elevation to subterranean fire: for, we have a recent instance of the mighty power of this agent to upheave the crust of the globe. During the earthquake in Chili, in November 1822, the whole line of coast, running north and south from Valparaiso, to the distance of one hundred miles, was raised above its former level, the bottom of the sea was laid dry, and shells were discovered sticking to the rocks, some of which were not before known in those seas. It is stated by an observer, that the whole country, from the coast to the feet of the Andes, and even far out to sea, was permanently raised by the earthquake: the greatest rise was about two miles from the shore. granite which forms the foundation rock was rent in parallel fissures. The earthquake is estimated to have extended over an area of one hundred thousand miles. The average rise of the land upon the coast was from two to five feet; at the distance of a mile from the shore inland the elevation was seven feet.

During my residence in Savoy and Switzerland in the years 1820, 1821, and 1822, I was desirous to ascertain whether there were any vestiges of the action of the subterranean fires in the Alps. In the part of the great southern chain, extending from near the source of the Rhone to the Little St. Bernard, there do not occur, in the numerous situations which I examined, or, from which I have seen specimens, any minerals of a volcanic character, with the doubtful exception of some rocks in the valley of Saass and in the Valorsine.

Though I could observe no indications of volcanic fire in the rocks themselves, I was greatly surprised with a circumstance that, as far as I know, had escaped the attention of geologists. Along the whole line of Alps before mentioned, which extends for one hundred and twenty miles, numerous hot springs are gushing out at the feet of the primary mountains, near the junction of the lowest secondary limestone with schistose rocks passing into mica and talcous slate. It was known, that a few thermal waters existed in the Valois and in Savoy, but they were regarded as isolated phænomena, and their geological position had not been attended to. Since Saussure visited the Alps, thermal waters have been discovered in various situations; and since I left Savoy, another considerable warm spring has been opened in the vicinity of the village of Chamouni, near the foot of a glacier.

There is, also, further reason to believe, that thermal waters would be found in all the deep valleys of the Alps, near the junction of the primary and secondary rocks, were they not covered by *éboulements* under heaps of loose stones (as was the case with the warm baths in the valley of Bagnes in the Bas Valois;) or were not the temperature of the warm springs reduced, by admixture with torrents from the glaciers.

In vol. i. ch. 8. of my "Travels in Savoy," I have described the geological position of nine of the principal known thermal waters of the Alps; their temperature varies from 94° to 126° Fahrenheit.