

Volcano Myths and Rituals

John Dvorak

WE WERE ASSIGNED the job of monitoring the increasing activity of Galunggung volcano in western Java, one of the most densely populated areas of Indonesia. But we had practically no equipment—just a scrounged seismometer and a single geophone (a sensor for picking up higher-frequency ground vibrations). These were installed a few hundred feet outside the village where we were staying, about two miles from the crater. A surveying instrument, a standard tool in volcano research, had arrived from the United States, but from my previous experiences I knew it would take weeks before the shipment would clear customs. In the meantime, as the only Westerner working with members of the Volcanological Survey of Indonesia, I spent my days with dozens of Indonesian counterparts documenting the effects of the eruptions and, when possible, helping to evacuate people. At night I slept alone in a tiny room furnished only with a bed, a small table and a kerosene lamp.

As soon as the surveying gear cleared customs, I rushed to Jakarta to pick it up, returning the next night. The boxes were placed in my room. Sometime after I fell asleep, I was awakened and asked whether a visitor could see the equipment. I said yes. The lamp was lit, and I watched as a teenage boy guided an elderly woman into the room. From the way she moved, it seemed she was blind. The boxes were opened, and the woman ran her hands over the equipment.

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Differing views of the universe add to the challenge of dealing with natural disasters

The next day, as my colleagues and I started unpacking things, I noticed a small green bundle in one box. Picking it up, I saw it was a tightly folded leaf with something inside. I examined this curious package and asked what it was. One of the Indonesian geologists told me that it was a coin left by the woman—that she wanted to wish us luck in studying the volcano.

Two months and several explosive eruptions later, I was back in Jakarta, preparing to return to the United States. I described these strange events to an Indonesian friend who smiled and said I had the story wrong. The old woman was not wishing me well; she had come to make sure the newly arrived equipment would not alter the course of eruptions because, as she and other local people knew, volcanoes do not spew things out without reason. They bring justice and vengeance to the world.

Although it took place a quarter-century ago, I often think about this episode because, after years studying volcanoes, it reminds me how differently people perceive eruptions—and natural disasters in general. To someone educated in Western science, the failure of people to evacuate in the face of an impending eruption seems irrational. But geologists cannot yet answer the two questions most important to people who are in such peril:

When will the volcano erupt, and exactly what will happen when it does? So they often look to others—shamans and priests—for the answers to two slightly different questions: Why did the volcano erupt, and what do I do now? The response to the first query is invariably based on myth, and the answer to the second is always to follow some traditional volcano ritual. That people accept such advice frustrates and often astounds scientists.

For example, in May 2006, at Merapi volcano in central Java, both Indonesian and foreign volcanologists warned the locals that a growing lava dome could collapse without warning, sending a deadly, red-hot cloud of ash down the side of the mountain. Meanwhile, at a nearby village, holy men and hundreds of their followers lit incense and placed rice and fruit and other offerings in small, makeshift boats, then sent the miniature flotilla down a river. It was a ceremony to prevent their villages from being destroyed by the volcano.

A news story about the eruption in *Science* reported that officials were having trouble persuading the villagers to clear out. Instead of listening to geologists, the people were relying on spiritual advisers for guidance—prompting one scientist to note, somewhat incredulously, “The level of risk people are willing to tolerate here is remarkable.” Added to that was a comment by Richard Stone, the journalist who wrote the article, calling the failure of people to evacuate in the face of such certain danger “obstinacy.”

Rational Mysticism

To try to understand such seemingly irrational behavior, I have spent years compiling a list of myths and rituals associated with volcanoes. I have found them described in a variety of sources,

including travel writings, religious documents, newspapers articles, even occasional references in scientific journals. I now have hundreds of such accounts for dozen of volcanoes.

Examining this collection as a whole, the first startling result is that not all cultures view volcanic eruptions as destructive. For example, in Africa, the volcano Oldonyo-Lengai, literally "Mountain of God," is venerated by the Maasai as the giver of all good things. In gratitude for an eruption in 1917, young mothers went to the volcano and expressed their breast milk on the ground. People who live near Mayon in the Philippines, around Agung on Bali and on the flanks of Maderas in Nicaragua are well aware that the eruption of volcanic ash greatly enriches the soil, giving better crops. In Hawaii, eruptions are viewed as beneficial, as acts of creation, and Hawaiians often see their lives mirrored in the level of volcanic activity.

On those islands, an eruption usually begins with lava gushing from a long crack in the earth. The hot, highly fluid material leaves a smooth, skinlike texture along the eruptive fissure. Because the structure is reminiscent of a huge vagina, native Hawaiians traditionally regarded an eruption as the menstruation of the goddess Pele, with the red lava always flowing toward the sea, the same path taken in ancient times by women to cleanse themselves. These Hawaiians oppose any attempt to control an eruption by diverting the flow of lava, as scientists have often urged. To them, it would be as unnatural as somehow trying to force a woman to end her menstruation.

The notion that an eruption is an instrument of justice (a view evidently held by the elderly woman I encountered in Java in 1982) is a common one. To the Aztecs, who were suffering under the conquistadors, Momotombo, a high cone located at the edge of a large lake in Nicaragua, was the symbol of defiance. It was said that the ground shook and the volcano roared whenever a Spanish priest tried to approach it. The Aeta, an indigenous people living on Luzon in the Philippines, considered the 1991 eruption of Pinatubo as nature's rebellion against the government's granting of permission for geothermal drilling and for jets from nearby Clark Air Base, then the largest U.S. military base overseas, to use the area for bombing practice.



Many of the villagers living around the volcano appealed to priests and shamans during the 2006 eruption of Mount Merapi in western Java.

Many cultures also consider an eruption to be a warning. In 1951, village elders said that the explosion of Hibok-hibok on Camiguin Island, the Philippines, which killed hundreds of people and thousands of farm animals, was an indication that "God had been displeased by young Camiguenos who grew lax in their churchgoing, forgetful of the feast days, and neglectful of the sign of the cross." In 1980 at Mount St. Helens, two Christian priests in Longview, Washington, told their parishioners that the ongoing volcanic activity meant that people should be more charitable and more caring of their families, that it was directing the community to get "back to its spiritual moorings."

Such reactions, though they may be anathema to science, cannot be dismissed. Anthropologists no longer regard myths as naive views of nature that retreat from consciousness as science advances. These supernatural explanations still hold powerful sway, not because they are factual, but because they represent people's core beliefs. Myths are much more pervasive and play a greater role than previously thought in all societies, even highly scientific ones, such as our own.

Humility and Utility

The widely differing views of volcanic eruptions can produce a disconnect between the scientists who are trying to understand and predict them and the people who are directly affected. I am concerned that this problem is becoming worse as remote sensing is used more and more to study active volcanoes. Now, in many cases, through the use of space radar and satellite relays, geophysical data can be received and analyzed in places far from the site of volcanic activity, say, by scientists in Baltimore, Pasadena or Houston, who have little, if any, sense of how their work might be received by people who are dealing with the eruption up close.

I have no clear solution for how the volcanologists who use the latest technology can bridge the gap with those who stand to benefit from their work. Being more culturally aware might help, but that is only a start. More important, we must check our tendency to assume that all that people need are scientific assessments of the perils they face. Myth and ritual also help them to cope with disaster, albeit in a very different way.