

## SECTION V.

## OPERATION OF IGNEOUS AGENCIES IN PRODUCING GEOLOGICAL CHANGES.

**VOLCANIC** action, in its widest sense, is the influence exerted by the heated interior of the earth upon its crust. Igneous agency has a still more extensive signification; embracing all the action exerted by heat upon the globe, whether the source be internal or external. The history of the former will prepare us better to appreciate the influence of the latter.

Volcanic agency has been at work from the earliest periods of the world's history; producing all the forms and phenomena of the unstratified rocks, from granite to the most recent lava. Modern volcanoes will first come under consideration.

These are of two kinds, *extinct* and *active*. The former have not been in operation within the historic period; the latter are constantly or intermittingly in action.

A *volcano* is an opening in the earth from whence matter has been ejected by heat, in the form of lava, scoria, or ashes. Usually the opening called the *crater* is an inverted cone; and around it there rises a mountain in the form of a cone, with its apex truncated, produced by the elevation of the earth's crust and the ejection of lava. The volcanic cones vary in height from 90 feet, as in the volcano of the Island of Reguain, near Sumatra, to 23,900 feet in Aconcagua, in Chile. The lower volcanoes are usually the most active.

When nothing but aqueous and corrosive vapors have been emitted from a volcanic elevation for centuries, such elevation is called a *solfatara*, or *fumerole*.

When volcanoes exist beneath the sea, they are called *submarine*; when upon the land, *subaërial*.

As a general fact, volcanic vents are arranged in extensive lines or zones; often reaching half around the globe.

**EXAMPLES.**—1. Perhaps the most remarkable line of vents is the long chain of islands commencing with Alaska on the coast of Russian America, which passes over the Aleutian Isles, Kamtschatka, the Kurilian, Japanese, Philippine and Moluccan Isles, and then turning, includes Sumbawa, Java and Sumatra, and terminates at Barren Island in the Bay of Bengal. 2. Another almost equally extensive line commences at the southern extremity of South