

Seamount serendipity in the South Pacific

Last week, good fortune erupted under a U.S. oceanographer when the underwater volcano he was studying began to spew out molten rock and gas — a right-time-right-place occurrence that will help reveal the sources of different types of volcanism and may aid scientists in understanding how volcanic islands rise out of the ocean.

"This represents a significant scientific discovery," says Michael Garcia, a volcanologist from the Hawaii Institute of Geophysics in Oahu. "We've never witnessed one of these hotspot-type volcanoes erupting."

The volcano that erupted was the MacDonald seamount, located in French Polynesia, 700 miles west of Pitcairn Island. From the ocean floor, 5 kilometers below the surface, the seamount rises to a summit that is only 40 meters deep.

Harmon Craig, the oceanographer who observed the eruption, was serving as the chief scientist aboard the research vessel *Melville* and had visited the MacDonald seamount in order to retrieve water and rock samples from the volcano.

When the *Melville* arrived at the seamount, Craig and the crew observed "large patches of greenish-brown water," indicating recent activity. Then, as they started to perform some experiments, the seamount erupted. "Large gas and steam bubbles burst at the surface with chocolate-colored water and, best of all, steaming lava balls too hot to hold in bare hands," Craig said in a report radioed to his home base at the Scripps Institution of Oceanography in La Jolla, Calif.

The bubbles made "horrendous clangs and clamors" as they burst under the hull of the *Melville*. During the eruption, the ship's depth recorder and another instrument broke down. No injuries or other malfunctions were reported.

The MacDonald seamount is at the end of a 2,000-kilometer-long chain of islands and seamounts. Scientists believe these features have sprouted up one at a time over tens of millions of years as the Pacific plate has slowly passed over a so-called hotspot, where magma, or molten rock, from the deep interior of the earth is thought to rise toward the surface.

Hawaiian geophysicists discovered the seamount in 1967 when some underwater microphones picked up sounds emanating from a usually quiet part of the South Pacific. They speculated that the sounds came from the underwater eruptions of a previously unidentified seamount, which researchers visited two years later.

After last week's eruption, Craig was able to take samples of the new material, which is a glassy basalt filled with bubbles of trapped volcanic gas. In the past, Craig has examined the trapped gas in order to learn more about the source of the erupting magma. The new rocks are

expected to yield better samples of the volcanic gas than older rocks, which can partially degas after years in the ocean.

Magma from hotspots differs from the magma that forms the oceanic crust when it pours out of mid-ocean spreading centers. Scientists think hotspot material rises from deeper in the mantle and is therefore less "processed" than the spreading-center magma, which is thought to be remelted many times. By measuring the relative abundances of two helium isotopes in the volcanic gas, scientists can determine whether a vol-

canic sample has melted repeatedly.

"For people who are interested in the gas composition of magmas, and in particular those associated with hotspots, this would be a wonderful opportunity to look at what's coming out of the mantle of the earth," says Robert Duncan, an oceanographer at Oregon State University in Corvallis.

The chance observation will also help scientists understand the evolution of seamounts, which often become islands. Says Garcia, "Being there for an eruption gives us some understanding of how submarine eruptions occur. We've never witnessed one in [such] deep water."

— R. Monastersky

Mood swings and creativity: New clues

For centuries there has been speculation that creativity is somehow linked to "insanity" or mental illness, although scientific studies of the suspected connection are sparse. Nancy C. Andreasen of the University of Iowa College of Medicine in Iowa City now reports that, at least among a small group of creative writers, there is a close association between creativity and "affective disorders" such as depression and manic depression.

Reasons for this relationship remain unclear. "Nevertheless," says Andreasen in the October *AMERICAN JOURNAL OF PSYCHIATRY*, "affective disorder may produce some cultural advantages for society as a whole, in spite of the individual pain and suffering that it also causes."

During the past 15 years, Andreasen interviewed 30 faculty members at the University of Iowa Writer's Workshop, one of the best-known creative writing programs in the country. She also interviewed 30 control subjects of comparable age, sex and education, whose occupations included hospital administration, law and social work.

Andreasen found that 80 percent of the writers had had an episode of either severe depression or manic depression — either with a pronounced mania characterized by euphoria, increased energy and poor judgment, or a milder "hypomania" — at some time in their lives. Schizophrenia, marked by severe thought disorders, was absent in the sample, but 30 percent of the writers were diagnosed as alcoholic. Depression or manic depression occurred among 30 percent of the controls, and 7 percent were alcoholic. None of the controls was schizophrenic.

The writers also reported significantly more first-degree relatives with creative achievements in a variety of fields, including literature, art and music. The breadth of creativity in these families suggests that a "general factor"

predisposing to creative success may be genetically transmitted, says Andreasen. Average intelligence, as measured by several IQ tests, was virtually the same for writers and controls.

Andreasen's report follows a 1983 study by Washington, D.C., psychologist Kay Jamison of 47 top British artists and writers. More than one-third reported having sought treatment for depression or manic depression. Poets and playwrights in the study were most likely to have severe mood disorders or dramatic mood swings.

Twenty artists in France, including writers, painters, sculptors and musicians, are being examined by Kareen and Hagop Akiskal of the University of Tennessee in Memphis and psychiatrists at the University of Paris. The ongoing study consists of extensive interviews and includes 20 comparison subjects in other occupations.

"So far, the most striking aspect of the artists is their temperament, not the presence of major psychiatric disorders," says Hagop Akiskal. "Since their teens and 20s, they've been moody people with emotional ups and downs."

Nearly 70 percent of the artists have some type of affective disorder, notes Akiskal. The most common diagnoses are a moderate form of manic depression or even milder, intermittent periods of mood swings. More severe mood disorders, he says, probably disrupt an artist's career.

Furthermore, a recent study of 750 psychiatric patients in Memphis conducted by the Akiskals found that those with mild manic depression or mood swings were more likely to be creative artists. But the same diagnoses also appeared in excess among people who were successful in business and leadership positions, says Hagop Akiskal. Studies of creativity and affective disorders need to consider distinguished people who are not artists, he points out.

— B. Bower