

of subterranean thunder were sometimes heard which resembled atmospheric thunder, but were inconceivably louder and more appalling: they were followed by earthquakes. Humboldt also mentions the frequency of subterranean thunder in some districts bordering the Andes.

In volcanic phenomena, we observe a cause in present activity, that can overthrow mountains, form new islands, and raise up the bed of the ocean: hence the geologist may infer, that the same cause, acting with greater intensity and more extensively, has been the agent employed by the Author of nature, to elevate new and submerge ancient continents, and to change and renovate the surface of the globe. We are indeed acquainted with no other natural agent that can have effected the mighty changes which the crust of our planet has undergone. The products of volcanoes, particularly of ancient ones, are analogous in their composition and internal structure to the oldest rocks of granite, sienite and porphyry, and indicate not obscurely, the mode in which these rocks were formed: hence the study of volcanoes and volcanic rocks, is an important branch of the science of geology. Werner and his disciples, however, held that volcanoes were produced merely by the ignition of beds of coal, in the secondary strata.

VOLCANOES are openings made in the earth's surface by internal fires; they, regularly, or at intervals, throw out smoke, vapour, flame, large stones, sand and melted stone called lava. Some volcanoes throw out torrents of mud and boiling water. Volcanoes, most frequently, exist in the vicinity of the sea or large lakes, and also break out from unfathomable depths below the surface of the ocean, and form new islands and reefs of rock. When a volcano breaks out in a new situation, it is preceded by violent earthquakes, the heated surface of the ground frequently swells and heaves up, until a fissure or rent is formed sometimes of vast extent. Through this opening masses of rock, with flame, smoke and lava, are thrown out, choke up part of the passage, and confine the eruption to one aperture or more, round which conical hills or mountains are formed. The concavity, in the centre, is called the crater. The indications of an approaching eruption from a dormant volcano, are an increase of smoke from the summit, which sometimes rises to a vast height, branching in the form of a pine tree. Tremendous explosions, like the firing of artillery, commence after the increase of smoke, and are succeeded by red coloured flames, and showers of stones. At length, the lava flows out, from the top of the crater, or breaks through the sides of the mountain, and covers the neighbouring plains with melted matter, which, becoming consolidated, forms a stony mass, often not less than some hundred square miles in extent, and several yards in thickness. The eruption of lava has been known to continue, several months. Intensely black clouds, composed of a kind of dark coloured sand or powder, improperly called ashes, are thrown out of the