

The Volcanic Drama at Montserrat

by Robert Decker and Barbara Decker

Montserrat, once known as the “Emerald Island” of the British West Indies, is entirely of volcanic origin, and is erupting again. It is part of the Caribbean Island Arc that has largely been built by at least 17 potentially active volcanoes. Two have notorious pasts.

In 1902, Mont Pelee on the French Island of Martinique, 150 miles south of Montserrat, erupted violently, killing 28,000 people in minutes. The pyroclastic flow which swept down on the port city of Saint Pierre was an especially bitter tragedy. Political elections were about to be held there, and even though the volcano had become increasingly active during the days prior to the great eruption, government officials assured the residents that there was no great danger. Worried that they would not be reelected if the city was evacuated, those officials were dead the next day along with all but two people who survived the volcanic holocaust.

In 1976, just the opposite occurred on the Island of Guadelope, 50 miles south of Montserrat. A small eruption of the volcano La Soufriere, and the memory of the Pelee disaster, led to a massive and expensive evacuation of 70,000 people. The eruption waned and scientists and politicians were blamed for their “cry wolf” alarms.

The wolf has now moved to Montserrat, and the question now is just how hungry is he. No recorded eruptions had occurred on Montserrat prior to the recent activity of the Soufriere Hills Volcano that began in July 1995. By November a large dome of viscous lava had grown in its ancient crater. As the dome began to break up and collapse, pyroclastic flows swept down the valleys whose heads were low places in the crater rim. A pyroclastic flow is a mixture of hot but solid lava fragments fluidized by expanding volcanic gases and heated air. It “flows” more like a dense, hot gas than a liquid, and can move at speeds well in excess of 100 miles-per-hour. Hot enough to melt glass, a pyroclastic flow is a nearly irresistible force.

The cycle of the lava dome growing, collapsing, avalanching, and exploding was repeated many times, and the slow increase in the size and destructiveness of the pyroclastic flows encouraged thousands of people to evacuate from the most dangerous places and leave the island. In June, 1997, larger pyroclastic flows killed 20 people. Some 4,000 people, about a third of the island’s original population, now seek refuge on the relatively safe northern end of Montserrat. Should they leave too?

The entire island is only 35 square miles in area. In the great explosion of Mount St. Helens in 1980 more than 200 square miles were devastated. If the ongoing eruptions at Montserrat remain similar to those that have already occurred, the pyroclastic flows will probably stay in the valleys surrounding the volcano and the north end of the island will remain relatively safe. That is the most likely forecast. But what if a huge eruption occurs that is similar to the giant 1991 explosion of Pinatubo Volcano in the Philippines? That is not likely—the largest eruptions are the least frequent—but it is not impossible. There is truth in the old saying that “Mother Nature always bats last.”

We have studied volcanoes for many years, and have seen great strides made in understanding how volcanoes work, especially during the past two decades. Nevertheless, new answers always pose new questions. That is the way science progresses.