

PUTTING THE MYSTICAL MIND TOGETHER

by Andrew B. Newberg

Abstract. This article reviews and responds to various issues that have been raised in critical analysis of our work studying the relationship between religion and the brain. An adequate response necessitates a discussion about the origins of this research, the potential pitfalls of doing empirical research in this field, and the complex requirements of interpreting the implications of such an approach. Through inquiry such as this, the study of the brain and its relation to religion and religious experience will continue to advance and uncover the many fascinating questions that await.

Keywords: mysticism; neuroimaging; neurophysiology; neurotheology; religious experience.

The year 1993 marked a turning point in my life, because it coincided with the publication of the first paper that Eugene d'Aquili and I coauthored. This article represented the first step toward the publication of our book, *The Mystical Mind: Probing the Biology of Religious Experience* (1999) and our most recent book, *Why God Won't Go Away: Brain Science and the Biology of Belief* (2001). With the publication of our comprehensive neuropsychological model of mystical and religious experiences in 1993, we developed a framework that could be tested, expanded, and eventually applied to the broad topic of religion and religious experience. However, our goal was not only to develop as detailed a theory as possible but also to explore all of the implications for theology, philosophy, and the sciences. Through this research we came to realize how important it will be to find the best method of integrating the religious perspective and the scientific perspective of reality in order to uncover the true nature of our universe and how we relate to it.

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To accomplish this, we have proceeded along several lines of research, which are elaborated in both of our recent books. The first is to develop the best neuropsychological model of religious and spiritual experiences. This requires a thorough review of the existing literature to determine how the brain functions and to explore the varieties of religious experience to which neuropsychology can be applied. The second is to develop and execute empirical studies to validate the model and to expand and alter the model as necessary. Associated with the empirical neurophysiological studies is an analysis of clinical studies of spirituality as it relates to mental and physical health. Finally, the theological and philosophical implications of all of these analyses need to be determined so that the neuroscience can be considered in its broadest context.

The results of this research are published in the two books mentioned above. *The Mystical Mind* has a more academic perspective, and *Why God Won't Go Away* is designed to be more accessible to the general readership. However, as with all scientific inquiries, there is a gradual evolution of the concepts. This is true even of our second book, which, while describing some of the concepts in a more concise and approachable manner, brings in many new developments in the neurosciences, including an expanded reference list of recent brain-imaging studies, and also expands the model and how it applies to myth, ritual, and religious experience. The points made in the first book are generally corroborated in the second, as are the final conclusions, which deal with the issues of reality and the need for integrating science and religion at the nexus of neuroscience. This "neuro-theology" is a topic that has received significant press in recent years extending from the early work of d'Aquili (1972; 1975; 1978) and James Ashbrook (1984) to some of the more recent work by R. Joseph (2000), James Austin (1998), V. S. Ramachandran (1997), Michael Persinger (1993), and others.

The comments in this issue of *Zygon* are greatly appreciated. Any good theory requires ever-persistent analysis and must be able to maintain its integrity as well as be adaptable in order to offer the best possible rendition of reality. I personally appreciate the encouragement to continue to pursue these topics despite the loss of d'Aquili, a great mind and pioneer in this field. Carol Rausch Albright (2001), who has also contributed greatly to the study of spirituality and the brain, describes our theory in terms of its hard-core concepts and its peripheral, protective concepts. She appropriately points out that the theories regarding near-death experiences are less well established, which, as she also mentions, is in large part due to the difficulty of studying these unusual events. There is, however, an ongoing study of such experiences, including the work of Bruce Greyson (1993), Kenneth Ring (1980), and others. It was our hope to show that near-death experiences could be considered from a neuropsychological perspec-

tive that would explain the elaborate nature of these experiences and provide a hypothesis from which future research might proceed.

Albright also adds some detail to the discussion of religious experiences, particularly with respect to other features such as faith, forgiveness, and morality. We have frequently used a powerful and transformative experience, what we have called Absolute Unitary Being (AUB), as a launching point for exploring the full range of religious experiences. To be successful, any model must be able to incorporate both relatively mild religious experiences and the most profound and compelling experiences. The notions that we develop in both of our books look specifically at this framework, from which it is our hope that a tremendous diversity of experiences, within traditions, across traditions, within individuals, and across individuals, can be studied. However, we found it necessary to develop our model by looking at a relatively narrow band of experiences, because to look at the incredible variety initially could result in neuroscience losing its ability to make any kind of definitive statements. Neuroscience seems to work best when selecting a specific function and measuring it in many individuals. Even in our brain-imaging studies of meditators, we found it best to focus initially on one or two particular types of meditation. The results from such an analysis can help to develop the framework upon which future hypotheses and studies can be built. We have not ignored aspects of religious experience such as forgiveness, love, faith, or wisdom; we have only tabled them in order to allow the neuroscience to function in its most successful manner. However, we have already begun to elaborate this model toward some of these other issues, for example a neuropsychological analysis of forgiveness (Newberg 2000). Also, as Albright points out, many other characteristics of religious experience are intimately related to some important points of our theory, including those of self-maintenance and self-transcendence. These issues do have important relevance to many of the nonmystical aspects of religion, which are also extremely important to religion in general.

Albright and others have considered and added to our conceptualization of the cognitive operators. In our later book we make reference to more recent research supporting the biological basis of such operators, but there is little change to the basic concept. Albright raises several intriguing issues regarding these operators, including the compulsion to use them. It appears that our brain is always trying to order and explain the world; we have called this the *cognitive imperative*. The cognitive operators are what guide the brain in its function. Thus, we do not necessarily have to use a specific operator at a given time, but we are always forced to understand our universe in the ways available to us through the brain. Albright makes several suggestions regarding other possible operators, and she is correct that the brain functions in those ways as well as those that we have suggested. However, we have tried to consider operators based on the most

basic functions of the brain. Whether those that Albright mentions are basic functions or combinations of other operators requires further analysis. For example, the “scenario operator” may represent an elaboration of the causal operator, and the “bonding operator” an interpersonal function of the holistic operator (see Albright 2001, 491).

As to the importance of group interactions, much of our discussion of ritual is based on the notion of community and the importance of becoming a part of something greater than the individual. However, for neuroscience to be allowed to explore such phenomena, we must pursue how group interactions ultimately affect the individual and the individual’s brain. Thus, we are somewhat forced to explore religious experience one person at a time, even though the actual pursuit may be singular or as a part of a group.

Regarding the critique by Michael L. Spezio (2001), we would be the first to agree that the original neuroscience references in *The Mystical Mind* were from an earlier time period. This was the result of two forces. One was that we were interested in showing how our neuropsychological model of religious experience developed from the less sophisticated neuroscientific techniques. Much early brain work was done either on animal models or through the study of specific disorders or brain injuries. We felt that it was important to show that even this rudimentary knowledge of the brain still allowed for a relatively extensive theoretical development. Further, some of the “big” questions regarding theology, epistemology, and phenomenology are in many ways immune to the advances of the neurosciences. The second had to do with publishing delays: the book had actually been written between 1996 and 1997, when techniques such as functional magnetic resonance imaging (fMRI) were still in their relatively early development. This is one of the major areas in which our more recent book, *Why God Won’t Go Away*, differs from *The Mystical Mind*. Although not as academic in its presentation, the former has many more recent references that incorporate fMRI, positron emission tomography (PET), and single photon emission computed tomography (SPECT) findings as well as those of Antonio Damasio (1999), Michael Posner (1994), and Michael Gazzaniga (2000). Interestingly, as Spezio points out, much of the newer information has not changed many of the basic concepts. Thus, most of the theory in *The Mystical Mind* remains as accurate, only with more up-to-date references.

As to our particular SPECT data on Tibetan Buddhist meditators as well as Franciscan nuns, we felt that in the books we could not be very technical in terms of the many specific issues and confounding problems inherent in such research. This we took up in presentations of our work at several international meetings and in our paper on the results of the Tibetan Buddhists in the peer reviewed journal, *Psychiatry Research: Neuroimaging* (Newberg 2001). There are certainly many fascinating issues regarding the neuroscientific study of meditative experiences, includ-

ing the technical limitations of various imaging approaches, the best comparison groups, the subjective nature of these experiences, the best statistical analyses, and the best ways of interpreting the results (some of these are mentioned by Spezio). Many of these issues are considered in our paper and are crucial to the future study of such experiences. There is no doubt that we have made some important first steps, steps that would have been impossible only ten years ago. However, we also must acknowledge that there is a tremendous future to such research and that any model of religious or spiritual experiences will necessarily be altered and advanced as more research is performed.

In his analysis of our approach to the neuroscientific study of religious experience, Spezio points out several important aspects relating to the faith we place in both science and religion and to whether our approach is reductionistic or deterministic. Our very starting point—that the brain is the thing that mediates all of our experience—requires us to consider that, whichever way we explain the world, whether it be scientific, religious, philosophical, phenomenological, or otherwise, we must “take on faith” that that interpretation is valid. In other words, we must believe that that perspective represents the “true” reality. This is where the real paradox lies, since even science cannot avoid this problem, and the entire reductionistic and to some extent deterministic (at least from the genetic perspective) approach with which we begin our theory ultimately runs out, and we are left with the need to explore the issue of fundamental reality based solely on the experience of that reality. This, in some ways, is beyond reductionism, beyond determinism, and possibly even beyond science. Because we can only base our analysis on the experience as we describe it—the sense of reality—we must take that sense of reality on faith. This is necessary for us to perform science in the first place, to explore spirituality and religious experience in the second place, and to understand all of reality in the final analysis.

Karl Peters (2001) makes an excellent comparison between a biocultural theology and the neurotheology considered in *The Mystical Mind*. Several issues arise from this comparison regarding neurotheology. One of the main points is whether neurotheology takes into account the cultural evolution that gives rise to myths, rituals, and morals. While much of our work considers the relevance of mystical states from a neuropsychological perspective, we have always been aware of the effects of culture on that neuropsychology. Our initial presentation of this work in our books explored the more general questions about why human beings are so deeply affected by religion and religious experience. The concept of deity and the experience of that deity, in whatever form, whether in everyday experience or mystical states, is crucial and so is considered in detail. However, there are many far-reaching implications for neurotheology that pertain to other

elements of religions, such as morals and faith. Even the concept of religious experience as achieved within a group is developed in our discussion of ritual, but further elaboration is certainly warranted. In fact, one could argue that the basic functions of the brain are what allow for the expression of culture. Gene d'Aquili actually considered these issues in some of his earliest work, for example, in *The Biopsychological Determinants of Culture* (1972). This is not to say that our basic biology and behaviors are not altered by cultural and societal influences, only that we can potentially relate those influences to the neuropsychological processes from which they derive. The issue of morals is something that we did not explore in detail in our two books, but it is certainly an important issue for the future study of neurotheology and will likely have important implications for religious studies.

Peters also addresses the difference between immanence and transcendence and suggests how neurotheology might reconcile the two. We have actually thought that this could be the case, especially when one considers how experiences of AUB often are associated with a creative element from which objective and subjective reality are derived. (For a thorough discussion of this, see d'Aquili and Newberg 1996.) In this case, the transcendent experience is more than just space-time oriented; it is related to a creative and immanent force to which one can respond through religion and religious experience. Thus, we would agree with Peters that the biocultural and the neurotheological perspectives might be complementary to each other, but we would further suggest that neurotheology might be better able to include the biocultural perspective in addition to accounting for the profoundly transcendent experiences. In this way, as Peters comments, we might argue that the neurotheological approach we have put forth may still be more comprehensive, although we may need to include further development from the biocultural perspective in order to allow neurotheology to reach its fullest potential as both a metatheology and a megatheology.

The approach we have taken in our research and in our books attempts to allow the scientific and the spiritual perspectives of reality to enhance, rather than diminish, each other. In our view, this approach can be accessible to those of virtually any religious tradition as well as those of science. To express some of Gene d'Aquili's optimism and vision, it is our profound hope that this approach will provide a framework for people of virtually every perspective to feel secure about their beliefs and about science so that we can enter into a constructive dialogue about the neurological interface between science and religion. It is at this interface that we think we have the best chance of integrating science and religion in such a way as to best comprehend and understand reality and, ultimately, our place within it.

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