Fingerprints of god
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Riverhead books 2009

Notes to text

Franz Vollenweider's research has identified serotonin, and a particular serotonin receptor, as keys to mystical experience. Dopamine and glutamate interact with serotonin and other chemicals.
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Is a chemically induced experience a *real* spiritual experience? Do drugs trigger a genuine encounter with "god"?

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Aldous Huxley, in his book *The Doors of Perception*, proposed that the brain is a 'reducing valve'. He suggested that all around us is the Mind at Large, (an information field) which comprises everything; all reality, all ideas, all images. The brain narrows that information to a small trickle.

Huxley suggested that drugs temporarily open the valve. This view is shared by some current resesrchers.

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Johns Hopkins study: terminally ill cancer patients divided into two groups: those who had mystical experience and those who had not. Those who had manifested more capacity for intimate contact, as well as decrease in anxiety and depression.

The meaning of pain changed. Before a mystical experience, terminally ill patients would say "I'm suffering, I'm scared; I'm in pain." After a mystical experience, people would say the pain is still there, but it's on the periphery of consciousness; at the center of consciousness would be relationships with people important to them.

Stanislav Groff noted that after mystical experience, people loose fear of death, as have people who have had NDEs. He found out that lack of fear had a tremendous impact on pain. In his book The Ultimate Journey, Groff recounts the experiences of those taking psychedelic drugs at the Maryland Psychiatric Center. Patients emerged from the trips convinced that life and love extend beyond the grave. Often pain levels would drop so dramatically that bedridden patients were able to return to work for weeks or months.

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Thanks to technology, neurologists can now watch the mechanics of mystical experience. science has confirmed that brain activity correlates to spiritual experience. In all likelihood, during spontaneous mystical experience, certain neurotransmitters are coursing through the brain.

This does not establish, in my opinion, that mystical experience is nothing but brain chemistry.

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The vast majority of scientists now understand epilepsy to be a neurological disorder, a firestorm in the brain. Armed with evidence from brain scans, some modern neurologists are, like Michael Persinger, reframing religious history. The effect has been not to present the disease as sacred, but to present the sacred as a disease.

The list of religious leaders who, neurologists say, might have suffered from temporal lobe epilepsy is as long as it is impressive.

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The search for the spiritual brain center began almost by accident, with the work of Wilder Penfield.
While exploring the temporal lobes, a very few of his patients reported out of body experiences, hearing voices, and seeing apparitions. This led to the suggestion that there may be something special about the temporal lobes. Soon after, the connection between mystical experience and temporal lobe epilepsy was made. Although the spirituality as epilepsy theory remains controversial, many neurologists accepted the idea that increased temporal lobe activity is central to spiritual experience.

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Some neurologists are exploring the epilepsy question, not to dismiss spiritual experience as a brain dysfunction, but to understand it.

As Jeffery Saver, a neurologist at UCLA says, “patients give us clues as to what parts of the human brain are involved when *all of us* have a numinous experience.

There is no evidence of a special sense organ that is in contact with the divine. On the other hand, the divine may come thru our usual sensory faculties, ordinary sensory stimuli stamped with special meaning. The part of the brain that stamps events as having divine qualities is the temporal limbic system. The hippocampus is essential for storage of long term memories; the amygdala is the fight or flight messenger. Together, the hippocampus and amygdale stamp people, places, and things with meaning.

A seizure begins by the cells of a particular area in the brain moving in synchrony with one another;
[that is, in resonance] If the seizure occurs in the temporal lobe- which is likely, since the temporal lobes are the most electrically excitable- normal emotions have an exclamation point after them.

if the electrical resonance ("electrical storm") rolls through often enough, it can physically rewire the brain.

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But suppose the proper analog is not an electrical storm, but a radio transmission, in which the brain is a radio receiver. Several scientists have proposed this. if this analogy is carried further, as it is by an increasing number of scientists, then the 'sender' is separate from the 'receiver'. Maybe people with an overactive temporal lobe are able to tune into another dimension of reality.

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[note: it looks like several things are going on here, which the author has conflated:
1) seizure as the brain cells in coherence and 2) seizure as a special signal from outside the brain]

Are we medicating away realities or delusions?

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Scott McDermott is an accomplished virtuoso in communicating with the Christian God.
Hagerty meets Scott McDermott in the radiology department at the Hospital of the U of Pennsylvania, where Andy Newberg worked. Newberg coauthored the book *Why God Won't Go Away*, which explores the events in people's brains while they are having mystical experiences. Newberg has studied the brain patterns of Tibetan monks, Franciscan Nuns, Sikhs, Pentcostals. Newberg runs a brain scan on McDermott; two cases: 1) think about anything but prayer and god; 2) pray intently. Scott had visual and auditory sensations during the pray portion of the test. Scott's scan straddled two types of states Newberg had discovered; one was a meditative state of mind, the other, an ecstatic Pentecostal prayer state of mind.

Newberg has found that those in meditative states, whether Christian nuns or Buddhist monks, showed the frontal lobes glowed red with activity, while the parietal lobes (the orientation area) remains dark.
The frontal lobes handle the details, helps plan and execute tasks, keeps you alert and focused.

Those in Pentcostal/charismatic states showed the reverse pattern: parietal glows red and frontal dark.

For all these, during the resting times, the two thalami show asymmetry; one is more active than the other.

Because brains are plastic, those not graced with natural mysticism may learn how to enter mystic states.

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Richard Davidson, of U of Wisconsin, has studied the neural correlates of emotion. He demonstrated that mental exercise can sculpt a person's mental circuitry, just as weight lifting can sculpt bicepts.

Earlier studies showed that people with higher brain wave activity in the left prefrontal cortex reported feeling more alert, energized, enthusiastic, and joyous. People with higher brain wave activity in the right prefrontal cortex reported more worry, anxiety, and sadness. Davidson found that Buddhist meditators could, with a little focus, shift their brain wave activity to the left side of the brain.

The Dalai Lama sent eight of his monks to Davidson's lab in Madison WI for testing. The left prefrontal lobes of these monks was a cauldron of synchronized high frequency gamma wave activity, to a degree never before seen from pure mental activity. The synchronization produced an "ah-ha" moment, when your brain brings together info from diverse sources, Normal "ah-ha" states last only a few milliseconds. Davidson reported that the monks were able to sustain the "ah-Ha" state for over five minutes at a time.

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Davidson's research suggests that with enough "practice", a normal brain could scale spiritual and neurological heights. Testing showed that with practice at meditation, regular people could shift their brain states from right to left prefrontal cortex.

Michael Sabom, a cardiologist, was given a copy of Raymond Moody's book *Life After Life*, in 1976.
At first skeptical, he eventually spent a lot of time studying the issue. Between 1976 and 1981 Sabom conducted meticulous research on nd and oob experiences. He found that some experiencing nd were able to give vividly detailed narrations of the events transpiring while they were clinically "dead". He also did a mini-study; he compared interviews with 32 patients claiming to have 'watched' attempts at their resuscitation, with reports of 25 'control' patients, who did not claim such watching, but who were asked to describe what they would have seen. 23 of the 25 patients in the control group made major errors in their description of what happened.

Another strategy was to place targets, like symbols or images, out of range of a would be out of body experiencer. No confirmation of this strategy

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The 2006 conference of the International Association for Near Death Studies was hosted by the M.D. Anderson Cancer Center in Houston Texas, one of the premier cancer hospitals in the world. This was a water shed moment for the NDE community. NDEs had arrived.

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Pam Kircher, physician at M. D. Anderson, trained to help patients at the end of their lives. She noticed that routinely dying patients talked with deceased relatives. At first the thought they were hallucinating, so she devised a test. She would interrupt the conversation with deceased aunt Sally, asking a question. They would stop their conversation with aunt Sally and politely respond, and then continue their conversation with aunt Sally. Kircher says that a hallucinating person cannot be pulled back to reality, but her patients could be pulled back.

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University of Montreal; Mario Beauregard found that brain imaging studies of nuns showed that areas associated with positive emotion became very active; areas of unconditional love became active, and parietal lobes, which determine the subject's physical boundaries, showed unusual changes in blood flow. The part of the brain usually associated with "the subjective experience of contacting a spiritual reality" spikes. Their brains seemed to be saying that the nuns felt themselves absorbed in something greater then themselves. Beauregard amassed sufficient brain images to make the case that a mystical state was physiologically distinct from either an intensely emotional or resting state. He also discovered that near death experience unfolds in the brain in much the same way as a meditative union with God.
He also found that both groups could re-enact their spiritual experience, and manipulate their brainwave activity to open a spiritual realm.

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Larry Dossey: God may be non-local mind
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Thomas Kuhn, in his book *The Structure of Scientific Revolutions*, presented a new model for scientific progress. He argued that science proceeds not by steady accumulation of knowledge, but by "a series of peaceful interludes punctuated by intellectually violent revolutions" He argued that scientists are not the freethinking and objective investigators they fancy themselves. Rather, they tend to assimilate what they have been taught and work on solving problems within an accepted paradigm. Normal science, Kuhn observed, "often suppresses fundamental novelties because they are necessarily subversive of its basic commitments". Data that is produced by scientists that challenge the prevailing consensus is often dismissed as simply wrong. Eventually, the dissonance between prevailing and new may become so great that a paradigm shift occurs.

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