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## Caves In Cheju Island, Korea

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Cheju Island is a volcanic island formed at the end of the Tertiary period. Geological strata of the island include the Seoguipo Formation (end of the Cenozoic era), sedimentary rocks of the Seongsan, Whasoon, and Shinyangri Formations (Quaternary period), and basalt, trachyte, and other volcanic rock and debris. Most of the layers are basalt. Those layers in the Pioseonri, Mt. Hanla, Cheju, Hahyeri and Shiheungri areas are basic and of low viscosity, and are closely related to the distribution of lava tube caves. The lava caves of Cheju Island are in basalts with low viscosity and alkali. About 60 are known to have been investigated. About 100 are known.

Most of the caves of Cheju Island are located near villages and have been a part of the life of villagers. Some of them are separate parts of lava tube systems. In these systems, the caves at higher elevations tend to be larger than those at lower elevations. Two major groups of volcanic caves exist on the island: the Manjang cave area in the northeast, and the Socheon cave area in the Hanlim region.

The Manjang cave area includes Songdang Cave, Dockchon, Sagul Cave, Kaenaegi Cave, Pocknamoo Cave, Pocknamoo mit Cave, Boojong Cave, Waful Cave in Chocheon, Immemerru Cave, Gonaiesl Cave, Yooktigie Cave. The Socheon cave area includes Hyopjae Cave, Jorong Cave, Sanhyong Cave, Large Chokit Cave, and Hwankeum Cave.

The temperature of magma extruding from the ground here was about 900° to 1,200° Celsius. The surfaces soon cooled but the inner parts of the flows remained molten for long distances. When they evacuated themselves, lava tube caves remained. This occurred extensively on Cheju Island.

### Features of Cheju Island Caves

The volcanic caves of Cheju Island have scientific and other values because of their size, distribution, density, topography, and natural features. Some are among the longest in the world, and some of their natural features are exceptional. Among these features are the following:

#### **Lava rod or column**

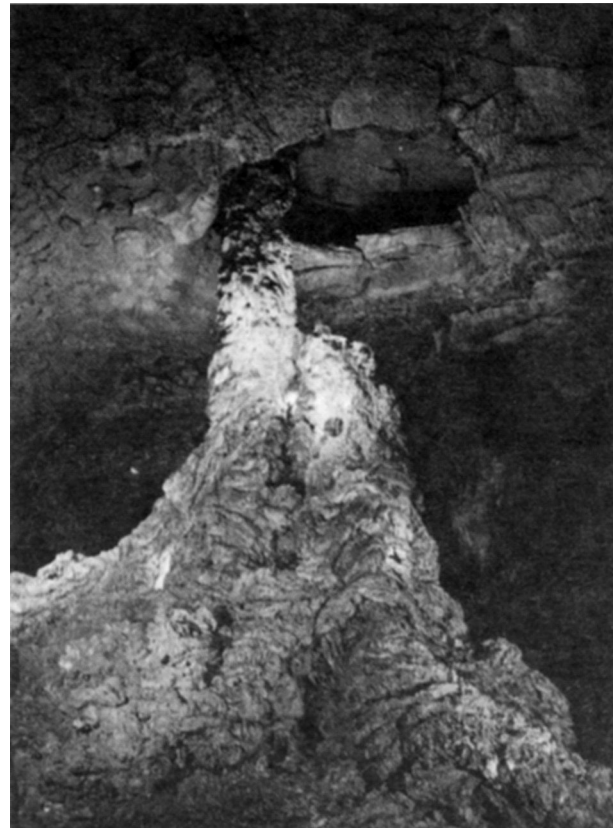
These features are formed by molten lava cascading into a cave passage which previously had cooled. The most notable is 1,000 meters upslope from the main entrance of Manjang Cave. It is 7.6 meters high and is the largest in the world.

#### **Lava ball**

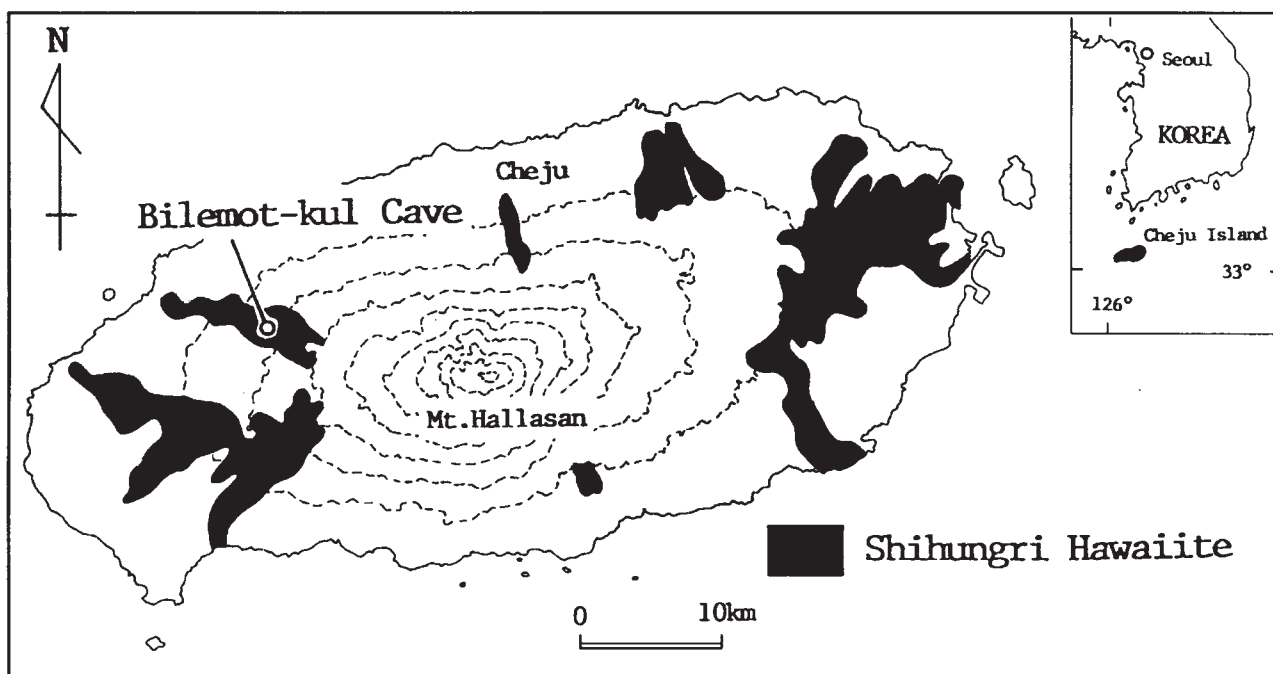
Lava balls are formed by solidification of aggregated lava in a stream of lava.

#### **Lava bridge**

Lava bridges are formed when the top of the lava flowing in a lava tube cave crusts and solidifies sufficiently to leave a floor of lava suspended from the walls.



*Figure 1 – A double lava column, 7.6 meters high, cascading from a small upper level passage into the main passage of Manjang Cave. The right hand section is hollow.*



#### Lava stalagmite

Lava stalagmites form from the piling-up of droplets of lava dripping onto a solid floor where they accumulate in a pile of solidified drops.

#### Lava stalactite

In some locations, hot lava solidifies when dripping from walls or ceiling like an icicle, forming lava stalactites.

#### Mini-Cave in Cave (Tube in Tube)

After formation of a lava tube cave, sometimes another lava stream flows along its bottom and produces a mini gaseous cave inside the original cave. This is called cave in cave or tube in tube.

#### Silica rod or column

Rarely, secondary silica stalactites develop in lava tube caves and extend to the bottom of the cave, forming rods. Those of Cheju Island are some of the most notable examples in the world.

#### Silication

Sometimes silicic acid in the liquid phase is deposited on the cave wall by gas. This is called silication.

#### Gas balls

Sometimes hollow droplets are attached to the wall or ceiling of a cave during lava flow.

Originally they contained concentrated gases and are called gas balls. Gas balls on the floor are formed by incomplete extrusion of gas in the lava flow.

#### Ropy lava

Sometimes the weight of low-density lava on cave walls presses it downward in a wavy form. This is called ropy lava.

#### Lava ledge

Lava ledges are formed by solidifying of the top outer edges of flowing lava in a lava tube cave.

### Meteorology of Cheju Island Caves

The temperature of Cheju Island caves is about 12° to 16° Celsius. The inner zones are almost at a constant temperature all year, although the entrance area temperatures differ considerably.

### Biota in Cheju Island Caves

The lava tube caves on Cheju Island are young. Thirty species of animals are known only from caves, with one troglobite (*Epanerchodus clavisetosus*). Fifty-one surface species have been identified in caves here. Only three species are aquatic.