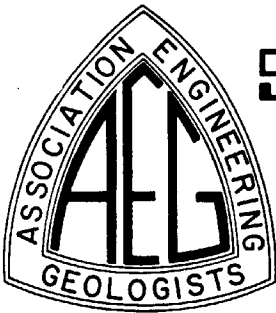


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SOUTHERN CALIFORNIA SECTION

news letter

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MERRY CHRISTMAS!!!

DECEMBER MEETING

- DATE:** Tuesday, December 10, 1985
- PLACE:** Stevens Steak House
5332 Stevens Place
Commerce (T.G. 53 F2)
- COST:** \$13.00 (Tip included)
- RESERVATIONS:** Kovacs-Byer & Associates, Inc.
818-980-0825
Please make reservations by noon on previous
friday.
- TIME:** 5:30 Social Hour
6:30 Dinner
7:30 AEG Business
8:00 Speaker
9:00 Section Affairs, if scheduled
- SPEAKER:** Jack Eagen, Senior Vice President and manager
of operations for Moore and Taber. Mr. Eagen
is responsible for the overall direction and
coordination of all Moore and Taber operation
divisions, including Bakersfield. He
received a BA from UCLA in 1955 and has
performed graduate studies at UCLA and USC.

RESIDENTIAL STRUCTURE DISTRESS CAUSED BY GYPSUM GROWTH

Structural distress to residential homes in a section of the Santa Monica Mountains has been attributed to the growth of gypsum crystals between bedding planes of the carbonaceous shale of the Modelo Formation. Weathering and geochemical alteration of fine-grained iron sulfides (pyrite) in the shale, in combination with dissolved calcium, has produced secondary hydrous calcium sulfate (gypsum) having a much greater volume. The reaction creates pressures that can cause differential heaving, uplift, and attendant structural damage. Structures of conventional raised floor design appear to be most susceptible to this distress. Jack will welcome comments, contributions, and case histories.

BULLETINS

Please note the dues statement enclosed with this newsletter. As advertised in the last newsletter its time to break out the checkbook.

Dr. Bruce Clark of Leighton and Associates has recently returned from a symposium held at Lawrence Berkeley Laboratory, Berkeley, California. The syposium, titled "Coupled Processes Affecting the Performance of a Nuclear Waste Repository", brought together researchers, scientists and project teams from major international nuclear waste disposal sites to examine the latest research on the subject and their ability to create computer models to predict the effect of changing many different factors.

A GSA symposium on Engineering Geology and Soils Engineering is being held in Boise, Idaho on February 26-28. Information: Spencer H. Wood, Dept. of Geology and Geophysics, Boise State University, Boise, ID 83725; (208) 385-1631.

Professor Martin Stout, CSULA, Member of State Registration Examination Committee, 213-224 3767--224-3388: " We've all heard (or made) comments... the registration exam was too hard, the questions were bad (ambiguous, not answerable, etc., etc.). You've also heard me ask for input for this exam. This is yet another request. I believe that the entire exam is incredibly stale--same questions asked in some dubious cyclic nature, but this is all entirely dependent on input from you. My request is for all of you who have taken the exam to come up with better problems--good examples from your own practice to make getting the questions together easier for you and also practical. We don't have any trouble with multiple choice questions, but there is a definite need for problem type questions. How about it??? I'll report back to you what the response is to this request."

Engineering Geology Abstracts: \$20.00 (\$16.50 if member of CGS AEG IAEG GSA), send to Kay Yost, American Geological Institute, 4220 King Street, Alexandria, VA 22302; 703-379-2480.

EMPLOYMENT OPPORTUNITIES

Staff/Project Level Engineering Geologist: Immediate opening for one engineering geologist with a growing Southern California geotechnical firm. Minimum requirement of two to three years professional experience with hillside development, excellent technical and communication skills, essential. Competitive salary commensurate with experience, comprehensive employee benefits including profit sharing program. Send resume with references, in confidence, to: William Cavan, Gorien and Associates, Inc., 766 Lakefield Road, Suite A, Westlake Village, CA. 91361.

Hydrologist: Rapidly growing Southern California engineering firm seeks young but highly qualified hydrogeologist with recent exp. in assessing underground petroleum hydrocarbon contamination. Successful candidate will have strong academic credentials and excellent people skills. Attractive compensation package appropriate to qualifications. Resume in confidence to : J.T. Alton Inc., 16510 Aston St., Irvine, CA 92714.

But They Didn't Know When Volcano Would Erupt

Geologists Had Predicted Devastation

By THOMAS H. MAUGH II, *Times Science Writer*

Geologists had predicted within the last month that the Nevado del Ruiz volcano, which had been rumbling and belching steam for nearly a year, would erupt and cause widespread devastation, but they had no way of knowing exactly when that would happen, U.S. Geological Survey officials said Thursday.

Hazard maps prepared in October by an international team of scientists "fully anticipated what happened," Darrell Herd of the Geological Survey's Office of Earthquakes, Volcanoes and Engineering said in a Washington press conference Thursday.

Herd noted, however, that there was no seismic or geological evidence that would have allowed scientists to calculate the precise date of the eruption, and there was no negligence on the part of Colombian government officials.

Herd also said that it is likely that "there will be additional eruptions from (Nevado del) Ruiz, although not necessarily of the same severity." He predicted that the activity "would continue for several days before it abates." In Bogota, the Colombian capital, sci-

entists said that lava began to flow Thursday afternoon from the crater.

Scientists first began watching the 17,716-foot volcano in December, 1984, when increased seismic activity and small releases of steam were observed. Similar activity had been observed since the volcano's last major eruption in 1595, but such occurrences are common and usually inconsequential, according to David Norris of the Geological Survey office in Pasadena.

There was a small steam blast last March and a much larger blast and ash eruption on Sept. 11. The September blast was accompanied by a mud flow, between 60 and 70 feet wide, that traveled about 20 miles down the Acufrado River valley at speeds of "tens of miles per hour," Herd said. That blast, he said, indicated that a larger erup-

Please see PREDICT, Page 22

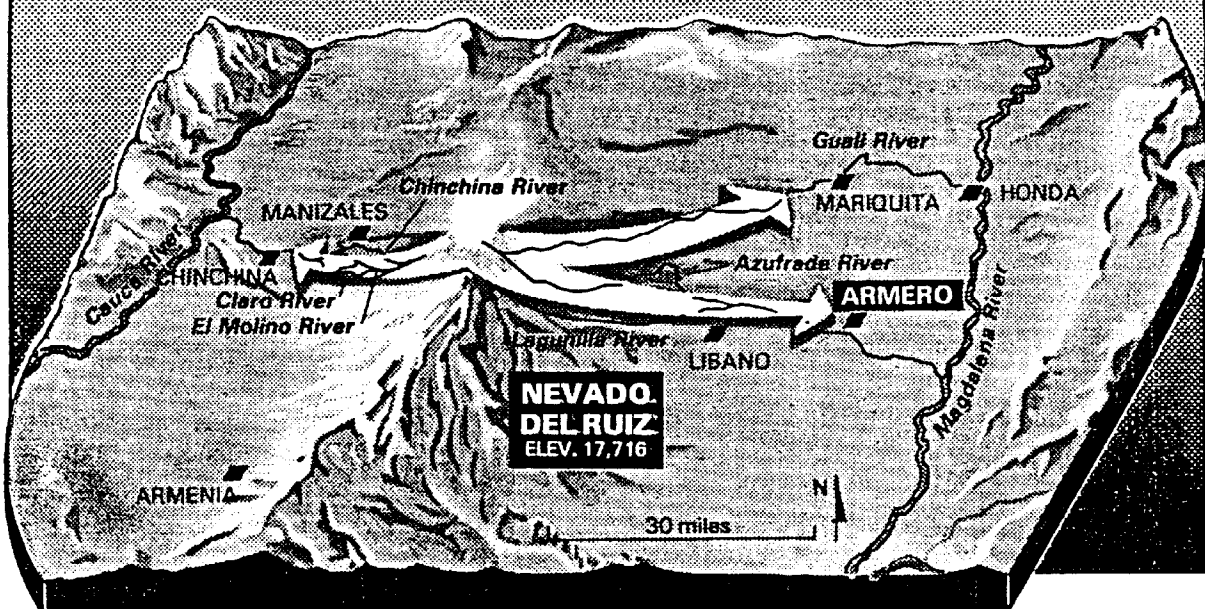


THE PATHS OF DESTRUCTION

Mud from the west side of the volcano floods the Claro River, inundating a small town near Chinchina.

Additional mud blocks the Guali River above Mariquita, forcing the evacuation of Mariquita and Honda.

Mud and water flow down the Lagunilla River at avalanche speed, burying the town of Armero.



PREDICT: Geologists Saw Disaster Coming

Continued from Page 1

tion was likely to occur soon.

That mud flow caused no damage, but Colombian officials closed off the mountain and called in a team of geologists from the United States, Ecuador and Costa Rica to assess the hazard. Herd, who wrote his doctoral thesis on Nevado del Ruiz, was a member of the team.

Put in Seismic Network

The team began installing a seismic network on the slopes of the volcano, but their work was hampered by the steepness and ruggedness of the slopes. At the time of the explosion, a rudimentary system was in place, but there is no evidence that this system provided any advance warning of the eruption.

The team also studied the potential-effects of an eruption. Based on the team's work, several Colombian agencies predicted in October that there was a 67% chance that an eruption would produce flooding and mudslides of the type that occurred Thursday.

The report also said there was a 21% chance of a rock eruption, an 8% chance of a lava flow and no chance of a lateral explosion, blowing away the side of the mountain. The agencies had planned to issue a more definitive report at the end of November.

Fraction Reached Safety

Colombia's Mining Ministry Commission had said the town of Armero, which was destroyed by mudslides and overflowing rivers, could be "evacuated in two hours without danger" even if rivers rose 38 to 96 feet because mud moves slowly, according to wire service reports from Bogota.

When the volcano erupted in the middle of the night, only a fraction of Armero's residents managed to scramble to high ground or onto the roofs of their houses. Civil defense officials said there appeared to be about 10,000 survivors in the town.

In October, visitors in the area noted frequent tremblings on the

mountain and that the air was filled with sulfurous fumes. An average of 35 minor earthquakes a month have been reported at the site in the past year.

The Colombian government was in the process of preparing detailed emergency plans for an eruption when the disaster occurred.

"I suspect the eruption came too soon, before all the plans were implemented," Herd said. He also noted that a disaster might not have been prevented even if the plans had been completed, given the steepness of the slopes and the size of the ice and snow pack on the mountain.

Plates Collide

Nevado del Ruiz is one of the northernmost peaks in the Andes, a chain of mountains created from the collision of two plates on the earth's crust—the Pacific plate and the South American plate.

Those plates meet along most of the western coast of the Americas, producing what is known as the Ring of Fire, a region of intermittent volcanic and earthquake activity. Mt. St. Helens in Washington state, whose eruption in May, 1980, leveled an area of 150 square miles and killed 57 people, is also part of the Ring of Fire.

Like Mt. St. Helens, Nevado del Ruiz is a strata volcano, built up from successive releases of lava. The lava is molten rock produced by the intense heat and pressures generated when the South American plate slides over the top of the Pacific plate.

Internal Pressures

The eruption itself probably occurred near the summit crater called Arenas, Herd said. There is—or was—a steep wall on the northeastern flank of the mountain directly below the crater and above the headwaters of the Guali and Acufrado Rivers.

Herd speculated that internal pressures blew off part of the headwall, creating the mudslide that eventually inundated the town of Armero and dammed the Guali

Historic Volcanic Eruptions Listed

From Associated Press

Here is a list of some of the major volcanic eruptions through history:

—AD 79, Vesuvius, southern Italy, death toll unknown, Pompeii and two other towns buried.

—1669, Mt. Etna, Sicily, about 20,000 killed.

—1792, Unzen-dake, Japan, 10,452 dead from eruption and mudslides.

—1793, Laki, Iceland, 10,000 killed, including victims of ensuing famine and epidemics.

—1815, Tamboro in the East Indies, 12,000 killed; 80,000 died in ensuing famine.

—1883, Krakatoa, Indonesia, 36,000 killed from volcano and ensuing tidal wave.

—1902, Mt. Pele, Martinique, 29,000 killed.

—1902, Kelud, Java, 5,100 killed by ensuing mudslides.

Major eruptions in recent years:

—Jan. 21, 1951, Mt. Lamington, New Guinea, 4,000 people killed.

—Dec. 4, 1951, Mt. Hibok on Camiguin Island, Philippines, 475 killed.

—March 20, 1963, Agung, Bali, about 2,000 killed.

—May 18, 1980, Mt. St. Helens, Washington, 57 killed.

River.

Alternatively, he said, the pressures could have simply weakened the headwall, leading to a natural landslide that exposed the core of the volcano. Such a mudslide also triggered the eruption at Mt. St. Helens.

In either case, mud rushed down the river valley from an altitude of about 15,000 feet to near sea level over a distance of about 30 miles, traveling at avalanche speed. The wall of water and mud destroyed everything in front of it.

Given the state of knowledge about geology, Herd concluded, there was probably little more the Colombian authorities could do about the volcano. "It is my strong sense that the people (living in the area) were made well aware of the hazard."

Times staff writer Rudy Abramson in Washington contributed to this article.

1986 DUES STATEMENT

Dues for the Southern California Section of the Association of Engineering Geologists are now payable to the Treasurer, BOB ZWEIGLER. Your dues are used to pay for postage, printing of the newsletter, publication of field trip guidebooks, secretarial services, and section activities. The Section dues are \$13.00 per calendar year (\$4.00 for student members). Members who have not paid their dues by April will be dropped from the newsletter mailing list. You must be a member of the Association before you can join the Southern California Section, so be sure to pay your dues their also. Please return this entire form with your check payable to "Southern California Section, Association of Engineering Geologists" directly to the trasurer at the address below. If you have an address change, please notify AEG Headquarters in Short Hills, New Jersey. Thank you for sending your 1986 dues promptly.

NAME _____ Membership status: M AM SM AF

Indicate Preferred Address

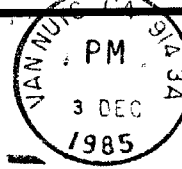
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Studio City, California 91064

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