

with those muddy eruptions, which cover large tracts of country with strata containing bituminous or inflammable matter : these strata are as essentially volcanic products, as the matter thrown out of the volcano of Macaluba in Sicily, which never ejects lava ; and we are hence instructed, that one of the substances which promotes volcanic combustion, is bitumen or carbon. The muddy eruptions in the Andes, when first ejected, have little consistence or tenacity ; but they soon become hard, and form what is called by the inhabitants *moya* ; it is dark coloured and soils the fingers, and is used instead of turf for fuel.

Boiling springs, and thermal waters, must be classed with volcanic phenomena ; for it can scarcely be doubted, that the Geysers in Iceland, which, at intervals, throw up columns of boiling water to the height of seventy or eighty feet, are occasioned by the subterranean fires which extend under that island. To the same cause must be ascribed the boiling fountains in the island of St. Michael, one of the Azores. The hot springs in the vicinity of the Pyrenees, in Italy, and in other parts of the world, may with much probability be supposed to have a similar source of heat. The unvaried equality of their temperatures for centuries, proves that this source lies far below the agency of those causes which operate on the surface. It has been remarked, that hot springs are most frequent in volcanic and basaltic countries. Though no active volcano exists in the Pyrenees, M. Dralet, in his *Description des Pyrénées*, says, “ that the hot springs and frequent earthquakes in different parts of this chain, offer proofs of the present operation of subterranean fires.” I have described the thermal waters of the Alps in the second volume of my “ Travels in the Tarentaise,” and in Chap. V. p. 68. of the present work.

However powerful the effects of subterranean fire may be in various parts of the globe, we must conclude, from the remains of ancient volcanoes, that in a former period, the action of volcanic fire was far more extensive and intense than at present.

According to Breislak, an Italian geologist, in a space of twenty miles in length and ten in breadth, between Naples and Cumæa, there are no less than sixty craters ; some of them are larger than that of Vesuvius. One of them is two miles in diameter. The city of Cumæa, founded twelve hundred years before the Christian era, is built in the crater of an ancient volcano.

In other parts of Italy, there are undoubted vestiges of ancient volcanoes. In Sicily, there are a number of extinct volcanoes, beside those connected with Ætna. Many islands in the Grecian Archipelago are volcanic. There are remains of large volcanic craters in Spain and Portugal ; and the extinct volcanic mountains in the middle and southern parts of France, cover several thousand square miles. On the eastern banks of the Rhine, and the environs of Andernach, there are numerous extinct volcanoes,