

Reconstruction of the 1707 Hoei eruption of Fuji Volcano, Japan, based on historical documents

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The 1707 Hoei eruption of Fuji Volcano, Japan, is one of the most voluminous and explosive (plinian) eruptions in the whole history of the volcano. Many historical documents describe this eruption, because Fuji Volcano is located near Edo (old name of Tokyo). Previous volcanological researches were, however, few and careless about the reliability of each historical document. We carefully collected and read reliable documents, which describe natural phenomena associated with the eruption, and reconstructed the detailed sequence of the eruption. The sequence, which includes new findings, are summarized in the following:

- 1) Forty-nine days after the 1707 Hoei Tokai-Nankai Earthquake (M8.4), the Hoei eruption started shortly before noon on December 16, 1707, and lasted until before dawn on January 1, 1708. The duration is about 16 days.
- 2) Preceding the eruption, activity of small earthquakes had been felt near the volcano since December 3, 1707.
- 3) The preceding earthquakes became strong and frequent on December 15. In the night of the same day, these earthquakes were felt even in Edo, Odawara, near Iida (Nagano Prefecture), and Nagoya.
- 4) The eruption started at the southeast slope of the volcano (near the upper limit of vegetation) and opened the Hoei craters.
- 5) During 2-3 days after the beginning of the eruption, people felt abnormal vibration of doors and windows, which were caused by the infrasonic wave from the craters. This phenomenon was recorded even in Edo and near Iida.
- 6) Fallout particles changed from pumice/white ash to scoria/black ash at the evening of December 16.
- 7) Considering the descriptions of vibration, roll of thunder, eruption column, and severe ash-fall, the climax of the eruption can be regarded to be the period from the afternoon of December 16 to the morning of December 17. This estimate is concordant with the abundance of coarse particles in the lower part (units Ho-I and Ho-II) of the eruptive deposits.
- 8) Several lulls of eruption (shortly before the evening of December 16, the mornings of December 17, 18, 20, and 21, the daytime of December 23, etc.) can be identified from the descriptions.
- 9) Another rise of eruptive activity started in the evening of December 25. This estimate is consistent with the coarse particles abundant in the uppermost part (unit Ho-IV) of the eruptive deposits.
- 10) In the final stage of the eruption (from the night of December 31 to before dawn of January 1, 1708) , several explosions (rumbling and emission of volcanic bombs) were observed near the volcano.