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Neurotheology: The Neurobiology of Religious Experience

Stacey Smith

In a nutshell, I will be reviewing the research on the biological processes that occur in the brain during an encounter with beauty or the divine – here, this encounter will be defined as a “mystical experience.” In addition, in this article I examine the reasons for and ways to reconcile the conflicts between theology and neuroscience that are inherently a part of the conversation surrounding neurotheology.

First and foremost, I should address exactly what I mean by the term “neurotheology.” This is a fairly recently-coined term which refers to the neurobiological processes that occur in the brain during experiences with the mystical or the divine. In *Principles of Neurotheology*, Andrew Newberg, one of the pioneers of the field of neurotheology, lists and analyzes all of the things that neurotheology should strive to be and do. One idea that Newberg addresses is the idea that the brain places functional restrictions on all thought processes, and hence how we experience religion, spirituality, and theology.¹ Thus, mystical experience is processed in the same way that all other experiences are processed in the brain. This must mean that mystical experience is as valid as any other type of experience.

Additionally, Newberg points out that every brain structure and function might be considered to be useful in understanding theological and philosophical concepts.² Much in the way that all structures of the brain have a function in understanding other concepts, every structure in the brain is partially responsible for the understanding of theological concepts and mystical experience.

Finally, it is important to understand an overall idea of what neurotheology can be taken to mean. There are many important principles and components of this term, but none are more significant than a general

¹ Andrew Newberg, *Principles of Neurotheology* (Ashgate Publishing Company, 2010), 84.

² Newberg, *Principles of Neurotheology*, 89.

understanding of what the term “neurotheology” means. Neurotheology is the use of the neurosciences – including psychology, biology, and neurology – to understand exactly what it is that composes theological ideas in the mind and the brain.

The neurosciences have demonstrated a number of important ideas about the experience of mysticism and beauty. First, Newberg addresses the idea that neurotheology must be a path or approach to a deeper understanding of the human brain and its associated capacity for responding to religious beliefs and having spiritual experiences.³ Neurotheology is not a field in and of itself. It is merely a lens through which one can view the ideas of neurology or theology as these relate to each other. Neurotheology can both examine the neurological processes that underlay religion and mystical experience, and use people’s mystical experiences to learn and understand the processes that occur in the brain. The concept of neurotheology can work in both directions – understanding theology in terms of neurology, and examining neurology in its relation to theological ideas.

Additionally, we’ll need to talk about the relationship between mysticism and neurobiology as it is expressed in *Where God and Science Meet*, by Patrick McNamara.⁴ One of the articles in this volume addresses neuroimaging studies performed on a number of self-defined religious and non-religious persons. The results of this study indicate two possible conclusions. The first conclusion suggests that Christian religious experience is a cognitively structured phenomenon, meaning that the brain acts as a mediator between what is real and what is perceived. In the case of mystical experience, it would mean that the brain processes the presence of God in a way that becomes understandable to a human being. The other possible conclusion of this study, however, indicates that religious experience may be marked by dysfunctional brain activity involving limbic structures. The limbic structures are the parts of the brain that process emotions and other primitive functions. According to this explanation, the people who experience mystical encounters with the divine are cognitively damaged, and the intensely emotional experiences are nothing more than misfires in the nerve cells that comprise their limbic systems.

Another study, described in *We Are Our Brains*, by D. F. Swaab, offers an explanation that might put to rest the conflict between these two theories of mystical experience. The EEGs of Carmelite nuns showed marked changes during mystical experiences when they felt that they were at one with God.⁵ These changes were consistent and proven across the EEGs of numerous nuns, decreasing the likelihood that mere dysfunction was to blame. Additionally, similar studies, examined in *Where God and Science Meet*, prove changes in the brains of Buddhist monks working toward meditation that are consistent with the

³ 145.

⁴ Patrick McNamara, ed. *Where God and Science Meet: How Brain and Evolutionary Studies Alter Our Understanding of Religion*. (Westport: Praeger Publishers, 2006).

⁵ D. F. Swaab, *We Are Our Brains* (New York: Spiegel & Grau, 2014), 282.

results of the Carmelite nun study. Thus, similar changes have occurred across different faith traditions. It is unreasonable to assume that every person who practices to achieve mystical experience, however that is defined across faith traditions, must be cognitively damaged to the point of misinterpreting and misunderstanding these highly emotional experiences as an experience of the divine.

It is also noteworthy that the strongest common element among all of the religious participants in these studies – the “mystics,” including monks, nuns, and regular people examined in the studies performed on religious and non-religious people – was a compelling conviction that they had risen above material existence, and spiritually united with the absolute.⁶ This idea is a theme even across different faith traditions, signifying that there is something universal about it. If people from numerous different religious traditions all experience something similar, not only in their self-reported and subjective understandings, but also in the neurological way that their brain processes these experiences, then there must be something happening beyond just mere coincidence. It stands to reason, then, that this experience of mysticism is universal, and cannot be taken lightly or minimized as just a dysfunctional limbic system.

The above-mentioned studies were conducted using a number of different methods to evoke mystical encounters with the divine. Some of these were meditation on a religious scripture, an intense focus on a piece of art or a specific prayer, or a complete clearing of the mind of all errant thoughts. Scripture and art were used in these studies as ways of coming into an encounter with God or the divine. Consequently, although this was not the intention, the study’s method established that beauty and art are a bridge to religious experience!⁷ If art and beauty are so powerful that they can lead someone into a deep and meaningful religious encounter, then they should be regarded as religious experience. True beauty can open the mind and soften the heart to a mystical encounter. Beauty is that powerful – that it can lead to a lasting impression of the presence of God.

Now that it is clear that neurotheology can be a two-way bridge to understanding the neurosciences and theology, it is time to examine the other links that exist between the neurosciences and religion.

There are a number of ways that this link between neurosciences and religion can support a methodology for the care of our environment, as it is addressed by Pope Francis in his encyclical *Laudato Si: On Care for Our Common Home*. True beauty, as addressed above, can open the mind and soften the heart to religious experience. This experience, however, should not be limited just to things that can happen in a temple or a prayer alcove. The experience of

⁶ Andrew Newberg and Eugene D’Aquili, *Why God Won’t Go Away: Brain Science and the Biology of Belief* (New York: Ballantine Books, 2001), 102.

⁷ See Cecilia González-Andrieu, *Bridge to Wonder: Art as a Gospel of Beauty*, (Waco: Baylor University Press, 2012).

beauty that can lead to a mystical encounter can come from anywhere, including nature. While a significant encounter with the beauty and presence of God can lead someone into religious fervor, a significant encounter with the beauty of nature can lead a person to inspiration to care for the earth and each of its inhabitants. Understanding the beauty of God can lead to an understanding of the beauty of God’s creation. If we can have mystical encounters with God’s beauty that are evidenced in the biology of our brain function, then this line of reasoning supports the idea that we can have similar neurobiological experiences in relation to the beauty of nature.

Finally, it is important to address the question of how we can foster these lasting and transformative experiences of beauty. Spending time in nature, meditating, and focusing on art and things that may be considered objectively beautiful are all paths to potentially transformative encounters with beauty.

Next, we move on to the complicated problem of the divide between the neurosciences and religion. It should not be news to anyone that there are deep and dividing conflicts between these two fields. We have already seen this in the contradictory explanations for mystical encounters examined in the study on religious and non-religious persons.

In another example, Sister Margareta, a fourteenth-century German nun, reported an encounter with Jesus, following several days of prayer and fasting in preparation for Lent. There is a disagreement as to whether she was really visited by the mystical presence of Jesus, or whether she was the victim of some emotional or psychological imbalance that the science of her time couldn’t fathom, as most modern, rationalistic thinkers would insist.⁸ These are reflections of the two prevailing theories of religious experience – that either they are genuine and valid, as the theologians would insist, or they are merely the result of brain dysfunction, as would be suggested by neuroscientists.

The exclusively scientific understanding of religious experiences has a number of shortcomings. Even though there are theories to suggest that Joan of Arc was merely an epileptic whose visions of Jesus could be explained away by the hallucinations caused by her faulty brain,⁹ there are reasons why religious experience cannot be attributed to mere seizure-induced delusions. First of all, seizure victims can experience a number of seizures throughout the week, or even a day, while those who claim mystical encounters have no more than a few of these throughout their entire life. Additionally, there is a high degree of sensory complexity involved in religious experiences, while epileptics may only experience one or two sensory stimuli during their seizure. Finally, mystics cannot be persuaded that their experience was anything less than the real deal – they have strong convictions regarding the experience – while seizure victims can

⁸ Newberg and D’Aquili, *Why God Won’t Go Away*, 99.

⁹ *Ibid.*, 111.

be convinced that their hallucination was nothing more than that – a hallucination. It is clear that the divides between science and religion are just skepticism, and a hesitation on the part of scientists to believe that there are things that cannot be explained by neurology.

According to Newberg, the successful neurotheologian “should seek to understand the specific nature of the conflict between science and religion, focusing on the nature of the human mind and/or brain as mediating this conflict.”¹⁰ Neurotheologians have an obligation and a responsibility to examine the differences in interpretation among the neurosciences and mystical experience. They should look to the brain/mind as a way to mediate and make sense of these differences. Neurologists may not have the whole picture of religious experience, but neither do theologians. It is necessary to understand the bridge between these fields, for a more complete understanding of both of them.

So why does this all matter? As discussed above, the scientific academy – at least, a significant portion of it – has long claimed that mystical and religious experiences only find their basis in mental illness and disorderly mind function. It is clear, based on numerous studies resisting the idea of the reality of mysticism and religion, that academia is generally dismissive of the idea of genuine mystical experience engendered by the beauty and splendor of the divine. Moving forward, those in these fields must seek to work together and understand each other and each other’s fields of study, to promote a complete picture, beyond the beliefs and convictions of just one side or the other.

Neurotheology has a number of important contributions to make in both neurology and theology. Neurotheology is the bridge that connects the biology of the brain with religious belief. Without one or the other, there is a lack of understanding of the whole picture. Neurology cannot fully understand the incredible capacity of the brain without examining something as complex as religious experience, and theology cannot fully appreciate the reality of religious experience, especially its universality, without also tending to the biology of the brain. The widespread experiences of the world’s religions can work to form a universal picture of what the brain can do in regards to its encounters with mysticism and beauty.

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¹⁰ Newberg, *Principles of Neurotheology*, 52.

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