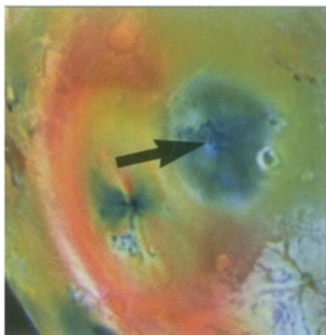


New fire on Io

Jupiter's moon Io has a new black eye. The huge dark spot, 400 kilometers in diameter, surrounds the volcano Pillan Patera and probably represents debris that rained down on the surface from an active plume. The darkest, sinewy features at the center of the deposit may be fresh lava flows.

The Galileo spacecraft first imaged the spot in September. The feature, which was not present when the craft viewed the same region in April, represents the largest change that Galileo has ever recorded on this volcanically active moon.

In June, both the craft and the Hubble Space Telescope recorded what now appears to be the source of the debris: a 120-km-high plume emanating from Pillan Patera.



Io's new dark spot (arrow) surrounds the volcano Pillan Patera. The red ring is material spewed from the volcano Pele.

Most plume deposits on Io show up as white, yellow, or red—colors typical of sulfur. The new deposit is gray, indicating that it is probably richer in silicates than the other volcanic debris, says Galileo scientist Alfred S. McEwen of the University of Arizona in Tucson.

Although the high temperatures on Io suggest that silicate, a kind of volcanic rock found on Earth, should be common on this Jovian moon, the fresh plume debris offers the first visual evidence of such material, says McEwen. Infrared spectra of the debris, taken by another Galileo instrument, indicate that the material is either silicate or iron pyrite, commonly known as fool's gold, says Robert W. Carlson of NASA's Jet Propulsion Laboratory in Pasadena, Calif.

The Io image, which NASA released in early November, also reveals changes in the color and distribution of material surrounding the well-known volcano Pele, which lies about 400 km southwest of Pillan. Both volcanoes may have erupted at the same time, and their plumes could have interacted. —R.C.

Farewell to Pathfinder

Built on a shoestring, the Pathfinder lander and its little rover Sojourner have captivated millions of people since the two landed on Mars on July 4. Alas, the arrival of autumn appears to have permanently chilled Earth's love affair with the probes.

Pathfinder has failed to transmit data from the rover or from its own cameras and detectors since Sept. 27. Ground stations have not heard even routine signals from it since Oct. 6. After a month of daily efforts to make contact, NASA decided to call it quits on Nov. 4.

"We concede that the likelihood of hearing from the spacecraft again diminishes with each day," says Pathfinder project manager Brian Muirhead of NASA's Jet Propulsion Laboratory in Pasadena, Calif. Both the rover and the lander far exceeded their design lifetimes, but researchers had hoped the mission would last for many more months.

Flight operators believe that Pathfinder's batteries died after the Sept. 27 transmission. Without power to keep it warm, the lander was exposed to the frigid temperatures of early autumn on Mars and stopped functioning, researchers surmise.

Still, scientists will continue trying to contact the lander a few times each month. The best chances of getting a return signal may not come for another year, the next time that the warmer temperatures of summer will prevail at the landing site. For now, Sojourner, programmed to return to the lander if it stops receiving commands from Pathfinder, may be heading home toward its mother ship. —R.C.

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Why are individuals from the same family often no more similar in personality than those from different families? Why, within the same family, do some children conform to authority while others rebel? The family, it turns out, is not a "shared environment" but rather a set of niches that provide siblings with different outlooks.

At the heart of *Born to Rebel*, a pioneering inquiry into human development, is a fundamental insight: that the personalities of siblings vary because they adopt different strategies in the universal quest for parental favor. Frank J. Sulloway's most important finding is that the eldest children identify with parents and authority and support the status quo, whereas younger children rebel against it. Drawing on the work of Darwin and the new science of evolutionary psychology, he transforms our understanding of personality development and its origins in family dynamics.

Most persuasively, Sulloway's findings offer conclusive evidence that the family, with its powerful interpersonal dynamics, is a cauldron for the great revolutionary advances that drive historical change. Through his analysis of revolutions in social and scientific thought, from the Reformation to Darwin's theory of natural selection, Sulloway demonstrates that the primary engine of history is located *within* families, not *between* them, as Marx believed.

—from Pantheon

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