# *The Potential Religious Relevance of Entheogens*

*with Ron Cole-Turner, "Entheogens, Mysticism, and Neuroscience"; William A. Richards, "Here and Now: Discovering the Sacred with Entheogens"; G. William Barnard, "Entheogens in a Religious Context: The Case of the Santo Daime Religious Tradition"; and Leonard Hummel, "By Its Fruits? Mystical and Visionary States of Consciousness Occasioned by Entheogens."*

## ENTHEOGENS, MYSTICISM, AND NEUROSCIENCE

*by Ron Cole-Turner*

*Abstract.* Entheogens or psychedelic drugs such as lysergic acid diethylamide (LSD) and psilocybin are associated with mystical states of experience. Drug laws currently limit research, but important new work is under way at major biomedical research facilities showing that entheogens reliably occasion mystical experiences and thereby allow research into brain states during these experiences. Are drug-occasioned mystical experiences neurologically the same as more traditional mystical states? Are there phenomenological and theological differences? As this research goes forward and the public becomes more widely aware of its achievements, religious scholars and experts in science and religion will be called upon to interpret the philosophical and theological presuppositions that underpin this research and the significance of the findings that flow from it.

*Keywords:* cognitive science; entheogen; mystical experience; mysticism; neuroscience; psilocybin; psychedelic

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Entheogens or psychedelic drugs are known to facilitate the occurrence of mystical states. As part of the American-led "war on drugs," however, these substances have been tightly regulated for decades under the terms of global treaties. Lysergic acid diethylamide (LSD) and psilocybin are classified as Schedule I drugs, which means that they are thought to have a high potential for abuse and to have no currently accepted medical use. The main purpose of classification is to prevent "recreational use."

That prohibition is not working very well, at least not in the United States. Statistics compiled by the 2010 National Survey on Drug Use and

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Health (NSDUH) reveal that an estimated 32 million U.S. residents report using LSD, psilocybin, or peyote or its derivative, mescaline. While the reported use is low among adults over age 65, the numbers for "baby boomers" and younger adults are roughly even, with about 22 percent of males between 18 and 65 and 12 percent of females reporting at least one-time use. Perhaps unexpectedly, when rates of use are broken out by age, the highest rate is among young adults 30–34, with 26 percent of males and 15 percent of females reporting use. Adults under 30 are close behind in their rate of use.

The numbers also reveal an interesting trend away from LSD use and toward psilocybin, which may be ingested from "sacred mushrooms" or taken orally in tablet form. "Use of psilocybin mushrooms has increased since the 1970s in the United States and worldwide, likely due to dissemination of simple home cultivation techniques, instructions on finding wild mushrooms, and information about effects and methods of psilocybin mushroom use" (Krebs and Johansen 2014, 2).

What exactly are the effects of psilocybin? Schedule I classification stands in the way of getting good answers. It may not prevent recreational use, but current drug policy prevents or at least sharply curtails legitimate scientific research. The obvious irony is that the classification is based on the view that these drugs have no known medical use, something that is hard to dispute if research cannot be done.

This may be about to change. Among those protesting current drug policy is the British Neuroscience Association. According to its June 2013 statement, "The BNA believes that current legislation regarding the use of psychoactive drugs in biomedical research is unnecessarily restrictive and should be revised to take into account available scientific evidence on the potential benefits and risks of such drugs" (BNA 2013). This policy statement was accompanied by an article published in the highly respected journal, *Nature Reviews Neuroscience*. Arguing on the grounds of scientific freedom, the authors urged government regulators to loosen restrictions on research (Nutt, King, and Nichols 2013).

Similar steps are being taken by popular publications like *Scientific American*. In the February 2014 issue the magazine's editors claim that a Schedule I classification creates a "*de facto* ban." According to the editorial, "The endless obstructions have resulted in an almost complete halt in research on Schedule I drugs. This is a shame. The U.S. government should move these drugs to the less strict Schedule II classification. Such a move would not lead to decriminalization of these potentially dangerous drugs—Schedule II also includes cocaine, opium and methamphetamine, after all—but it would make it much easier for clinical researchers to study their effects" (*Scientific American* 2014).

To be clear, research involving entheogens is not impossible, merely difficult and time-consuming in terms of securing permission. With

impeccable credentials and enormous patience, investigators can receive a research exemption that allows them to undertake limited pilot studies and even double-blind trials, often using private funding. As this research goes forward, results are widely reported in mainstream media. This raises the possibility that public support for research will become more widespread.

In the 1960s, prominent scholars like Huston Smith and Walter T. Stace were involved in reflecting critically on research on entheogens and mystical experience. Today, we are witnessing a rebirth of research that is more scientifically rigorous than what occurred before. At universities in Europe and the United States, biomedical research teams are using new methods to explore the relationship between entheogens, brain states, and mystical experience. Today's scholars in science and religion and journals like *Zygon* have a role to play in interpreting these developments for the wider public. With that objective in mind, this issue of *Zygon* features articles by William Richards, G. William Barnard, and Leonard Hummel, who summarize key aspects of this renaissance in research and comment critically from their perspectives as scholars of religion.

The new research, which has already made important advances, is working with a number of substances that include LSD and psilocybin but also MDMA (known more widely as "ecstasy") and ayahuasca, a psychoactive brew or tea derived from a vine. Ayahuasca is particularly interesting because it is actively used in religious worship, which makes it possible for scholars to explore a wide range of social and cultural factors related to its use. Among the religious groups that use ayahuasca is the Santo Daime, described in this issue of *Zygon* in detail by G. William Barnard and also in a recent article by Marc Blainey (2014). Whether psilocybin or any other substance ever becomes a part of any traditional or established Christian worshipping community is a question explored in this issue of *Zygon* by Leonard Hummel.

A particular focus in the new research has involved psilocybin, and new studies have explored a range of questions about the possible value of this substance. Does psilocybin play a helpful role in psychotherapy, addiction recovery, or theoretical neuroscience? The answer seems to be yes to all of these, but more research is needed. What makes psilocybin most interesting and significant for scholars of religion, however, is the way it occasions spiritual or mystical experiences. William Richards, a psychologist and scholar of religion who has been involved in studies of LSD and psilocybin since the 1960s, provides an inside view of research into the relationship between these drugs and mystical experience (Richards 2014 [this issue]; cf. Richards 2005, 2009). The most important recent work on the relationship between psilocybin and mysticism is currently under way at Johns Hopkins. A team of researchers led by Roland Griffiths has now published a series of articles detailing their work (see Griffiths et al. 2006, 2008, 2011).

## Mystical Brains

In the space remaining in this introductory essay, however, I want to turn our attention to research being conducted at the Imperial College in London. While Richards and Griffiths and their collaborators at Johns Hopkins explore the relationship between psilocybin and mystical experience, the London team led by Robin Carhart-Harris and David Nutt use brain imaging technology to investigate the relationship between psilocybin and the brain. It has been known for years that LSD, psilocybin, and mescaline act upon serotonin receptor sites in the brain. They specifically seek out the serotonin 2A receptor (5-$HT_{2A}$R). It seems reasonable to think that LSD or psilocybin *excites* these receptor sites, somehow triggering activity that might be seen as the neurological correlates of subjective mystical experience.

This view was widely held until very recently. For example, in a chapter in *Where God and Science Meet: The Psychology of Religion Experience*, published only in 2006, we read the following explanation of the action of entheogens on the brain: "One could envision, therefore, that hallucinogens greatly enhance the sensitively and excitability of cortical processing . . . " (Nichols and Chemel 2006, 25). The authors continue:

> In the context of a religious or transcendent experience, the most important idea to keep in mind is that the cortex is hyperexcitable, attempting to process and integrate information, while at the same time the normal sensory information that it should be processing has been reduced or, at high doses, possibly eliminated by changes in thalamic gating functions. We posit that the cortex will fill in or extrapolate missing information, creating sensory constructs were none exist . . . .What quality of consciousness will be generated under these conditions? (Nichols and Chemel 2006, 25)

The key idea is that the drugs stimulate the brain to create visionary or mystical experiences. As the authors put it, "the neurochemical brain changes induced by psychedelics produce a visionary experience" (Nichols and Chemel 2006, 26). Entheogens enhance excitability, thereby "creating sensory constructs" to "produce a visionary experience."

We now know that this is almost completely wrong, first of all because mysticism is not defined as "visionary experience." It is true that sometimes visionary experience accompanies mystical experience, sometimes as its precursor. But mysticism is not the same as visions. Ever since the work of William James (1902) and Walter T. Stace and Huston Smith (1987 [1960]), mysticism is understood as a state of consciousness that transcends awareness of specific objects, ordinary or visionary. For the Johns Hopkins team, reports of visions are common but not taken as evidence of mystical states (Richards 2014 [this issue]).

It is also wrong because of the unexpected finding reported by Carhart-Harris and Nutt in 2012. In their report, they write: "It has been commonly

assumed that psychedelics work by increasing neural activity; however, our results put this into question" (Carhart-Harris et al. 2012, 2014). Psilocybin does not excite the brain (least of all to "create" visions) so much as it decreases its activity. Furthermore, these decreases in brain activity are not evenly distributed but are concentrated in key regions of the default mode network (DMN), a network that ordinarily receives much more blood flow and uses more energy than most areas of the brain. The most recent scans reveal that when psilocybin enters the brain, brain flow decreases specifically in the key regions that make up the DMN, such as the posterior cingulate cortex (PCC). "The decreases were localized to high-level associational cortices, including key regions of the DMN" (Carhart-Harris et al. 2014, 5).

Why is it important to note that the DMN is most directly affected by psilocybin? The DMN is described "as the highest level of functional hierarchy . . . [and] as a central *orchestrator* or *conductor* of global brain activity" (Carhart-Harris et al. 2014, 6). It has less to do with sensory processing and more to do with "higher-level, metacognitive operations such as self-reflection" (Carhart-Harris et al. 2014, 6). The researchers suggest that the DMN consumes so much of the brain's energy because it is "the physical counterpart of the narrative-self or ego" (Carhart-Harris et al. 2014, 6). It is "the seat of the ego" (Carhart-Harris et al. 2014, 12). Psilocybin selectively decreases the activity and the connectivity of the DMN, which seem to diminish its role in coordinating or orchestrating other brain activities.

Perhaps most interesting is the correlation between decreases in brain activity and the subjective experience reported by the volunteer subjects. According to the 2012 research data, "Psilocybin significantly decreased brain blood flow and venous oxygenation in a manner that correlated with its subjective effects" (Carhart-Harris et al. 2012, 2141). In their 2014 paper, the research team highlights this correlation even further, saying that "it was remarkable that we recently found a highly significant positive correlation between the magnitude of alpha power *decreases* in the PCC [a region of the DMN] after psilocybin and ratings of the item 'I experienced a disintegration of my "self" or "ego".' . . . It is a central hypothesis of this article that psychedelics induce a primitive state of consciousness . . . by relinquishing the ego's usual hold on reality" (Carhart-Harris et al. 2014, 8).

At just this point, it becomes clear that the work of the Imperial College team is highly suggestive in terms of how psilocybin might function in the brain to "occasion" mystical experience. Psilocybin acts not by increasing but by decreasing brain activity and connectivity, not by creating or generating visions but by opening the brain to a more basic or primary level of consciousness. The report calls attention to this by quoting Stace's classic book on *Mysticism and Philosophy*: "If we consider contemporary accounts

of the mystical consciousness, we can see that the individuality, the 'I,' disappears and is in a sense 'annihilated'" (Stace quoted in Carhart-Harris et al. 2014, 14). Then the biomedical researchers make this claim: "Stace's work is particularly useful because his ideas resonate with the findings of recent neuroimaging studies relevant to the neurobiology of spiritual experience" (Carhart-Harris et al. 2014, 15). The claim that subjective reports of mystical experience "resonate" with the latest brain imaging is based in large part on the finding that psilocybin decreases the activity and the connectivity of the DMN.

Whatever exactly may be meant by the claim that subjective reports "resonate" with brain imaging, it is worth noting that the resonating pathways seem to flow in two directions. Brain images showing a decrease in DMN activity and connectivity resonate with or provide some confirming evidence for the accuracy of the subjective report of "loss of self." But at the same time, subjective reports provide some "resonating" evidence in support of the general theory of mind that Carhart-Harris and others are developing in this particular essay. That theory, which they call the "entropic mind" and other researchers call the "metastable brain," raises questions for scholars interested in neuroscience and religion that lie far beyond the scope of this article (Carhart-Harris et al. 2014; Muthukumaraswamy et al. 2013; Tognoli and Kelso 2014).

What are we to make, however, of the subjective experience of loss of self that seems to resonate with the decrease in DMN activity? Many scholars of religion are familiar with Stace or perhaps more likely with the pioneering work of William James (1902). Among the many sources of evidence James cites is a letter by the English poet, Alfred Lord Tennyson. Stace repeats the quote, in which Tennyson describes what he claims is a frequent experience: "All at once, as it were out of the intensity of the consciousness of individuality, individuality itself seemed to dissolve and fade away into boundless being, and this was not a confused state but the clearest, the surest of the sure, utterly beyond words—where death was an almost laughable impossibility—the loss of personality (if so it were) seeming no extinction but the only true life" (Stace and Smith 1987 [1960], 119, quoting from James 1902, 374).

The great poet, to be sure, is not using psilocybin. But the mystical experience Tennyson reports is more than eerily similar to the subjective experiences reported by the London group. Stace, at least, thought that there is no philosophical distinction to be made between entheogen-related mystical states and those that came from mediation or prayer. He objects, for example, to those who think that "a mescalin [sic] experience cannot possibly be a genuine mystical experience, however indistinguishable therefrom it may be in its phenomenology" (Stace and Smith 1987 [1960], 70). Huston Smith, of course, agreed with this view and quotes an

informal comment by Stace in support: "When the current philosophical authority on mysticism, W. T. Stace, was asked whether the drug experience is similar to the mystical experience, he answered, 'It's not a matter of its being *similar* to mystical experience; it *is* mystical experience'" (Smith 1964, 523–524).

## The Varieties of Religious Experiments

Whether or not Stace and Smith are right about this is a matter of ongoing religious and philosophical debate, one on which today's empirical research seems to be tipping the balance of evidence in favor of Stace and Smith. A related question is whether the events in Tennyson's brain, or the brain of anyone undergoing a similar spiritual or mystical experience, correspond in even a rough way to what happens in a research volunteer's brain when psilocybin is present. On its face, that is an entirely empirical question, but we may never have the technology or research methods to answer it because of the inherent unpredictability of traditional mystical experience. For that reason, it is worth nothing that one of the most significant features about the way entheogens occasion mystical experience is the reliability of the experience. In the 2006 report of the first recent psilocybin/mysticism studies, the Johns Hopkins researchers call attention to the fact of reliability and note its significance for future research. "The ability to occasion such experiences prospectively will allow rigorous scientific investigations of their causes and consequences" (Griffiths et al. 2006, 268). If traditional and entheogen-induced mystical experience is essentially the same in terms of its basic neurology, then the significance of psilocybin as a tool of research into spiritual experience is great indeed.

Not everyone will agree, of course. But for the sake of argument let us suppose that Smith and Stace are right: entheogen-occasioned mystical experience *is* mystical experience. And, let us suppose that there is some broad similarity between the brain states imaged by the London research team and the brain states of other mystics. If so, then what the London team "captures" in its imaging devices is the neurological correlate of the moment of the loss of the sense of self, that loss of personality described by poets and mystics alike when a sense of utter unity replaces ordinary awareness of distinction and separation.

But unfortunately, there is more. The "loss of self" is accompanied by "magical thinking," at least in London. Perhaps it is the way in which categories are defined, questions phrased, and data collected, but the Imperial College team found that research volunteers report that when psilocybin is present and when DMN activity decreases, the tendency to believe things without evidence also increases. The more psilocybin diminishes DMN activity and connectivity, the more research volunteers tend to agree with

statements like "the experience had a supernatural quality" (Carhart-Harris et al. 2014, 9). If a sense of unity is a good thing (at least from the viewpoint of traditional mystics), magical thinking is clearly not.

"Magical thinking" is defined by the London team as "a style of cognition in which supernatural interpretations of phenomena are made" (Carhart-Harris et al. 2014, 7). It is characterized by wishful thinking and may be associated with a happy mood and with creativity. But it is not based in realism about the environment. "Magical thinking" also is present in the unfounded negative conclusions that are part of paranoia. One of the reasons why the DMN plays such as important role in the adult brain is that it keeps magical thinking in check. Because of the way they define magical thinking and their concern about it, the London team seems eager to use psilocybin for neuroscience and even for some forms of psychotherapy but not so much as a pathway to mystical experience. One more quotation from the 2014 research report shows this clearly. If it is true that psilocybin brings the brain to a state of greater flexibility or "criticality," and if such as brain "is a happy brain, then it would follow that psychedelics could be used to enhance well-being and divergent thinking, even in already healthy individuals. One negative consequence of this however could be the neglect of accurate reality-testing" (Carhart-Harris et al. 2014, 12). In other words, divergent thinking might come at the cost of "magical thinking."

The Imperial College team grants that "some people report being so profoundly affected by such experiences (and often seemingly for the better)" (Carhart-Harris et al. 2014, 12). They cite the research of the Johns Hopkins team in providing evidence to support this claim. But then they complain that "some people celebrate and romanticize the psychedelic experience and even consider it 'sacred'" (Carhart-Harris et al. 2014, 13).

At precisely this point, the research method of the London group differs most sharply from the research being conducted at Johns Hopkins. The Hopkins team is looking specifically for subjective reports of mystical experience. They design their research methods and questionnaires to gather such data. The London team, on the other hand, is looking primarily for the neural effects of psilocybin. Then they correlate these effects with subjective experience, which they categorize in 23 different subjective items. One of these items—"the experience had a supernatural quality"—is then interpreted using a pejorative term, "magical thinking." Not unexpectedly, "magical thinking" is seen as a problem, a risk factor, an unintended and unwanted side effect. But we might wonder why an experience with a supernatural quality is something to be avoided.

By contrast with their colleagues in London, the Johns Hopkins team asks questions that provide evidence for what they label as a "sense of sacredness" and a "noetic quality (claim of intuitive knowledge of ultimate reality)" (Griffiths et al. 2006, 272). They do not label this "magical thinking" or a risk to be avoided but see it instead as evidence of mystical

experience, quite possibly as something to be desired. What one team describes as a negative and a risk factor, the other group sees as a positive outcome, something that many people value, a necessary component of a "complete" mystical experience, and a key reason to continue with research involving psilocybin. For one team a "supernatural quality" is "magical thinking." For the other, a "sense of sacredness" and a "noetic quality" is "mystical."

More than science is at play here, and more than religion is at stake. This research, defined as it is by various presuppositions and competing purposes, will continue and expand in the years ahead. As it does, we will learn more about how these substances affect the brain. We will gain new insight into the phenomenology of mystical experience and how intense personal meaning is attached to it. We will discover new ways to think about what happens in the brain when human consciousness is open to richer levels of awareness. What will we make of what we are about to discover?

## Note

This article is based on a presentation entitled "The Rebirth of Entheogens: New Medical Research on Drug-Related Mystical Experience and Its Implications for Religious Studies," offered at the annual meeting of the American Academy of Religion, Baltimore MD, November 24, 2013.

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