

Fissure Encyclopedia Article

Fissure

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Fissure

Any extensive crack in the earth is a fissure. When a small or medium-size fissure is filled with **magma** it is termed a **dike**. A large, magma-filled fissure that breaches the surface may erupt along its whole length or manifest as a chain of craters, each connected by a short central pipe to the magma-filled fissure below.

Small fissures are a common feature of volcanoes built by central activity (i.e., fed by a single pipelike conduit at their core). Indeed, most central volcanoes begin as eruptions from fissures and later localize to a single, central vent. High pressure in the central pipe may cause cracks in the surrounding cone or shield; if such a fissure breaches the surface, it may become a secondary point of eruption or even take over for the central crater. A fissure of this type typically appears at the surface as a hairline crack that gradually increases in width. Sulfurous fumes and steam emerge first, followed by small, glowing crumbs of red-hot **rock**. Later, viscous **lava** begins to bulge and ooze from the fissure, followed by increasingly fluid and voluminous flow. Not all fissures open so gradually; where magma meets subsurface **water**, steam explosions can open or widen a fissure suddenly.

Small fissures around central volcanoes are a parasitic phenomenon. In contrast, eruptions along large, independent fissures are a distinct type of volcanism. Such eruptions may be pyroclastic (i.e., explosive eruptions of solid fragments), such as that which covered the Valley of Ten Thousand Smokes in Alaska with some 1.7 mi³ (7 km³) of ash and **pumice** in 1912, or those which covered Nevada and western Utah with 12,000 mi³ (50,000 km³) of welded **tuff** in the early Oligocene and late Pliocene Epochs. Fissure eruptions may also be gradual, such as the Great Tolbachik Fissure Eruption on the Kamchatka Peninsula in Russia, that in 1975 vented lava from a fissure 19 mi (30 km) long for 450 days and covered more than 15 mi² (40 km²) with lava flows.

Iceland is widening by about .5–1 in (1–2 cm) per year because it sits astride the Mid-Atlantic Ridge, and so is infiltrated by stretching-induced fissures that yield numerous fissure eruptions. Although not all independent fissure eruptions are on the largest scale, the most voluminous **volcanic eruptions** have all been fissure eruptions.

See Also

Crater, Volcanic; Pipe, Volcanic; Sea-Floor Spreading; Volcanic Eruptions; Volcanic Vent