



Human adjustments to the 1906 eruption of Vesuvius, Italy

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Mount Vesuvius is one of the most studied and dangerous volcanoes in the world due to its long eruptive history and its continued activity. Around 600 000 people live on its flanks and a further 3 million are estimated to be within range of a future eruption. The stratovolcano has shown many different styles of volcanic activity, ranging from high magnitude plinian eruptions to lower intensity strombolian and effusive activity. Observations from literate observers stretch back to the classical era.

The 1906 eruption of Vesuvius is well known for being an excellent example of a sub-plinian event, which had a significant impact on a densely populated area. Three phases of eruption are recognised. (i) On April 4, 5 and 6 lava flows were erupted from a number of vents that opened at progressively lower altitudes on the south-east flank of the volcano. Lava effusion was associated with moderate explosive activity at the summit which waxed and waned every few hours. (ii) On April 7 fire fountains reached a height of 3 km and lava destroyed part of the town of Boscorecase, with around 100 homes being destroyed in the suburb of Oratorio. Lava entered the church of Santa Anna and eventually came to a stop on April 8; 10 km from the cemetery at Torre Annunziata. (iii) On April 8 the central crater became the site of explosive activity, which increased in intensity. At 00.30 h there were strong explosions and an earthquake, and at 02.30 h there was a violent earthquake and the emission of a considerable quantity of ash, which covered the north-east sector of the volcano. The villages of Ottajano (now named Ottaviano) and San Giuseppe were badly affected, 216 people were killed and 112 injured by roof collapses caused by tephra, and a further 11 died and 30 were injured in Naples. When the paroxysmal eruption ended Vesuvius had been reduced in height by 115 m and the new crater was 700 m across and 600 m in depth.

This paper is based, *inter alia*, on the following historical records: (i) correspondence – both personal and official; (ii) economic records; (iii) newspapers and periodicals; (iv) contemporary photographs; (v) myths and legends and (vi) scientific papers and communication. Using these sources and others this paper will discuss human adjustments to the 1906 eruption through a day-by-day – and in important stages an hour-by-hour – chronology of the effects of the eruption on the local communities and the local authorities. Impacts on society included: roof collapses, disruption of food supply, laharic inundation and damage to the transport infrastructure which adversely affected the distribution of relief aid. The 1906 eruption highlights how difficult it was at the time to successfully manage a sub-plinian eruption. Today population density is much higher and, despite much better civil defence plans being in place, such an eruption would severely test the ability of the authorities, although they would no doubt have the benefit of a period of warning. Societal adjustments could facilitate more effective hazard prevention plans, through improved interaction amongst social scientists, civil defence authorities and the local communities.