Volcanoes are Our Friends, but Sometimes They Hurt Us

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Volcanoes produce many advantageous conditions for human endeavors and settlements. They are actually beneficial.

Agriculture: Volcanic ash is excellent soil for growing. Some of the world's best wines are from volcanic regions. Other crops grow well in ash, too.

Building materials: Volcanoes produce materials – such as pozzolona, ignimbrite, obsidian, pumice, and many others – that are *very* tough and useful, often stronger than standard stone.

Energy: Volcanoes crate the possibility of renewable, low-cost heat and power, as in the case of geothermal exploitation in Iceland.

Science: Volcanoes are, literally, windows into the earth, and they attract special attention and interest from researchers.

Beauty and prosperity: Volcanic landscapes are prized, attracting tourism and a host of special economic industries.

However, volcanoes *can* hurt us. Ash falls are very destructive, on many levels. Debris avalanches result as unstable lands collapse. Pyroclastic flows produce toxic gases and are fast moving. Lahars, or mudslides, result from "melted" earth.

Lava flows are slow, but inexorable and very destructive. Eruptions can be followed by flooding, tsunamis, and other byproduct effects.

Volcanoes harm humans directly, of course, and often over sustained periods of time. But buildings are especially vulnerable to damage.

Ash loads on roofs are a leading cause of structural failure and human injury. Ash becomes much heavier when it is wet, and it almost always gets wet.

Drain clogging and stoppages only exacerbate the problems of wet loading and damage.

Motor abrasion is inevitable as ash enters the air and the atmosphere, affecting all types of appliances and computers.

Ash removal is quite difficult, and at best takes a long period of time, with significant disruption.

The earth is full of volcanic activity, some of it quite recent. Today, as in times past, major human settlements are in close proximity to active volcanic sites. Here are just a few of them, with the dates in parentheses showing the latest active eruptions:

Vesuvius (Italy, 1944)
Kilauea (Hawaii, 1983)
Suribachi (Japan, 2001)
Merapi (Indonesia, 2007)
Popocatépetl (Mexico, 2010)
Galeras (Colombia, 2010)
Stromboli (Italy, 2010)
Etna (Italy, 2010)
Eyjafjallajökull (Iceland, 2014)
Ontake (Japan, 2014)
Sinabung (Sumatra, 2014)

All architects working in volcanic regions can do more to mitigate the effects of volcanic eruptions, by ensuring that structures are adequate to resist ash loads, and designing provisions for refuge.

Volcanoes hold an important place in human history, and may even figure as primordial elements in the human psyche. Architects and vernacular builders have of course been driven by the imperatives of volcanic building materials, and sometimes they have taken inspiration from volcanic forms themselves. This is a rich heritage that we hope will continue to be a source of inspiration.

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