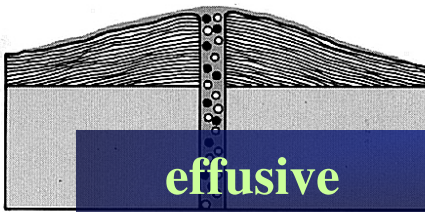
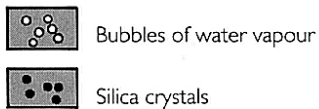


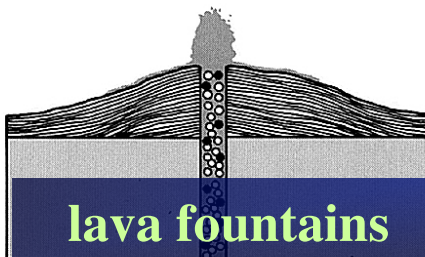
Style of Volcanism and the 3 Vs

- **V**iscosity
- amount of dissolved **V**olatiles
- **V**olume

**low viscosity
(shield)**



Low water/Low silica



High water/Low silica

less water
→ less vigorous

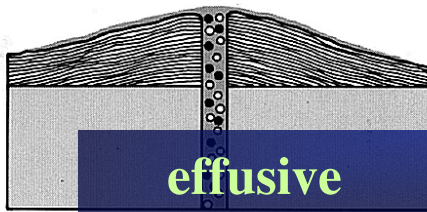
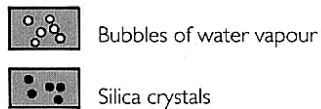
more water
→ more vigorous

Eruption Styles and Hazards

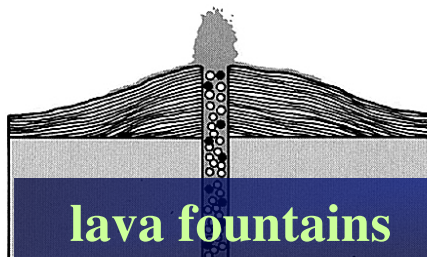
Style of Volcanism and the 3 Vs

**low viscosity
(shield)**

**high viscosity
(strato)**



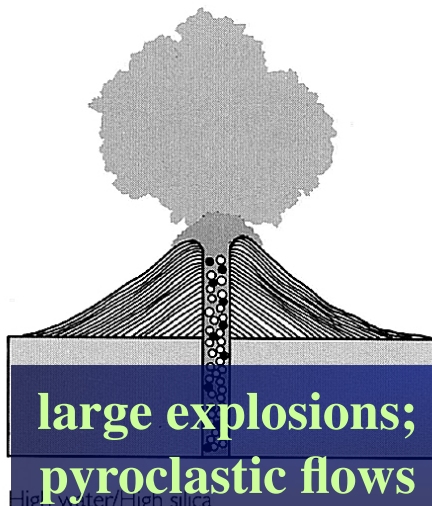
Low water/Low silica



High water/Low silica



Low water/High silica



High water/High silica

less water → less vigorous

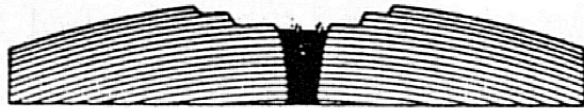
more water → more vigorous

Volcanic Eruption Types

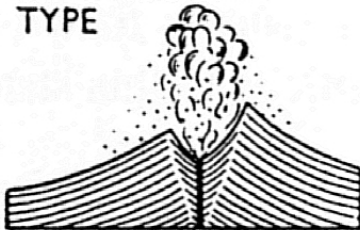
ICELANDIC TYPE



HAWAIIAN TYPE



STROMBOLIAN TYPE



VULCANIAN TYPE



- lava: large amounts; very low-viscosity
- non-explosive

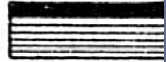
- lava: low-viscosity
- non-explosive

- lava: small amounts; medium-viscosity
- “peacefully explosive”
- cinder cones

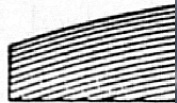
- lava: high-viscosity
- moderately violent

Volcanic Eruption Types

ICELANDIC
TYPE



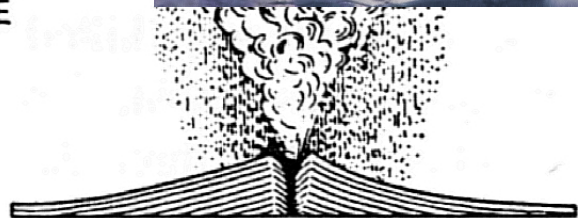
HAWAIIAN
TYPE



STROMBOLIAN
TYPE



VULCANIAN
TYPE



source: woodpress

lava: high-viscosity
■ moderately violent

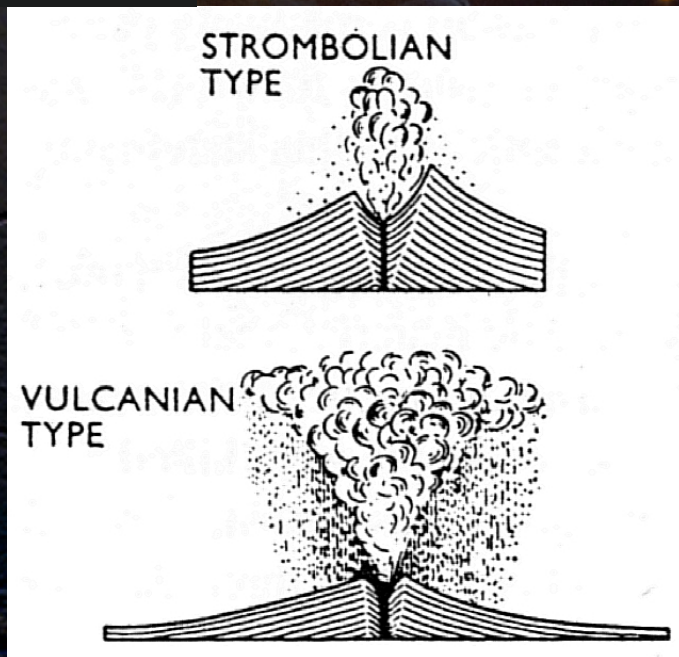




source: USGS



source: wikipedia

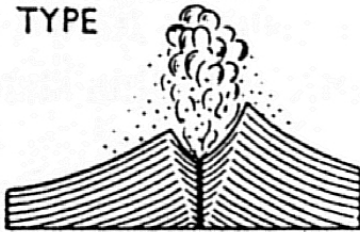


- lava: small amounts; medium-viscosity
 - “peacefully explosive”
 - cinder cones
-
- lava: high-viscosity
 - moderately violent



source: wikipedia

STROMBOLIAN
TYPE

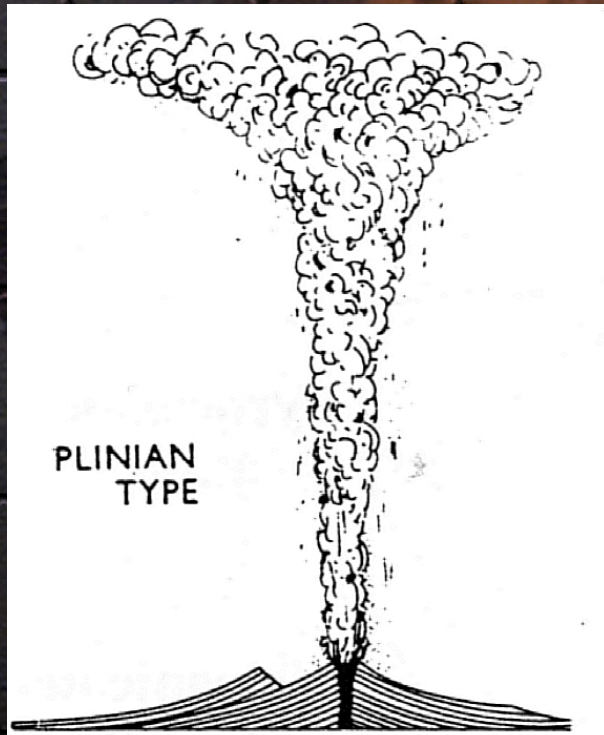


VULCANIAN
TYPE



- lava: small amounts; medium-viscosity
 - “peacefully explosive”
 - cinder cones
-
- lava: high-viscosity
 - moderately violent

Volcanic Eruption Types



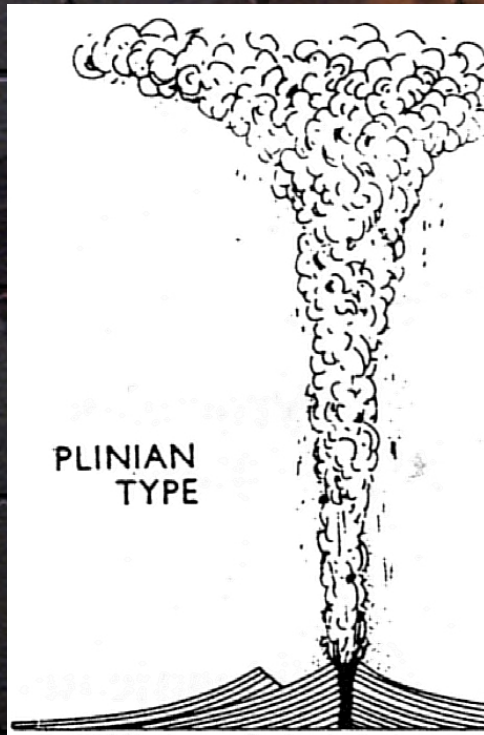
- lava: very high viscosity
- violent eruptions
- very high eruption column ($> 10\text{km}$)



Mt. Vesuvius,
Pompeii
79 A.D.



Vol



(10km)



VEI: Volcanic Explosivity Index

Volcanic Explosivity Index (VEI)

VEI	0	1	2	3	4	5	6	7	8
Volume (ejecta) [m ³]	<10 ⁴	10 ⁴ -10 ⁶	10 ⁶ -10 ⁷	10 ⁷ -10 ⁸	10 ⁸ -10 ⁹	10 ⁹ -10 ¹⁰	10 ¹⁰ -10 ¹¹	10 ¹¹ -10 ¹²	>10 ¹²
Eruption Column [km]	<0.1	0.1-1	1-5	3-15	10-25	> 25			
Eruption Style	Hawaiian		Vulcanian				Plinian		
		Strombolian							
Blast Duration [h]	< 1			1-6	6-12	> 12			

Kilauea, 1974

Nyiragongo, 2002

Stromboli, 2003

Nevado del Ruiz, 1985

Laki, 1783; Pelee, 1902;
Paricutin, 1943

Mt. St. Helens, 1980

Santorini, B.C. 1650;
Pinatubo, 1991

Tambora, 1815;
Crater Lake, B.C. 5000

Yellowstone, B.C. 650,000

- measure for volume, eruption column, duration