as many of his own contemporaries.

A third primary sense of reality is also a very stable one. It is like the first two in that it deals with the world of multiple discrete being and has the same high degree of regularity of causal, spatial, and temporal relationships. It differs from the first two in that the basic affective valence toward the perceived universe is profoundly negative. It has been called *Weltschmerz* in the psychiatric literature and consists of a sense of exquisite sadness and

futility, as well as a sense of the incredible smallness of human beings in the universe, the inevitable existential pain generated by being in the world, and the suffering inherent in the human condition. Usually, there is the perception of the whole universe as one vast pointless machine without purpose or meaning. In its full-blown form, it is similar to Cosmic Consciousness in that it usually occurs with a suddenness that leaves the individual totally perplexed. The individual experiences a profound sense of loss and meaninglessness in relation to the world that rarely leaves. It is the basic sense of reality that appears to underlie much existentialist thought, particularly in French existentialist literature. It is the sort of perception in which the universe is apprehended not as neutral but as essentially absurd, and often suicide is thought to be the only truly human response.

It seems that the primary epistemic states that we have considered actually make up a spectrum or continuum of unitary states in which the sense of unity increasingly transcends the sense of diversity. At one end of this unitary continuum, close to baseline reality, is the experience of positive or Apollonian aesthetics. The sense of wholeness, or *Integritas*, is greater than the diversity of parts. It seems that this is true in the appreciation of a sunset or a symphony. We postulated (d'Aquili and Newberg 1993a, 1993b) that the posterior superior parietal lobule (PSPL) and certain parts of the inferior parietal lobule, particularly on the nondominant side, are involved in the imposing of greater unity over diversity. Thus, as one moves along the unitary continuum with progressively greater experience of unity over diversity, one moves out of the realm of aesthetics and into a realm that more properly would be described as religious experience. A transitional phase between aesthetic and religious experience may be romantic love, which might be characterized by the phrase, "It is bigger than the both of us." As one moves up this continuum, one moves through the experience of numinosity, or religious awe, into Bucke's state of Cosmic Consciousness, properly so-called. As one continues along this spectrum beyond Cosmic Consciousness, one moves into various trance states in which there is a progressive blurring of the boundaries between entities until one finally moves into Absolute Unitary Being (AUB). As soon as one moves into AUB, one is in another primary epistemic state. This is because AUB is characterized by absolute unity. There are no longer any discrete entities that relate to each other. The boundaries of entities within the world disappear, and even the self-other dichotomy is totally obliterated. In AUB there is no extension of space or duration of time. If this state is suffused with positive affect, it is interpreted, after the fact, as the experience of God, or the *Unio Mystica*. If it is suffused with neutral affect, it is experienced nonpersonally as the Void, or Nirvana, of Buddhism. We postulated that moving up this continuum was at least partially due to progressive deafferentation of (or blocking neural input to) the posterior superior parietal lobe and possibly adjacent areas of the brain (d'Aquili and Newberg

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1993a; 1993b). We proposed that total deafferentation resulted in the total and absolute unitary experience of AUB.

In testing our hypothesis that progressive deafferentation of the posterior superior parietal lobe and parts of the inferior parietal lobe, particularly on the nondominant side, was responsible for a progressive increase in unitary experience as we go up the Aesthetic-Religious Continuum, we were gratified to find that single photon emission computed tomography brain imaging of accomplished Tibetan Buddhist meditators yielded results compatible with deafferentation in these areas during profound unitary states (Newberg, Alavi, Baime, Mozley, and d'Aquili 1997). However, we still must perform additional brain imaging studies to clearly delineate whether each point along the Aesthetic-Religious Continuum is marked by progressive deafferentation of these areas, culminating in total deafferentation during AUB. Thus, the evidence is suggestive that positive or Apollonian aesthetics represents the beginning of the Aesthetic-Religious Continuum along which various spiritual and mystical experiences are placed, culminating in either the experience of God or of the Buddhist Void.

#### NEGATIVE OR DIONYSIAN AESTHETICS

Although some of the mechanism of the Apollonian aesthetic and its relationship to spiritual and mystical experiences remains speculative, we are accumulating increasing evidence regarding the specific aspects of that neurophysiological mechanism. The same cannot be said of Dionysian aesthetics. Here we have fragmentation associated with some degree of wholeness. As with the medieval analysis, so with the neuropsychological analysis that the Dionysian is not simply the opposite of the Apollonian. Senses of unity may arise from the progressive deafferentation of the posterior superior parietal lobe. The blocking of input into this brain structure may result in a decreased sense of self and other, a decreased sense of space and time, and an overall sense of unity among discrete objects. Fragmentation, on the other hand, may result from an increased input into the posterior superior parietal lobe—the opposite of deafferentation. Thus, the posterior superior parietal lobe and certain adjacent structures in the inferior parietal lobe on the nondominant side may become hyperexcited and overloaded with input. The inability to process and modulate all this input may result in the subjective sensation of fragmentation, hopelessness, and fundamental disorder to the universe, resulting paradoxically in a sense of emptiness and futility which seems to be inherent in the universe.

The problem with Dionysian aesthetics is that, at the same time that negativity and fragmentation exist in a work of art, certain wholeness or integrity must exist simultaneously in order for the work to be experienced precisely as art. The only speculation as to how this might come about neurophysiologically is that, at the same time as there is hyperstimulation

of the PSPL on the nondominant side, there is some degree of deafferentation in the homologous PSPL on the dominant side. We have postulated that the involvement of the PSPL on both sides occurs in certain mystical states (d'Aquili and Newberg 1993a; 1993b), so this mechanism is not absurd. Whether it is, in fact, what occurs has yet to be seen. Further studies and analyses will be required in order to more fully elucidate the mechanism underlying Dionysian aesthetics.

We have focused on the aesthetic end of the Aesthetic-Religious Continuum thus far. Now let us turn to some considerations at the religious experience end.

#### SPIRITUAL AND MYSTICAL STATES

We postulate that all spiritual and mystical states, at least those that have a powerful affective component, are located somewhere along a continuum that we have called the Aesthetic-Religious Continuum. These states, whether they are transitory experiences or more permanent states, occupy a place on what is probably, more or less, the second half of the Aesthetic-Religious Continuum. We admit that we have not done an exhaustive typology of unitary states. It is possible that the spiritual-mystical part of the continuum may be considerably more than half or considerably less than half of the spectrum, which begins with aesthetic experiences, moves through experiences of romantic love, and then enters lower-level spiritual-mystical states. In this section we will consider these latter states only. This upper end of the Aesthetic-Religious Continuum more or less begins with experiences of religious awe, such as the sort of states that occur in some individuals when confronted with the beauty and majesty of nature. With this lower-level mystical experience of religious awe we should probably include various numinous experiences, such as mandala dreams. One can then move up the continuum to the level of Cosmic Consciousness, as described by Bucke (1961). In this state, there is no alteration in the perceived characteristics of the world. However, there is the profound sense (which people in this state would call "knowledge") that the world is fundamentally one, in its essence, and is profoundly good. This is "known" to be the case even in the presence of profound evil and suffering in the world. We must reiterate that Cosmic Consciousness is not a philosophical stance, although it may be turned into one. The unity and goodness of all reality is simply known to be the case anterior to any philosophy or science. One then moves along the continuum into various trance states in which the contents of the sensorium are to a lesser or greater extent distorted or modified with reference to baseline reality. The perception of space and time can be significantly distorted during these trance states (d'Aquili and Newberg 1993a; 1993b). Likewise, it is along this part of the Aesthetic-Religious Continuum that archetypes are often activated sometimes associated with

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remarkable hyperlucid hallucinations. Here we use the word *hallucination* in its basic sense, that is, a sensory experience that cannot be checked in baseline reality. There is no implication either of reality or nonreality. As one moves along the continuum through progressively more profound trance states with progressively more tenuous boundaries between entities in the world and between the self and the world, one eventually moves into Absolute Unitary Being. As already mentioned, this is the absolute unitary state where self and other are obliterated, where all entities and their interrelationships are obliterated, and where space and time are obliterated.

Let us now look at how these various spiritual-mystical states are characterized. The spiritual-mystical states, like all the states along the Aesthetic-Religious Continuum, can be ordered according to an experienced sense of greater unity over diversity. We have proposed that this progression of an increasing sense of unity can be neurophysiologically related to progressive deafferentation of the posterior superior parietal lobe and adjacent parts of the inferior parietal lobule, particularly on the nondominant side. Although, in our model, the progressive unitary sense is the most important defining characteristic of spiritual-mystical states and the dimension by which various mystical states can be most rationally seen to relate to each other, there are, nevertheless, three other defining characteristics of spiritual-mystical states. As with the unitary sense, these characteristics also seem to increase in intensity as one moves up the continuum towards AUB. The first of these three defining characteristics beyond the progressive unitary sense is the sense of transcendence, or otherworldliness. Actually a vague sense of transcendence seems to increase as one moves up the continuum, gradually developing into a true otherworldly feeling. At present, it is unknown what is the neuroanatomical and neurophysiological substrate for the subjective sense of familiarity and its opposite, unfamiliarity or strangeness. Whatever mechanism this may turn out to be, some modification of it undoubtedly underlies the sense of transcendence. Certainly, what one experiences as one moves up the continuum is clearly strange when compared to baseline reality.

A second defining characteristic of spiritual-mystical experiences beyond the fundamental unitary sense is the progressive incorporation of the sense of the observing self in each successive experience or state. As with aesthetic experiences, in spiritual-mystical experiences there must be a harmonious ordering of the parts or elements of the experience. We have postulated that the underlying neural network of this harmonious ordering of parts must involve the frontal lobes, the temporal lobes, and the inferior parietal lobe (d'Aquili and Newberg 1993a; 1993b). The inferior parietal lobe especially must be correlated with the harmony, because it is responsible for the sense of gradation, comparison, and opposition (Joseph 1990). What is noteworthy here is not only a harmony of parts but that one of the parts is the observing self. The incorporation of the sense of the observing self,

to one degree or another, is essential to most spiritual-mystical states. It is by no means essential either to aesthetic experiences or to aesthetic productions. When there is an incorporation of the observing self to some extent in an aesthetic experience, however, the experience is much more powerful. Indeed, contemporary artistic productions often explicitly attempt to involve the observer. Although involvement of the observer in the content of a work of art tends to generate a more powerful aesthetic experience, particularly in theatrical productions, such involvement is not inherent in a work of art being a work of art, nor is it essential for an aesthetic experience. However, it *is* essential for most spiritual-mystical experiences. The whole point of most spiritual-mystical experiences is for the self to have a sense of being fundamentally and essentially related to some aspect of whatever ultimate reality might be.

One's involvement in the spiritual experience or state is progressively greater as one moves up the continuum. As one moves into AUB, the self seems to expand to become the totality of reality without individualized content. This is compatible with the Hindu interpretation and probably underlies Shankara's observation that the Atman (or soul) and the Brahman (or God) are one.

The Christian *Unio Mystica* is phenomenologically the same, although care is taken by Christian theologians who reflect on this state to preserve the ontological independence of the soul. They would agree that in this state the union of God and the individual soul is so perfect and so complete that an observer, if such were possible, could not perceive where one ended and the other began. Nevertheless, for theological reasons, Christian mystical theologians maintain the ontological integrity of the individual, although they would concede that the individual has, as it were, expanded to a perfect and a simple union with God. One often hears it said that in profound mystical experiences such as AUB the self becomes as a drop of water in the ocean of reality. What actually appears to happen is that the self, far from being a drop of water in an ocean, actually expands to become the totality of reality. When Europeans first came into contact with certain Hindu sects, they were shocked and scandalized when they learned that part of ritual worship required the repeated assertion "I am God, I am God, I am God." What confused the Europeans was that the "I" in the statement did not refer to the individual conscious ego with all its evil proclivities but rather to the self or Atman, the deepest unconscious core reality of an individual. It is in this sense that every individual can truly state "I am God," because each individual can potentially expand into a state of AUB. A Hindu who states "I am God" is all the while perfectly aware of the shortcomings and failings of his conscious ego in day-to-day life. No religious tradition that we are aware of has ever advocated that an individual proclaim "I am God" where the "I" would refer to

the conscious ego. That would indeed be blasphemy. Not only that; it would be absurd.

The third defining characteristic of spiritual-mystical experiences beyond the unitary sense is the intense and progressive certainty as one moves up the unitary continuum of the objective reality of the mystical experiences (d'Aquili and Newberg 1993a; 1993b). A good example of this is the relatively common near-death experience (NDE). This occurs in the area along the unitary continuum that we have called trance states. In its complete form, which is not too common in our society, the NDE appears to consist of the sequential constellation of two archetypes, what we have called the Archetype of Dissolution followed by the Archetype of Transcendent Integration (Newberg and d'Aquili 1994). The first consists of hellish experience involving torture, dismemberment, and other terrifying horrors. Often demons are involved, and the experience is described as Hell by individuals whose religious tradition incorporates a concept of Hell. In fact, we would suggest that, in the evolution of religious phenomenology, the concept of Hell may be derived from this terrifying experience. If allowed to take its course, the Archetype of Dissolution is followed by the Archetype of Transcendent Integration. This is the aspect of the near-death experience that is described in present-day literature (Moody 1975; Ring 1980). It involves the experience of moving through a tunnel, often emerging in a breathtakingly beautiful landscape. The individual is frequently met by deceased relatives or friends and, in some cultures, by saints or gods. This is usually followed by an encounter with a Being of Light and a rapid life review within the context of being totally and completely loved. Subjects recount that what is especially upsetting is reviewing their own acts of selfishness or cruelty within the context of being unconditionally loved. At this point, the individual either decides or is informed that he or she must return to his or her body. This sequence of two archetypes, one terrifying beyond belief and the second involving a sort of celestial exaltation, joy, and love, together seem to form the complete near-death experience.

Description of these biphasic "other-world journeys" are described in Western medieval spiritual literature and in the literature of other cultures as well (Zaleski 1987). This is especially true in the Tibetan Book of the Dead, where the horrible and demonic chonyid state is described as a prelude to a state remarkably similar to the Archetype of Transcendent Integration (Freemantle and Trungpa 1987). The hellish Archetype of Dissolution has been described in our culture enough that we know it certainly exists. Why the great majority of individuals in our culture who have a near-death experience have only, or remember only, the Archetype of Transcendent Integration is not known. We have speculated upon this in another work (Newberg and d'Aquili 1994). What is important here, however, is that almost all individuals who have had complete core experi-

ences, especially involving the realm of light and the life review, are absolutely certain of the objective reality of their experience. This is true not only among uneducated persons but also among the most educated philosophers and scientists. This is apparently true among neuroscientists as well. After reviewing many reports of core near-death experiences we have been able to find only one instance of a neuroscientist maintaining a tentative and somewhat skeptical stance after his experience. Furthermore, the tone of his reservations was muted and agnostic, allowing for the possibility of some sort of objective reality.

We do not claim to have made an exhaustive study, but all other scientists and philosophers, as well as ordinary individuals, and including a number of neuroscientists, seem to maintain a quiet certainty of some sort of objective reality to their near-death experience. Furthermore, people who have had the core NDE appear to no longer fear death (Ring 1980). And the lives of near-death experiencers are nearly always dramatically changed in the direction of increased altruism and a generally more benevolent attitude toward family, friends, and indeed the world. Many of those who came out of a religious tradition return to it, but many do not. These experiences and their consequences in the lives of the near-death experiencers are indeed amazing and have generated a number of studies by sociologists interested in the social effects of the change in the lives of these individuals.

It is interesting that almost all of the near-death experiencers are not eager to proselytize, and they are not upset when they are not believed. When we discussed his NDE with a neuroscientist, he readily conceded that there may be neural correlates to the experience. He stated, however, that there are neural correlates to everyday experience, and this did not make him doubt the existence of the external world.

We have considered the near-death experience because it is relatively common and well reported. The certainty of the objective reality of mystical experiences at the upper end of the Aesthetic-Religious Continuum is just as great and possibly greater than the certainty of the reality of the near-death experience. Individuals who have experienced AUB seem to be uniformly absolutely certain that they have been in contact with ultimate reality, however that may be subsequently interpreted in terms of their specific religious traditions. The certainty of the objective reality of that state seems to be absolute.

We have described the defining characteristics of mystical or spiritual experiences as: (1) progressive increase of unity over diversity, (2) progressive sense of transcendence or otherworldliness, (3) progressive incorporation of the observing self in the experience or state, and (4) progressive increase of certainty in the objective existence of what was experienced in the spiritual-mystical state. This approaches absolute certainty especially for those states high on the unitary continuum involving hyperlucid experiences.

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## REALITY AND PHENOMENOLOGY

All this leaves us with the interesting situation of what might be called superior and inferior realities with respect to baseline. For example, certain states may be considered inferior in that, when they are recalled from the baseline state, they are not perceived to be real. Examples such as dreams and psychoses, while they may be considered real while a person is in them, are almost always considered not to be real when the dreamer awakens or the psychotic person returns to the baseline state after being treated with certain medications. The individual may state, "That was just a dream," or, "I was crazy then, before I took my medications." However, there are a number of states, particularly hyperlucid experiences, that are considered *more* real than baseline reality even when they are recalled in baseline reality. We have already presented the near-death experience as a fairly common example of one such state. What are we to make of non-psychotic individuals calmly asserting that certain altered states of consciousness represent an objective reality more certainly real than the reality presented in baseline consciousness? And what do we mean when we say that something is "real" in any case?

In a previous work, we systematically demonstrated that the various criteria by which we judge something to be "real" can be reduced in one way or another to only one criterion, and that is the vivid sense that something is real (d'Aquili and Newberg 1998). This vivid sense has been called the *phantasia catalyptica* by the stoics and *Anwesenheit* by certain modern German philosophers. It is what Dr. Samuel Johnson referred to when disputing Bishop Berkeley's idealism. While discussing this with his friends, Dr. Johnson is said to have explained, "I answer Bishop Berkeley thus." With this he kicked with great force a stone that happened to be beside the path on which they were walking. This is known as the "sore toe" school of epistemology. Nevertheless, the stone had a compelling presence, as do the people, furniture, buildings, and so on with which we interact in baseline reality. We will not go into this issue in detail here. Suffice it to say reality seems to consist fundamentally only of the vivid sense of reality, or, as some would say, reality is constituted by compelling presences. If this can systematically be shown to be true, and we believe that we have done so, then spiritual or mystical states of reality recalled in the baseline state as more certainly representing an objective condition than what is represented in the sensorium of the baseline state must be considered real. There can be no other conclusion no matter how one comes at it. This may present many problems that must be worked out, but the essential or underlying reality of hyperlucid experiences must be said to be real or the word *reality* has no meaning whatsoever. It is such considerations that put us, even against our will, in the presence of what Rudolph Otto called the *mysterium tremendum et fascinans*—the tremendous and spellbinding mystery.

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REFERENCES

- Bucke, Richard M. 1961. *Cosmic Consciousness*. Secaucus, N.J.: Citadel Press.
- d'Aquili, Eugene G. 1982. "Senses of Reality in Science and Religion." *Zygon: Journal of Religion and Science* 17 (December): 361-84.
- d'Aquili, Eugene G., and Andrew B. Newberg. 1993a. "Mystical States and the Experience of God: A Model of the Neuropsychological Substrate." *Zygon: Journal of Religion and Science* 28 (June): 177-200.
- . 1993b. "Liminality, Trance, and Unitary States in Ritual and Meditation." *Studia Liturgica* 23:2-34.
- . 1998. "The Neuropsychological Basis of Religion: Or Why God Won't Go Away." *Zygon: Journal of Religion and Science* 33 (June): 187-201.
- Eco, Umberto. 1988. *The Aesthetics of Thomas Aquinas*. Cambridge: Harvard Univ. Press.
- Freemantle, F., and C. Trungpa. 1987. *The Tibetan Book of the Dead, Translation with Commentary*. Boston: Shambhala.
- Joseph, Rhawn. 1990. *Neuropsychology, Neuropsychiatry, and Behavioral Neurology*. New York: Plenum.
- Moody, Raymond A. 1975. *Life After Life*. Atlanta: Mockingbird Books.
- Newberg, Andrew B., A. Alavi, M. Baime, P. D. Mozley, and Eugene G. d'Aquili. 1997. "The Measurement of Cerebral Blood Flow during the Complex Cognitive Task of Meditation Using HMPAO-SPECT Imaging." *Journal of Nuclear Medicine* 38:95.
- Newberg, Andrew B., and Eugene G. d'Aquili. 1994. "The Near Death Experience as Archetype: A Model for 'Prepared' Neurocognitive Processes." *The Anthropology of Consciousness* 5:1-15.
- Nietzsche, Friedrich. 1994. *The Birth of Tragedy: Out of the Spirit of Music*. Ed. M. Tanner. London: Penguin Classics.
- Ring, K. 1980. *Life at Death: A Scientific Investigation of the Near-Death Experience*. New York: Quill.
- Zaleski, C. 1987. *Otherworld Journeys: Accounts of Near-Death Experience in Medieval and Modern Times*. New York: Oxford Univ. Press.