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Laughlin, and others attempted to relate neuropsychology to religious phenomena, for example, by looking for the neuropsychological determinants of ritual behavior. Researchers also studied the psychological characteristics linked to dominance of the left or right hemisphere of the brain in relation to various patterns of belief and images of the divine. John Ashbrook suggested the term *neurotheology* for this type of inquiry.

Since the 1980s, the search for specifiable brain structures and brain functioning in correlation to religious or mystical experiences has come to the foreground. Along this line, Michael Persinger as well as Vilayanur Ramachandran have claimed a direct relation between religious experience and temporal lobe activity. Persinger interprets this relationship atheistically, but others point out that it validates neither an atheistic nor a theistic conclusion.

D'Aquili and Andrew Newberg have gone considerably beyond the temporal lobe hypothesis by developing a model for religious experiences that involves the entire brain. This model is based in part on non-invasive neuroimaging of the working brain during ritual behavior and meditation. It is especially this kind of work that is commonly labelled *neurotheology*. Its aim is to explore the question of how religion and God are perceived and experienced by the human brain and mind. This research has revealed that during meditation and worship, the level of activity in those parts of the brain that distinguish between the self and the outside world is diminished. D'Aquili and Newberg regard their research not only as neuroscience but also as a contribution to theology because they feel that it will bring all the elements of religion under one rational explanatory scheme, namely that of neuroscience.

The second line of research concerns a portrayal of human personhood, which is both neuroscientifically and theologically accurate. The neuroscientific discourse on the human person, increasingly vocal since "the decade of the brain" (1990–2000), seems to be at variance with theological discourse on that subject. In the latter, mind and soul, free will, consciousness, responsibility, and the human being's contact with God are thought to be fundamental characteristics of the human person. In neuroscience, all of these are either seriously doubted or reduced to their underlying material relationships.

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## NEUROTHEOLOGY

The term *neurotheology* refers to the attempt to integrate neuroscience and theology. Depending on whether its subject matter is defined in terms of religiosity or human personhood, neurotheology may be divided in two main lines of research.

The first line of research was dominant during the 1970s and 1980s when Eugene d'Aquili, Charles

This second type of neurotheology aims at improving the compatibility of theology and neuroscience with regard to the concepts of human personhood. Here, conceptual analyses, such as the analysis of free will, and concepts from the philosophy of mind, such as supervenience, play an important role. The work of the international research group co-sponsored by the Vatican Observatory and the Center for Theology and the Natural Sciences in Berkeley, California, represents this type of inquiry. Beyond compatibility, this “neurotheology of the person” also aims at the mutual enrichment of theology and neuroscience. Whereas the latter may help theology incorporate materiality in its conceptions of human personhood, theology may stimulate neuroscience to be mindful of the more holistic or synthetic characteristics of being human.

*See also* COGNITIVE SCIENCE; CONSCIOUSNESS STUDIES; EXPERIENCE, RELIGIOUS: COGNITIVE AND NEUROPHYSIOLOGICAL ASPECTS; EXPERIENCE, RELIGIOUS: PHILOSOPHICAL ASPECTS; FREEDOM; NEUROSCIENCES; PRAYER AND MEDITATION; SOUL

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PALMYRE OOMEN