

NEUROSCIENCE IN PURSUIT OF THE HOLY: MYSTICISM, THE BRAIN, AND ULTIMATE REALITY

by Carol Rausch Albright

Abstract. Eugene d'Aquili and Andrew B. Newberg's *The Mystical Mind: Probing the Biology of Religious Experience* presents a core theory regarding the neurophysical nature of mystical experience; extensions of this theory, focusing upon near-death experiences and the nature of religion itself; and buttressing arguments proposing that genetically based neurophysical "operators" within the brain compel human beings to think in certain ways. On the basis of this work, the authors pose a "metatheology," suggesting that certain brain operations may underlie all the religions of the world. The core theory, its extensions, and related arguments are discussed in turn, concluding with commentary on the authors' constructive theology.

Keywords: Absolute Unitary Being (AUB); causation; Eugene d'Aquili; dualism; holism; metatheology; mysticism; myth; neuroscience; Andrew B. Newberg; reductionism; ritual.

Eugene d'Aquili was a visionary, a pioneer, and a stubborn soul, who followed his religious and intellectual calling along a path that was largely untraveled. He sought to explore the physical—and spiritual—bases of mystical experience and the implications of his findings.

As a member of a family that traced its lineage to the proconsuls of the Roman Republic, he was steeped in the intellectual heritage of Italy: the great syntheses of the Italian Renaissance, the echoing vectors of the Roman Catholic tradition. Yet d'Aquili was also an American, trained in medical science, in the workings of the brain, and in theories of psychiatry born in the twentieth century. His stubborn integrity was too great for him to put these lightly aside or to keep the categories conveniently separate.

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Instead, he sought integration of his experience and of his understanding. I believe he pursued a personal theology because he could hardly do otherwise.

In his pursuit of these understandings, d'Aquili seems to have been deeply influenced by the great mystics of Buddhism as well as by Catholic reflections from a variety of eras. Insights from these sources color his thought in significant ways.

A physician himself, Andrew Newberg collaborated with d'Aquili during the final decade or so of Gene's life. Since d'Aquili's death in 1998, Newberg has assumed the weight of their project and has made it his own. Newberg brought the *The Mystical Mind* to completion. His contribution has been so well integrated that the final work appears virtually seamless.

At its core, the book is an exploration of the phenomena of mysticism, as experienced by persons rooted in various cultures, of various religious heritages, and at various eras in the historical record. The authors explore their subject using the resources of history and biography, of various theologies, of psychiatric theory, of their own observation, and of brain research. From this great treasury of work, which clearly extended over decades, they have woven a theory of mysticism—of what goes on in the brain to support intense mystical experiences, about the varieties of such experiences, and about less intense experiences of the mystical genre.

From this core d'Aquili and Newberg have drawn further conclusions and theoretical suggestions. Their most significant endeavor is to use their theory as a basis for constructive theology, about which more later. An interesting extension is the application of their theories of mysticism to near-death experiences as reported across cultures and historical periods.

The authors also develop explanatory theories to elaborate and buttress their central assertions. One concern is to delineate what is meant by *religion*. Not surprisingly, they focus upon a narrow spectrum of religious life, especially ritual, myth, and mystical experience, and they suggest reasons why these features are found in most of the world's religions. *The Mystical Mind* has little to say about the role of interpersonal relationships in religion or individual spiritual growth through time. Indeed, the authors finally conclude that time itself is illusory.

Peripheral to their central argument, but frequently cited, is the concept of "operators"—assemblies of neurological connections that fulfill specific functions. These assemblies are said to be genetically based and present in all normal human beings. Because they are hardwired, they actually *compel* humans to think along certain lines. For example, one "operator" dictates dualistic thinking, and another supports holistic conceptualization; still another leads to reductionism. However, the specifics of their content vary with the individual's cultural heritage and personal history.

It seems appropriate to comment on *The Mystical Mind* in ways suggested by the work of the Hungarian philosopher of science Imre Lakatos, who saw scientific theories as consisting of a "hard core" of central formu-

lations plus a “protective ring” of assertions that are less well established and more open to modification. I will first discuss portions of the work that pertain to its central core, which has to do with the nature of mystical experience itself. Next I will discuss extensions of this core theory and provide some thoughts on the authors’ peripheral assertions, especially those regarding “operators” and the nature of religion. In conclusion, I will discuss some of the theological consequences of the work.

THE MYSTICAL CORE

What happens during mystical experience? It depends. A mystical experience may have overwhelming strength, such that a person who undergoes it emerges with outlook and persona permanently modified. Such events, which the authors call Absolute Unitary Being (AUB) events, are relatively rare, although with practice certain people do become adepts. However, many individuals have quasi-mystical experiences of exaltation and transcendence, and these are not unrelated to the mind-shaking events of AUB.

AUB events themselves are not all alike. They fall into two main categories: those beginning with self-emptying and silence, and those beginning with an active involvement or even frenzied activity, such as Sufi dancing. The authors see these groupings as related to two main response systems within the body, which involve not only the brain but also the peripheral nervous system, the endocrine system, and ultimately heartbeat, respiration, and digestion—all the bodily functions. Responses related to the sympathetic nervous system rev up the body, preparing it to meet a challenge; the parasympathetic system acts in opposition to the sympathetic system, producing quiescence and promoting bodily restoration.

AUB events that begin with activity are commonly linked with Western culture and its outward emphasis. Meditators within this tradition characteristically begin by meditating about something: a silently repeated word, a candle flame, a sound. However, outwardly generated AUB events may also be kindled by such activities as rapid rhythmic movement or intense intellectual or artistic efforts. AUB events that begin with internal quiescence are more commonly linked with Eastern culture and its emphasis on inwardness. Meditators begin by clearing their mind of all content, so as to invite an experience of the infinite. Slow rituals may also promote this state.

In either type of activity, the supporting neurological/physical systems—sympathetic or parasympathetic—may become stimulated to maximum capacity, so that they finally “spill over”; as a result, they may “turn on” the opposing system. Thus, meditation beginning with emptiness may spill over into overwhelming joy; meditation that begins with activity may spill over and lead to a sense of overwhelming peace. Both active joy and enveloping peace may be experienced simultaneously. The descriptions of experience appear to be well documented by reports from mystics from many

traditions and cultures. The supporting neurophysical theories seem cogent and potentially fruitful. Intuitively they feel correct, whether or not all the neurological detail proves out.

In a preliminary study, d'Aquili and Newberg imaged the brains of highly experienced Tibetan Buddhist practitioners during meditation. They found that one part of the brain, an area known to support distinctions between self and not-self, is relatively inactive—"turned off"—during periods of AUB. Conversely, areas involved in deep concentration were "turned on" (p. 119). As the authors were well aware, however, more elaborate research is needed to investigate their theory in greater detail.

NEAR-DEATH EXPERIENCES

As has been widely reported, persons who return from the brink of death report unusual experiences that are remarkably similar, among individuals and even across cultures. These have been variously interpreted—as foretastes of eternal salvation (or damnation), as effects of anoxia, or as recollections of the birth experience, for example. People who emerge from extremely life-threatening situations—being caught in an avalanche or tumbling down a cliff—report somewhat similar mental states. Persons who were physiologically at the brink of death may report a terrifying experience of hellish threat, which may be followed by a trip down a dark tunnel, at the end of which they encounter a wholly benevolent "being of light," may comprehend their life as a whole or encounter loved ones who have died, and finally return to earthly life. The hellish part of the experience is usually absent in persons who endured dangerous situations but whose bodies were not moribund. Along with many who return from the brink of physical death, they usually report only a "heavenly" experience. In records of near-death experiences from earlier centuries, hellish episodes are reported more widely. The authors attribute these variations in reports to both cultural and physical variables. Perhaps, they say, hellfire was preached more frequently in the past than it is today, and so dying persons thought of it more often. Or perhaps present-day subjects suppress these memories and report only the good. Or the actual physical dissolution of near-death may trigger mental images of torture and suffering. In any case, the cascade of neurological phenomena probably runs parallel to that in persons involved in AUB. Like veterans of AUB, near-death survivors are changed persons. They usually evidence greater altruism and less fear of death.

Although these assertions are suggestive and intriguing, I found them less carefully developed and convincing than the authors' theories about AUB. As d'Aquili and Newberg were well aware, it would be nearly impossible to gather observational data to support their speculations about near-death experiences.

RELIGIOUS EXPERIENCE

In their considerations of religion and religious experience, d'Aquili and Newberg focus mainly upon AUB itself, the less-intense experiences of transcendence, and the rituals that trigger such experiences. The authors tend to see religious doctrines as myths that flow from mystical experiences and purport to explain them. Even in persons whose experiences of transcendence are slight, the doctrines thus gain a degree of validation. Religious rituals promote quasi-mystical states of exaltation and transcendence. These assertions, though somewhat narrow, deserve their place in studies of religion. And, as d'Aquili and Newberg observe, ritual is indeed a powerful technology—fruitful not only in religious observance but in stirring up excitement at gatherings ranging from college football games to Nazi rallies. For good or ill, ritual can lead to a sense of oneness with something larger than oneself and promote a sense of control over the contingencies of life (see Rappaport 1992).

However, many scholars of religion see some other features as equally central. For example, some Christians see faith as a means to forgiveness of sin. Others speak of its value in providing a meaning for one's life and a sense of orientation in a world full of options (see Ashbrook 1992; Ashbrook and Albright 1997). Some, such as James Fowler ([1981] 1995), emphasize religion's role in fostering personal and spiritual growth. Religious naturalist Jerome Stone¹ believes "religious traditions may suggest (1) a regulative ideal, (2) a specificity to moral demands, (3) motive or empowerment, and (4) an analogue to forgiveness and a sense of value beyond morality" (Stone forthcoming). Other scholars, including Ralph Wendell Burhoe (1986), see religion as humanity's key means to transmit wisdom for effective living, a process selected through biocultural evolution.

One striking feature of d'Aquili and Newberg's image of religion is its emphasis on the static, the everlasting. The core experience of religion as they see it is union with an unchanging ultimate being. They believe, in fact, that "the innermost consciousness of human beings is identical to the absolute and ultimate reality of the universe, known variously as Brahma, Tao, fathagata, Christ, dharmakaya, Allah, the Godhead, or absolute mind" (p. 152). While a focus on the everlasting is seen in this conviction, it is evidenced also by what is *omitted* from their theory, as noted above. Although d'Aquili and Newberg do allude briefly to religion as a means to self-maintenance and self-transformation (drawing on insights of Ward Goodenough [1999]), the allusions are not developed.

OPERATORS

Although d'Aquili and Newberg's theory of "operators" is not central to their core observations about mystical experience, they rely heavily on these concepts as they theorize about the related neurological events. Basically

they postulate that within the brain there are genetically programmed sub-assemblies, assemblies, and super-assemblies of neurons that carry out specific sorts of operations (p. 51). Because these operators are genetically based, people *must* think along certain preprogrammed lines. In other words, human beings cannot help but think in certain ways because the operators force them to do so. These operators are (1) the holistic operator; (2) the reductionist operator; (3) the causal operator; (4) the abstractive operator; (5) the binary operator; (6) the quantitative operator; and (7) the emotional value operator. (Note that all but the last of these operators deal with cognition [p. 52].)

Because we have these genetically specified operators, the authors say, we *must* think both holistically and reductionistically. We must abstract from phenomena to symbols, think dualistically, quantify, and evaluate through emotional means. We are compelled to believe that a cause exists for every phenomenon, and so we make one up if cause and effect are not apparent. For this reason, the authors assert, people *must* search for an ultimate cause for the cosmos and postulate a first cause, a god, to explain why there is something rather than nothing (p. 54).

The authors seem to have derived this list of operators inductively, by observing individuals and theorizing about central human identity. Of course, most psychiatrically based theories of human nature have been derived in much the same way; to say the theory of operators seems mainly inductive is not to say that it is invalid. It is true that the authors cite some neuroscientific observations in support of their schema; many of these references date from the 1960s and 1970s, but newer studies in support might well be located. And so, finally, like other theories, the theory of operators must be evaluated in light of how well it fits the data and can advance the project.

Some postulated operators may be on firmer ground than others and may drive behavior more inexorably. For example, the human tendency to look for cause and effect has obvious survival value: understanding causation helps us control our environment. Although anthropological evidence is sparse in this account, searching for cause and effect seems nearly universal among human beings. And so a strong case may be made for a genetically based causal operator.

That binary thinking is universal seems less strongly supported. The authors suggest that a key role of religious myth and ritual is to create the sense that opposites are unified, melded into one. It might have been better to base the argument on work other than the structural anthropology of Claude Lévi-Strauss (1963) and his cohort, because this approach is currently out of fashion in the social science community.

The key question, though, is whether any prewired operator can *force* us to think in a predetermined way. Can we not choose to leave the first cause of the cosmos an open question or to think in categories more numerous than two? Must we think dualistically about good and evil, objective and subjective?

A longer list of operators might be suggested. For example, there may be operators that equip people to deal with the passage of time (even if time is only an illusion, as the authors suggest). For example, a “narrative operator” might motivate people to construct narratives so as to order and explain their personal life history and the history of their family, clan, or nation. A “scenario operator” might motivate people to think ahead, consider outcomes, and set goals. There is in fact some evidence that ritual has a role in helping people organize their sense of time (see Rappaport 1992).

Individuals are situated in communities and must be so, for survival’s sake. The authors acknowledge the significance of “attachment behavior.” Could there be a “bonding operator” that promotes attachments of various sorts? Many philosophers of religion see self-in-community as a central religious concern. In contrast, the authors apparently believe the religious quest is basically pursued by one person at a time, each in relative isolation. As we will see, their concluding “metatheology” depends upon this assumption.

Despite these reservations, the idea of operators seems generally quite fruitful. There is good evidence that the brain is wired in assemblies and combinations of assemblies. The authors’ conclusion that intelligence results from “well-organized wiring” of the central nervous system rings true. Complex systems are those with large networks of significant connections, and the human brain has been described as the most complex system, for its size, that we know of in the universe. Even though much evidence indicates that the human brain is a partially nondeterministic system that can self-organize in response to the environment and to personal choices, it apparently does develop assemblies much like the postulated operators, and *along lines* that are genetically driven.

THEOLOGY

It should come as no surprise that *The Mystical Mind* gives rise to a theology that focuses upon mystical states and transcendent experience, supported by ritual and giving rise to myth. This genre of theological work has a long and distinguished history in more than one tradition; d’Aquili and Newberg carry it further and buttress it creatively with psychiatric and neuroscientific research and theories. Indeed, they suggest that theirs is a “metatheology”—a biologically based approach to theology that underlies the world’s various religions. Thus, they make a distinguished contribution to the lineage of which they form a part.

In order to make such progress, the authors bring some fresh insights to bear upon the mind/body problem. They claim that “the classical philosophical problem of subjectivity versus objectivity is only a problem because the mind/brain, under ordinary conditions, insists on processing reality in this manner” (p. 178). While Western thought has generally seen external reality as primary and subjective reality as secondary, the authors

believe that this approach leads to awkward, perhaps insuperable, explanatory gaps. For if externality comes first, then they see two great discontinuities: (1) the question of why there is something rather than nothing, and (2) “an unexplainable jump from material organization to a level of reality of another order,” namely, the order of consciousness (p. 186). If, on the other hand, subjective awareness is seen as primary, then they see no discontinuities (p. 187).

But perhaps we need not decide which is primary. During states of AUB, reality is perceived as neither subjective nor objective: “AUB or pure awareness seems to be anterior to either subject or object” (p. 188). And so, “as counterintuitive as it may seem, such an approach requires that both individual subjective awareness and external material reality must derive from pure awareness” (p. 189). Time and duration are not realities; far from being absolutes, they “derive their perceived qualities from brain function” (p. 191). Thus, the authors conclude, “we are satisfied that each and every criterion of the reality of entities collapses into the first, namely, the subjective vivid sense of reality” (p. 191), also known as AUB or pure awareness.

So, the authors ask, is God created by the brain, or the brain by God? If external reality (including the brain itself) is primary, then “the concept and experience of God, and all religious phenomenology, are generated by the brain and nervous system.” If subjective consciousness is primary, then “God (absolute unitary being or pure consciousness) generates the world (including the brain) and subjective experience itself.” D’Aquili and Newberg choose not to make such a choice. Instead, they say, “both conclusions about God (AUB) are in a profound and fundamental sense true—namely that God is created by the world (the brain and the rest of the central nervous system) and that the world is created by God” (p. 193).

This, finally, may be the conclusion of one who spent his years in pursuit of the Holy. In the case of Eugene d’Aquili, perhaps the Holy has now found him.

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