

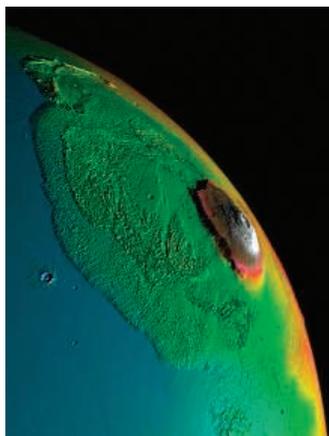
GOD ON THE BRAIN

Nuns replaying past mystical experiences have made the latest contribution to the burgeoning field of "spiritual neuroscience."

Psychologist Mario Beauregard of the University of Montreal in Canada and his student Vincent Paquette recruited 15 Carmelite nuns, all of whom had had at least one intense mystical experience. The two researchers looked at the nuns' brains using functional magnetic resonance imaging while the sisters tried to re-evolve such experiences. As a control, the nuns' brains were also imaged while they tried to relive "the most intense state of union with another human" they had ever felt.

Beauregard says that some researchers have theorized that religious experiences involve epilepsy-like seizures in temporal lobes. But the mystical condition activated dozens of brain areas involved in perception, emotion, and cognition, he and Paquette reported last week in *Neuroscience Letters*. The pair also conclude that although there is much overlap with the feelings of peace and love from the control condition, the mystical condition has its own signature, with "relatively different regional patterns of brain activation."

Physician Andrew Newberg, head of the newly established Center for Spirituality and the Mind at the University of Pennsylvania, says the study indicates that a mystical state activates a larger brain area than would ordinarily be involved in focusing on a specific problem or memory, so such states are "extremely complex."



Polar wander on Mars was caused by large volcanoes.

<< WANDERING POLES

New findings support an old but controversial theory that Earth's poles have on occasion made gigantic shifts in their placement. Such major relocations, known as "true polar wander," are believed to result from changes in weight distribution on a planet's surface, such as those caused by a huge volcanic eruption. This would cause the planet to realign itself in relation to its spin axis, moving the poles.

Evidence that Earth's poles shifted dramatically about 800 million years ago has been found in magnetic rocks in Australia and China. Now, a team led by geologists Adam Maloof of Princeton University and Galen Halverson of Paul Sabatier University in Toulouse, France, have added data from Norwegian rocks. As magnetic mineral grains were deposited or excreted by microbes in the rocks, they aligned themselves with Earth's magnetic field, becoming frozen compasses pointing to an ancient north pole. Maloof and Halverson estimated from a stack of deposits laid down over the course of 20 million years that during that time, the north pole shifted more than 50 degrees—about the distance between Alaska and the equator.

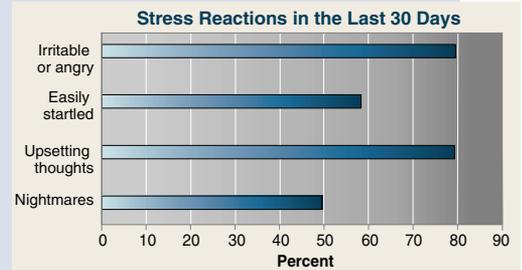
The paper, published in the September-October issue of the *Geological Society of America Bulletin*, is an "important one," says geologist Rob Van der Voo of the University of Michigan, Ann Arbor, and it will help scientists determine how the continents fit together in the ancient supercontinent Rodinia.

Katrina's Mental Fallout

The incidence of serious mental illnesses among Hurricane Katrina survivors doubled within 5 to 8 months after the storm, according to a telephone survey by epidemiologists at Harvard Medical School in Boston. But the study found a surprising absence of suicidal tendencies among the survivors.

The researchers interviewed 1043 survivors between 19 January and 31 March about their post-Katrina experiences and documented that 30% had mental-health problems, half of them serious—a doubling of the rate seen in a face-to-face survey conducted between 2001 and 2003.

Problems such as anxiety and nightmares among New Orleans residents (see chart) were more frequent than among hurricane survivors elsewhere.



Project director Ronald

Kessler said the findings show that many "have a level of [mental] disorder that is going to interfere with the rebuilding of their lives." Most (84.6%) had lost their housing and income, and 36.3% had experienced severe physical hardship, including hunger. Of the 40.6% who experienced five or more stressors, such as property loss, physical hardship, or losing a loved one, close to half were in the bottom 25% of income level.

But despite the problems, suicidal tendencies had decreased since the storm: Only 0.4% reported such thoughts compared to 3.6% in the earlier survey. The researchers attribute this to a sense of personal growth following the disaster. For example, 88.5% reported developing a deeper sense of meaning or purpose in life, and 83.4% were confident in their ability to rebuild their lives.

Scientists will continue to track the group over the next few years.

CREDITS (TOP TO BOTTOM): ARCHIVO ICONOGRAFICO, S.A./CORBIS; SOURCE: KESSLER ET AL., MENTAL ILLNESS AND SUICIDALITY AFTER HURRICANE KATRINA; NASA