Colombia volcano: What next?

In the valleys below Nevado del Ruiz, the effects of the Colombian volcano's eruption last week have been devastatingly clear. Torrential floods of mud and water, triggered when two blasts Nov. 13 melted snow and ice crowning the mountain, raged down the volcano's steep northeast flanks at speeds of up to perhaps 90 miles per hour and flowed into river channels, engulfing the town of Armero and killing more than 22,000 people. But as to the volcano itself – how the blasts occurred, if there were precursory signals and whether the volcano is gearing up for more eruptions – scientists have been considerably less certain.

"We really don't know what happened on the mountain yet," says Patrick Muffler of the U.S. Geological Survey (USGS) in Menlo Park, Calif. "Before we can ask the scientific questions, we need hands-on knowledge" of the volcano.

And that is just beginning to happen. Darrell Herd of the USGS in Reston, Va., was able to fly over the volcano last weekend in spite of bad weather. According to USGS colleagues, he saw mudflows in all valleys draining the volcano and spotted two separate plumes within the enlarged crater. He estimated that only about 5 percent of the snow and ice had melted during the eruption, so the greatest worry is that more mudslides could be triggered even if the volcano remains relatively tame. Based on the behavior of other subduction zone volcanoes (which are driven by the melting of an oceanic plate as it descends under a continent) such as Mt. St. Helens, scientists say the chances of another large eruption soon are not great. But they really can't be sure. That is why they have begun to set up real-time monitoring of the seismic rumblings and deformation of the volcano. Two teams of USGS specialists, for example, arrived in Colombia last weekend with 3,000 pounds of equipment to replace and upgrade the seismic stations that had been placed on the volcano when it first began to release steam and ash on Sept. 11.

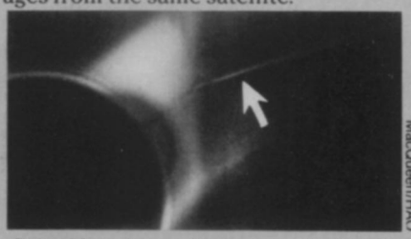
On a broad geologic time scale, the eruption was not a surprise. Herd had shown in 1974 that major eruptions of Nevado del Ruiz occurred about every 300 years, and since the last large blast took place in 1595, another was due. The Sept. 11 eruption of steam and ash was another clue that alerted the Colombians. It also produced a relatively small mudslide, which raced down the volcano so fast that it leaped across waterfalls and ran up the sides of the channel bobsled-style, according to Herd.

Hazard maps, drawn up in October as a result of studies conducted by an international team, apparently predicted very well where the November mudslides would occur. But the eruption happened before the Colombians could implement emergency plans, says Herd. USGS scientists still don't know whether there were recognizable precursory signs in the days prior to the eruption. Compared with many other places, "there's virtually no volcanic monitoring in South America," notes Muffler. Adds Herd, "I'm sure this eruption will heighten Colombian, as well as international, concern about the potential for other possible dangerous volcanoes. . . . Are there some long-term lessons that we can learn from this tragedy that can be applied elsewhere?"

– S. Weisburd

Two more sun-grazing comets discovered

The Air Force satellite that was deliberately destroyed Sept. 13 in a test of the U.S. anti-satellite system (SN: 9/28/85, p. 197) was probably best known for its discovery of three previously unknown comets whose orbits took them so close to the sun that they failed to reappear on the other side – presumably due to the sun's heat – following the initial observations. Now two more sun-grazing comets have been reported in later images from the same satellite.



MacQueen/HAO

Solar Max photo of Comet "SOLWIND 5."

All five were discovered by the P78-1 satellite's coronagraph/polarimeter, a Naval Research Laboratory instrument named SOLWIND, which had been monitoring the sun's corona since the craft was launched on Feb. 24, 1979. It found its first sun-grazer only six months later (SN: 10/17/81, p. 244), and two more in January and July of 1981 (SN: 8/21/82, p. 117).

SOLWIND's data are not processed immediately, however, and one of the two new finds was actually photographed on Nov. 4, 1981. The other showed up on July 28, 1984. Both appeared in the coronagraphic images as they approached the sun, which was masked by the instrument's occulting disk, but neither emerged on the disk's other side in subsequent frames. The assumption has been that the comets either collided with the sun or were destroyed by its heat.

The sun-grazing comets are named SOLWIND 1 through 5 (though SOLWIND 4 and 5 are so far only tentative names, pending International Astronomical Union approval). None has been reported by ground-based observers. SOLWIND 5, however, was also photographed by the coronagraph aboard the Solar Maximum Mission satellite, or Solar Max. Solar Max was not launched until Feb. 14, 1980, so it was unavailable to see SOLWIND 1, and it missed the next three chances because blown fuses kept its coronagraph and several other instruments shut down until space shuttle astronauts administered repairs in April of 1984, just three months before SOLWIND 5 came by the sun.

The only other comet seen by Solar Max, says Robert MacQueen of the High Altitude Observatory in Boulder, Colo., was Comet Machholz, photographed last summer to try aiming the coronagraph away from the solar disk in preparation for similar studies of Comet Halley when it is near the sun early next year.

Meanwhile, more than two years of SOLWIND's data remain to be processed, with more sun-grazers perhaps to be found.

– J. Eberhart

Laskers awarded

The judges for this year's Albert Lasker awards dipped into the well of medical talent and came up with two basic researchers, a surgeon, a chief executive officer of a charitable organization and a newspaper columnist.

As happened last year, the basic research award, announced this week, was a reprise of the Nobel Prize in medicine (SN: 10/19/85, p. 246). This year's double laurel winners are Michael S. Brown and Joseph L. Goldstein at the University of Texas in Dallas.

The winner in the clinical division is Bernard Fisher, a professor of surgery at the University of Pittsburgh. Fisher's award is for basic and clinical advances in the study of breast cancer. Last spring Fisher reported that for many women, partial, rather than total, removal of a cancerous breast is sufficient (SN: 3/16/85, p. 165).

Public service awards went to Eppie Lederer and Lane W. Adams. Lederer – better known by her nom de newspaper, Ann Landers – was cited for writing "one of the most respected and influential human relations columns in the history of journalism." Adams, chief executive officer of the American Cancer Society, was honored for "stimulating the growth of the society" over the past 25 years.

Brown and Goldstein share $15,000; the others each get $15,000. □