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# EXPLORATIONS

By Susan Mazur

Until 1976, Guatemala, a country that has seen at least 200 major volcanic eruptions since the time of the conquistadors, had only two devices to predict earth movements: a sole seismograph and the premonitions of the wife of Don Claudio Urrutia.

"It was the quake that opened the Motagua Fault which really gave birth to seismology as a science in this country," says Urrutia, now director of the Institute of Seismology, Vulcanography, Meteorology, and Hydrology (INSIVUMEH), in Guatemala City. Urrutia does not, however, dismiss the significance of the stars in reading seismicity. Volcanic activity, he insists, follows the phases of the moon. Urrutia also notes that in recent years NASA has been accurately gauging significant seismic activity by comparing arrival times of quasar emissions from 1 billion light-years away. He jests that his role at INSIVUMEH is no coincidence, either, revealing that he was born under the tail of Halley's Comet on its last visible spin around Earth.

Urrutia's reference to the earthquake

that established INSIVUMEH was also the one that tore apart unprepared Guatemala on February 4, 1976. Its epicenter was along a 40-million-year-old, 150-mile-long fault, which carves a 3-mile-deep trench in the earth's mantle. Historically Central America's worst natural disaster, it sent a violent shock wave from Mexico to Costa Rica that registered 7.5 on the Richter scale.

"We now have twenty-seven radiotelemetric stations throughout the country," says Eddy Sanchez, chief seismologist at INSIVUMEH, "with two of our seismographs running on solar-charged batteries. Results are excellent, and plans are to equip all stations with solar-paneled seismographs."

Guatemala is also cooperating with neighboring Nicaragua, Costa Rica, and El Salvador in establishing a network of stations for reading and relaying information on the ocean plates bordering Central America. These grate against and underthrust one another, causing volcanoes and temblors. Sanchez says

that at least 58 sites will soon monitor the motion of the Caribbean and American plates to the east and the Cocos plate on the Pacific side, utilizing such instrumentation as the magnetometer to record magnetic change caused by rock deformation, the gravimeter to detect change in rock density, and the scintillation counter that measures radon gas as it escapes rock under pressure.

"We can measure distortion, tension, exactly. We know when a rock is going to break," Urrutia says. "We can predict close to the time the volcano will erupt. Microseismicity increases. Gravity changes. The volcano inflates. There may be fumes, rumbles, or magma extruding." But predicting the size of a volcanic eruption, Urrutia insists, remains an exclusive talent of his wife and other intuitive types. "You would be just as correct if you were to guess without instrumentation."

When will one of Guatemala's 33 volcanoes next erupt? Sanchez explains that three are erupting all the time. But it's the Santiaguito lava dome, in southwestern Guatemala's Sierra Madre range, that most excites him. "It's following a pattern of evolution similar to Mount Saint Helens. It's been erupting every day, and during the night the people of Quezaltenango can hear the rumbles and see the ashes pouring out."

Exploding from the Santa María crater in 1902, the Santiaguito cone began forming in 1922 and is now spewing forth lava. "It's a gray molten rock that looks like wet cement. The lava's boiling, but not yet red-hot," says Sanchez.

Santiaguito will exceed the height of its parent crater (3,768 meters) in about 200 years, at which time its growth will taper off. "There's a very good chance that we may see the triggering of another Mount Saint Helens-type eruption anytime after that," Sanchez, who considers these active volcanoes almost as his pets, predicts.

Fuego (3,835 meters), 45 kilometers west of Guatemala City, has been the country's most consistently active volcano in recent history. The last major eruption



Guatemala's most idyllic spot: Lake Atitlán, with volcanoes Tolimán and San Pedro in the distance.

Technology convenes at the Hyatt Regency Hotel, in Milwaukee. Some topics for discussion are: "Technology and Imperialism," "Public Visions of Technological Futures," and "Women in Technological History." Contact SHOT, Department of History, University of California, Santa Barbara, CA 93106.

**October 17-18.** Fortfest '81 features the Wonderplace—a magical realm of Fortean phenomena: spontaneous human combustion, Bigfoot and Nessie, people who vanish and others who appear, visions and miracles, poltergeists and occultism, psi powers, teleportation, wolf-children, relics of ancient technologies, UFOs, stigmata, levitation, antiquities and lost continents, and more. The extravaganza is topped off by a gala masked ball. Contact the International Fortean Organization, 7317 Baltimore Avenue, College Park, MD 20740.

**October 19-31.** A major exhibition of hundreds of paintings by *Omni* artists opens at Marshall Field's store, in downtown Chicago. Some of the featured artists are Ron Miller, Vincent DiFate, H. R. Giger, Gilbert Williams, Dean Ellis, and Don Dixon. The exhibit explores a major theme, space art, and several other genres, including visionary art, science-fiction art, and the art of contemporary realism. The paintings and prints will be on sale. Contact Jerry Howard at 312-781-5497.

**October 23-December 5.** "A Vision of the Future, the Art of Robert McCall" is a major retrospective with new works by a leading space artist often showcased in *Omni*. The 200 pieces of science, science-fiction, and fantasy art make up one of the largest one-man exhibitions of this kind ever assembled. Famed for his work on *2001: A Space Odyssey* and for his *Cosmic View* mural at the National Air and Space Museum, McCall continues to document and foresee the Space Age. Contact Scottsdale Center for the Arts, in Scottsdale, Arizona, at 602-994-2301.

**Until October 25.** "Edison and the Electrical Age" is an exhibition in Carterville, Illinois, honoring the invention of the incandescent light bulb. Electrical artifacts and period photographs set Edison's work in historical perspective. The development of electrical power is chronicled from a simple system run by one man to an increasingly large and complex network. The exhibition also traces the Wizard of Menlo Park's career from wandering telegrapher to world-renowned inventor. The light bulb is explored in detail with several experimental bulbs and filaments on display. Contact John A. Logan Community College at 618-549-7335.

**Until October 25.** "Jupiter and Its Moons" is a presentation in Canfield, Ohio, of transmissions received from the two Voyager missions that passed Jupiter in 1979. Some of the most stunning imagery yet to come

from deep space is enhanced by new data on Jupiter and its satellites. The exotic discovery of a new moon, the detection of the suspected Jovian ring, and the finding of active volcanoes on Io and the incredible turbulence surrounding the Great Red Spot are some of the exciting aspects of the Voyager project. Texts by Dr. Robert Wolfe, a geologist at the National Air and Space Museum, project the elation of the Voyager missions. Contact Farragher Marketing Services at 216-533-3347.

**October 31-November 29.** "Biological Photography," in Kansas City, Missouri, captures and preserves significant biological events for present and future study. The 50 black-and-white and full-color photos afford the viewer a glimpse of biomedicine and a look through the microscope. Subjects range from crystal photomicrography to sand crab portraits. Contact the Kansas City Museum at 816-483-8300.

**After November 1.** "Aerial Aircraft Carriers" is an exhibit at the National Air and Space Museum, depicting, through film footage and photographs, attempts to use aircraft (including balloons and airships) to carry other aircraft. Contact the National Air and Space Museum, in Washington, D.C., at 202-357-1552.

**Continuing.** "The Place Called San Mateo," at the Coyote Point Museum, in San Mateo, California, presents a new concept in environmental/educational displays. The multilevel exhibition follows ecological principles through such ecosystems as marshes, coniferous forests, chaparrals, broadleaf forests, grasslands, and coastal regions. The program evaluates the impact of man and industry on nature's cycles and rhythms. Contact the Coyote Point Museum at 415-342-7755.

**Deadline December 1.** An opinion survey is being organized to determine whether the publishing industry is underestimating the tastes and interests of science-fiction readers. *The Patchin Review*, a new magazine of SF commentary and criticism, wants to know what readers value most. Are book editors serving their needs? If not, what's wrong? Anyone interested in answering those questions should send his or her answers (up to 500 words, typewritten) to: *The Patchin Review*, Department O, 9 Patchin Place, New York, NY 10011. The most noteworthy essay will be selected by prominent persons in the SF field and will be published in full. Each entry must be accompanied by a stamped, self-addressed envelope.

**December 14-16.** The fourth Miami International Conference on Alternative Energy Sources provides the latest information on the search for new, clean, and abundant energies. The event, held in Miami Beach, Florida, includes sessions on synthetic fuels, wind energy, hydropower, tide power, nuclear fusion, ocean-thermal energy, wave energy and coal gasification and liquefaction. Contact Clean Energy Research Institute, University of Miami, P.O. Box 248294, Coral Gables, FL 33124. ☐

occurred in 1975, destroying a school and the marketplace of a nearby village. Its slopes are covered with sand and ash. It has also been growing in recent months and in January of this year began to tilt to one side after a small eruption. It is constantly smoking.

Fuego is accessible to climbers, though, as is Pacaya, Guatemala's smallest (2,250 meters) and most often scaled volcano. Pacaya is particularly feisty during December and January, spurting lava and fire, producing a red glow in the night sky in nearby Guatemala City. On February 18 Sanchez first noticed a dome emerging from the old Pacaya crater. The cone is now at least 50 meters in height, with a base 70 meters around.

It is even worth trekking to the top to see this red inferno and to hear the cellophanelike crackling of rock collapsing under intense pressure. Take a reliable guide and equally trusty four-wheel-drive vehicle. Make sure the front-wheel drive is working particularly well, since you'll be climbing steep gullies strewn with pumice and age-old chunks of sharp lava. Pack a couple of spares, too. Volcanic rock will bald tires faster than you can say *Chichicastenango*. Start out around 6 A.M. and take the road near Lake Amatitlán. You can make the ascent by car in an hour, with about 20 minutes more by foot to the top. Clouds appear by 3 P.M., and unless you're packed to spend the night, you'll want to head down the mountain. Also, it's best to climb during the dry season—November to May—and avoid the mud and heavy erosion.

Another volcano popular with climbers is Agua (3,766 meters), which has never erupted. You can climb Agua in two hours from the village of Santa María de Jesús, 15 kilometers south of Antigua. From its summit there is an excellent view of most of southern Guatemala.

Unquestionably the most beautiful spot in the country is Lake Atitlán, two hours into the mountains west of Guatemala City. Surrounding the mile-deep lake are three volcanoes—Atitlán (3,500 meters), Tolimán (3,025 meters), and San Pedro (2,975 meters). Each can be climbed in a day. Detailed maps of the region are easily obtained from the Instituto Geográfico Nacional, Avenida Las Americas 5076, Zona 13, Guatemala City.

Apart from abundant wildlife and romantic sunsets, such as can be found elsewhere only in Portofino or at Lake Como, there is hang gliding from the volcanoes, wind surfing on the 18-kilometer-long lake, and black bass fishing. Tourism is off considerably, and so Lake Atitlán is especially idyllic. Despite what you may read in the *New York Times*, the distant rumbling on the horizon is not apt to be caused by heavy artillery. There are no guerrillas in sight. ☐