

CHAPTER XVIII.

ON EARTHQUAKES AND VOLCANOES.

Phenomena that precede the Shock of an Earthquake.—Extent to which the Waters in Lakes and Springs are agitated during Earthquakes.—Extent to which Earthquakes are felt on Land.—More severe in Mountains than in level Countries.—Connection between Earthquakes and Volcanoes.—Electrical Earthquakes.—First Appearance of a Volcano.—Common Phenomena attending Volcanic Eruptions.—Remarkable Eruption of Sumbawa in 1815.—Long Periods of Repose in some Volcanoes.—Volcano of Popocateptl in Mexico.—Submarine Volcanoes; their Appearance preceded by violent Agitation of the Sea.—Submarine Volcanoes in the Azores—in the Grecian Archipelago.—Recent Submarine Volcano near Sicily.—Craters of Eruption.—Craters of Elevation.—Theory of Von Buch confirmed by analogous Geological Facts.—Eruptions of Mud and Water from Volcanoes.—Groups of Volcanic Islands.—Fall and Extinction of a Volcano.—Vast Extent of some ancient Volcanoes.—Extinct Volcanoes of Central France.—Puy de Pariou, the best preserved of ancient Volcanoes.—Extinct Volcanoes in Germany and Asia.—Pseudo-Volcanoes.—Volcanic Rocks and Products.—Observations on Volcanic Fire.

ACCUSTOMED to view the hills in our own country in a state of profound repose, presenting in each succeeding year, the same unvaried outline, we can scarcely conceive the possibility of a whole district being covered, in the space of a single night, with new mountains and another soil; yet, within the limits of authentic history, such changes have been produced, by the united agency of earthquakes and volcanoes. For a particular description of recent volcanic eruptions, and the changes they have produced on the surrounding countries, I must refer the reader to the works of Spallanzani, Dolomieu, Sir William Hamilton, and M. Humboldt, and to the recent account of the Island of Java, by Lieutenant-Governor Raffles.

In the present chapter I propose, 1st, to describe those phenomena that indicate the connection between earthquakes and volcanoes, and between the volcanoes in distant countries; 2dly, to take a view of the most remarkable recent volcanic eruptions, and of the remains of ancient volcanoes, that prove the extensive action of internal heat on the crust of the globe; and, 3dly, to give a concise account of volcanic rocks and products.

Earthquakes and volcanoes may be considered as different effects, produced by the agency of subterranean fire. They frequently accompany each other; and, in all instances, that have been observed, the first eruption of a volcano is preceded by an earthquake of greater or less extent. Volcanoes do not make their appearance in every country where the shock of an earthquake is felt: but earthquakes are more frequent in volcanic districts than in any other. Earthquakes are, almost always, preceded by an uncommon agitation of the waters of the ocean, and of lakes. Springs send forth torrents