

GENTLE GIANT AND VIOLENT KILLER: a tale of two volcanoes – Kilauea on Hawaii and Mont Pelee on Martinique. Report on talk given by Rob Hamson on Wed 22 Nov 2006

The writer visited both islands quite recently, Martinique in December 2005 and Hawaii in January 2006. Martinique was one of the ports of call on a Caribbean cruise while Hawaii was a stopover chosen with the aim of seeing an active volcano.

The differences between the two volcanoes are due to their location and so to the type of magma they produce. Kilauea is over a hot spot near the middle of an oceanic plate with basic or mafic magma which is fluid and mobile and readily releases the gases in it. Mont Pelee is on a subduction zone where the North American/Atlantic plate plunges beneath the small Caribbean plate. This is close to continental South America so a great deal of terrigenous sediment is present and the magma produced is acid or felsic. This magma is viscous and traps the gas in it, giving rise to violent explosions when the gas pressure is released.

The hot spot that underlies Hawaii has been in the same position for a long time – at least 100 million years. Volcanoes have popped up regularly as the Pacific plate has slid over it producing the Hawaiian chain and the Emperor seamounts beyond stretching all the way to the Aleutian trench where the plate subducts beneath Asia. Hawaii is a huge pile of basalt which when measured from the sea floor to the highest point, Mauna Kea (4205m) is roughly 9000 metres high. The present eruption point, Kilauea, has been continually active since 1983 and is the biggest eruption to have occurred in the last 500 years. It is only possible to see active volcanism from the air at the moment so we took a flight and saw bubbling lava in the crater of Pu'u'Ō'o as the plane banked over it. Unfortunately the audience at the talk were unable to see the same sight as my camera batteries chose that moment to die! Lava generally makes its way to the sea through lava tubes so on this occasion only the lava in the crater and the steam when it reached the sea were visible. The tag “gentle giant” comes from the fact that though 200 houses have been destroyed in the last twenty years, only a dozen or so people have been killed, two of these tourists who climbed into a steam vent hoping to experience a natural sauna. The only explosions to have occurred have been caused by ground water contacting magma. Fire fountaining can be quite spectacular as in 1959 when one from Kilauea reached 580m in height but these are easily avoided.

Mont Pelee came to international attention in 1902 when it exploded and killed virtually the entire population of 30,000 in the town of Saint-Pierre on the French island of Martinique. Seventeen ships anchored off the town capsized or caught fire and sank. Western volcanologists had never been on hand before to experience such a devastating event and the term “Peleean” went into the textbooks to describe such a violent pyroclastic eruption. The mass of glowing ash and gas hit the town at a speed of perhaps 500km per hour and killed all but two residents. The more celebrated of these was named Ciparis; he was imprisoned in a cell when the eruption struck and was badly burned. He survived four days before being found by looters and later featured in Barnum and Bailey's Circus in North America as “The Man Who Escaped Hell”.

The viscous felsic lava had blocked the vent of Mont Pelee leading to the enormous build-up of pressure which caused the explosion. The plug was visible before the eruption as an emerging spine which continued to rise after the event, reaching a height of 300m. In about a year it had crumbled away. Eruptions and smaller spines continued until the early 1930s.

Saint-Pierre, once dubbed the Paris of the Caribbean, has never fully recovered from the disaster and now has a population of 6500. The ruins can be viewed from a rubber-tyred motor train called the *Ciparis Express* and the Frank Perret Museum has scorched and welded relics from that terrible day.

Rob Hamson