

WHAT ARE THE FEATURES ASSOCIATED WITH THE DECAYING PHASES OF VOLCANISM?

Even after a volcano ceases to eject pyroclastic materials and lava, it may continue to emit steam, gases, mud etc. and these activities are expressed in form of fumaroles, hot springs, geysers, mud-volcanoes etc.

(a) Fumaroles

These are fissures or vents through which volcanic gases are ejected. The emission of gases, especially steam, occurs in all stages of volcanic activity, but it becomes the dominating and characteristic features of its declining stage.

A volcano discharging gases only is said to have attained the fumarolic stage. From the analysis of the materials accumulated by fumaroles, it has been established that the fumarolic gases belong to the groups of halides, sulphur, carbon, water-vapour, boric acid vapour, hydrogen etc.

The gas composition of fumaroles largely depends on their temperature and accordingly they have been classified as follows:

(i) Dry fumaroles

These are characterized by high temperature (around 500°C) and no steam. They are highly-saturated, with chlorous compounds of sodium, potassium and iron.

(ii) Acid fumaroles

These are also high temperature fumaroles, where the temperature is between 300 to 400°C. But they contain steam, hydrogen chloride and sulphur dioxide.

(iii) Alkaline fumaroles

These are within the temperature range of 200 to 300°C and contain mainly ammonium chloride.

(iv) Solfataras : are the fumaroles emitting sulphurous vapours and are characterized by the temperature of 100 to 200°C.

(v) Mofettes : are the fumaroles which mainly emit carbon- dioxide and steam and are with a temperature below 100°C.

(vi) Saffioni : are the fumaroles emitting boric-acid vapours.

The gaseous emanations from the fumaroles by the reaction with the country rocks sometimes bring about remarkable change in their mineralogical composition. The processes as a whole, are known as Pneumatolysis. The unique fumarolic field is the "Valley of Ten Thousand Smokes" near Katmai Volcano (Alaska).

(b) Hotsprings

These are also known as Thermas. These are avenues through which hot-water escapes to the surface. Hot- springs occur not only in volcanic regions but also in areas characterized by recent tectonic movements.

Hotsprings bring chemical substances to the surface. Calcareous deposits formed from hot-spring are known as Travertine or Tufa. Siliceous deposits produced by hot-springs are called Siliceous-sinters.

The water of the hotsprings usually gets heated with the increased temperature below, may be due to magmatic or radioactive-heat.

(c) Geysers

These are hot-springs ejecting boiling water and steam intermittently. In these cases, hot water and steam are explosively discharged. The waters of geysers contain a large amount of mineral matter, predominantly silica. At the time of eruption, the mineral matter fall out on the edges of the opening or vent, forming conical structures. Such mineral deposits are called geysersites.

(d) Mud-volcanoes

These are cone-shaped mounds, built up of mud, like miniature volcanoes. It is believed that hot water when passes through mud or volcanic ash in its ascent to the surface, it becomes muddy and form a conical mound with a crater at the top.

In certain cases the mud eruptions are quiet where the mud boils up and erupts in small spouts, whereas in other cases the eruption is explosive. The volcanic mud-flows are also known as Lahars. Mud-volcanoes occur in volcanic regions as well as in the areas of oil deposits(where the driving forces are gases produced due to decomposition of organic matter).

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