

Merapi Eruptions and the Decline of Mataram Kingdom, 10th Century, in Central Java

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Introduction

- Merapi Volcano is well known as one of the most active volcanoes of Indonesia
- Its activities mostly creates disaster for the surrounding area
- There was a sovereign state in the Central Java, during 7th – 10th century, namely the Mataram Kingdom
- The kingdom declined after 10th century, and the cultural center of excellent of Java had been transferred to Singasari, Medang-Kahuripan, and Majapahit kingdoms in the East Java

Enigma of the Mataram Kingdom Decline

- Pucangan Inscription (1041 AD), “Maha Pralaya” : a great war, attack from the King Wurawari
- Disasters destructions:
 - Earthquake
 - Volcanic Eruptions

Mataram Kingdom Heritages

Prambanan Temple



Boko Palace



Plaosan Temple



Borobudur Temple



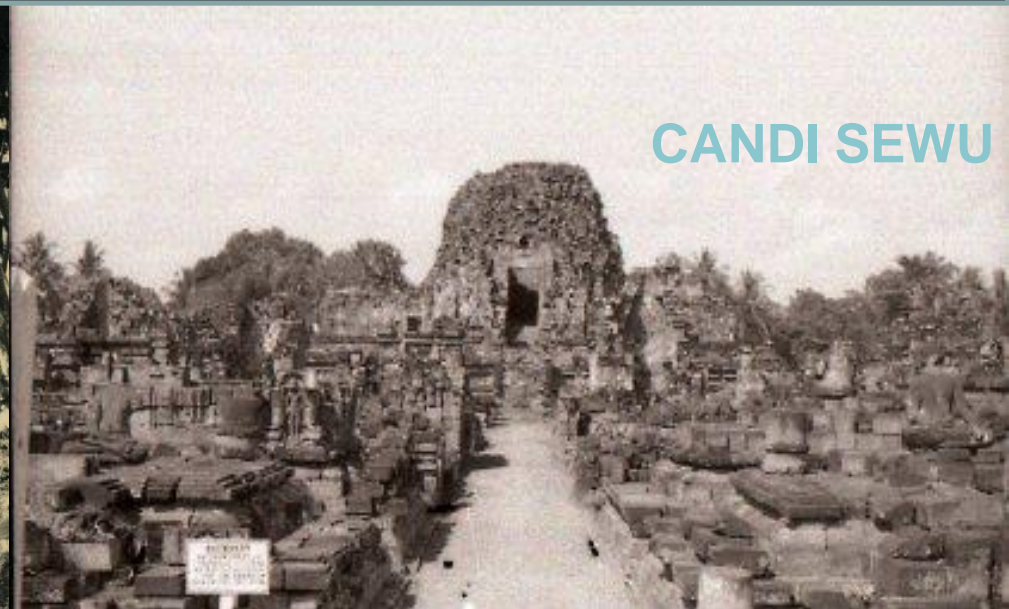


Borobudur Temple of the first discovery (Doc: BP3 Central Java)





Sewu Temple and Plaosan Temple of the first discovery
(Doc: BP3 Central Java)





Prambanan Temple of the first discovery Doc: BP3 Central Java

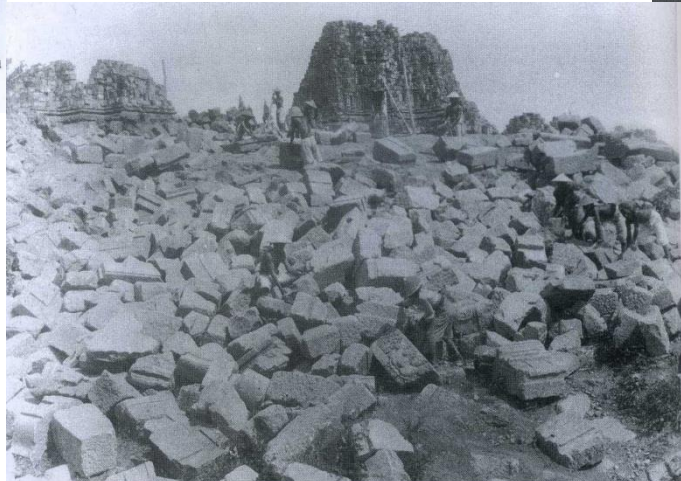
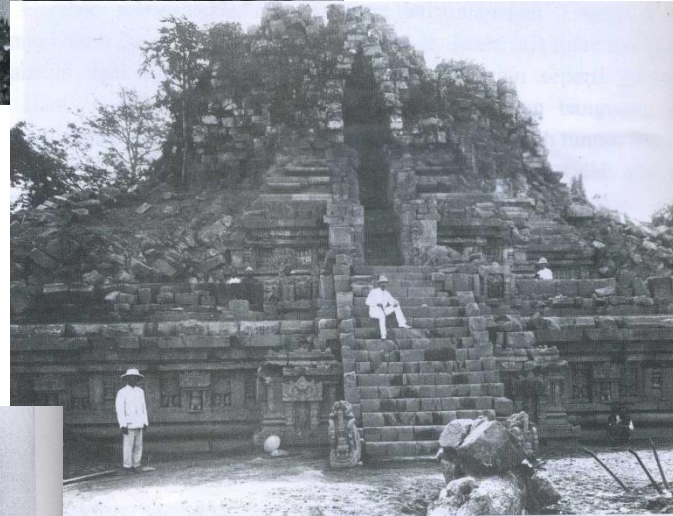


Foto 20. Para tukang Jawa sedang memeriksa tumpukan besar bebatuan.
(Foto OD 4018, direproduksi dari Djâwâ 20 ([1940].)

Foto 16a dan 16b. Puing-puing reruntuhan candi di Prambanan.
Gambar 16a dibuat oleh C. Springer, sekitar tahun 1852; Foto 16b diambil oleh
Woodbury & Page sebelum tahun 1880. (Sumber: KITLV/pictura-dp.nl)

Types of Volcanic Eruptions

MAGMA



Gas Pressure



V
i
s
c
o
s
i
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y

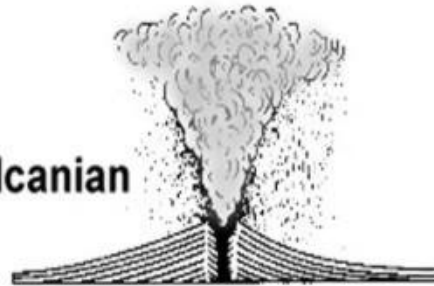
Hawaiian



Strombolian

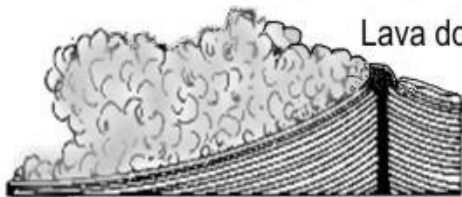


Vulcanian

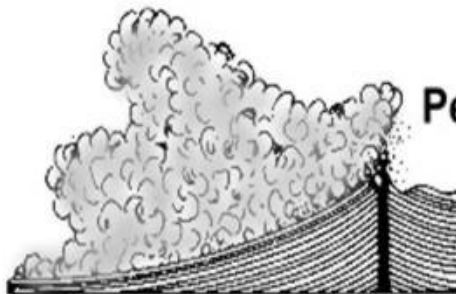


Merapi

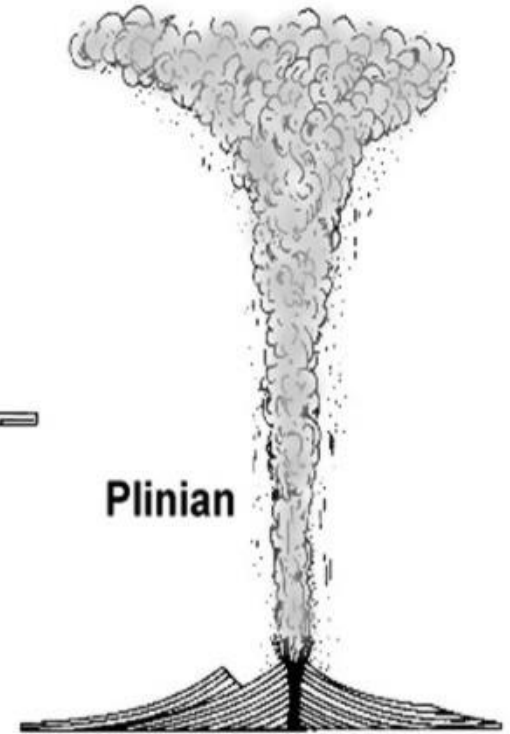
Lava dome



Pelean

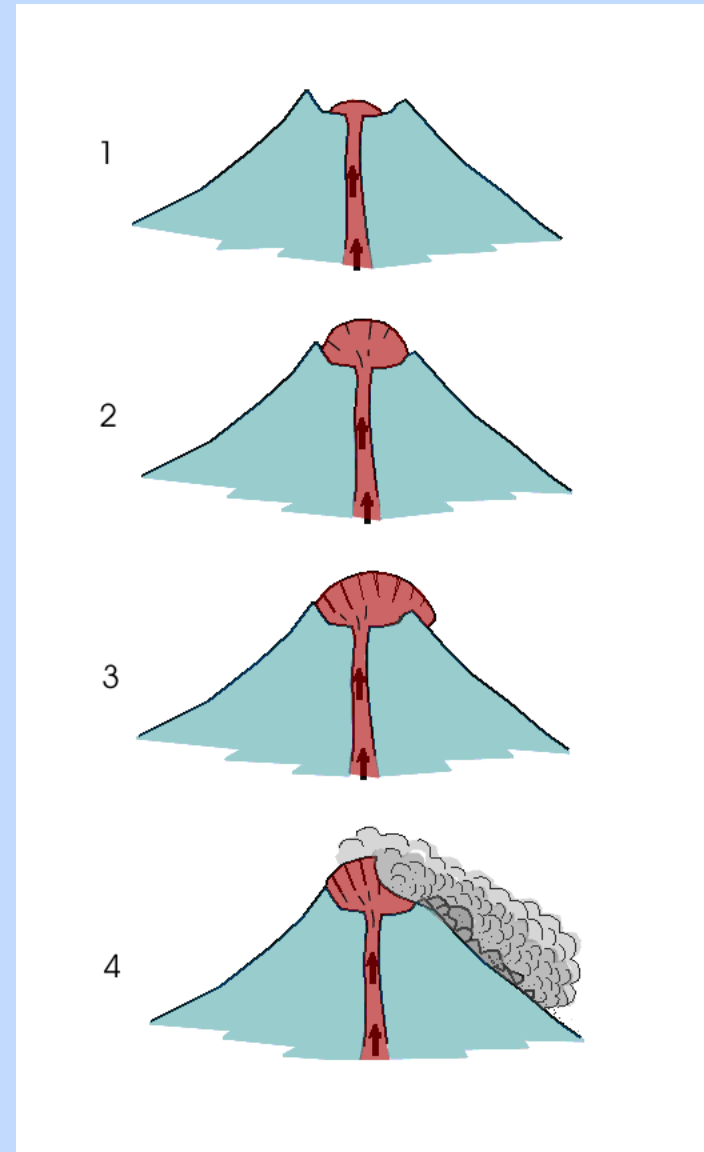


Plinian



Merapi Type

- Viscouse magma
- Low gas pressure
- Magma composition: andesitic
- Lava dome construction
- Nuee ardentes d'avalanches



Merapi volcanic history:

- Proto Merapi



- Ancient Merapi



- Middle Merapi



- Modern Merapi



Merapi eruptions characteristics: Changes



Eruption of 15 Mei 2006



Eruption of 5 November 2010

Merapi and Mataram Kingdom (7TH – 10TH Century)



Merapi Eruptions Tracks of 9th - 10th Century

Sambisari Temple



Kedulan Temple



Pustakasala Temple



Kadisoka Temple



Merapi 1994

Pyroclastic Flows,
Glowing Clouds,
6,5 km distant
to Kali Boyong,
64 people died



2006 eruption: Merapi Type

- “Woke up” after 5 years “sleeping”
- Previous pyroclastic flow was to the southwest direction
- Triggered by 27th May Yogyakarta earthquake
- Geger Buaya ridge collapsed
- Climax eruption: pyroclastic flow with 8 km distant to the south, burrying Kaliadem village

February 2006



13 May 2006



Merapi Eruption, 2006



Impact of 2006 eruption



2010 Eruption : Pelean Type



Impact of 2010 eruption



Impact of 2010 eruption



Secondary Volcanic Hazard: Lahar: Volcanic mud & debris flow



Lahar after 2020 Merapi eruption



Conclusions

- Merapi is among the most active volcanoes of Indonesia, its eruption characteristics generally change time by time
- Products of Merapi eruptions in the form of pyroclastic flows and lahar often cause disasters: damaging properties and bring about casualties
- Based on data related to the ancient heritages damage, and the reality of the impact of recent eruptions, and referring to the geological law of “the present is the key to the past”, it can be concluded that Merapi played an important role in the collapse of the Mataram Kingdom in the 7-10th century



Thank You for Listening