

ginning of April, "that the southern extremity of the island had been raised eight feet, the middle nine, and the northern end upwards of ten feet. On steep rocks, where vertical measures could be correctly taken, beds of dead mussels were found ten feet above high-water mark. One foot lower than the highest bed of mussels, a few limpets and chitons were seen adhering to the rock where they had grown. Two feet lower than the same, dead mussels, chitons, and limpets were abundant.

"An extensive rocky flat lies around the northern parts of Santa Maria. Before the earthquake this flat was covered by the sea, some projecting rocks only showing themselves. Now, the whole flat is exposed, and square acres of it are covered with dead shell-fish, the stench arising from which is abominable. By this elevation of the land the southern port of Santa Maria has been almost destroyed; little shelter remaining there, and very bad landing." The surrounding sea is also stated to have become shallower in exactly the same proportion as the land had risen; the soundings having diminished a fathom and a half everywhere around the island.

At Tubal, also, to the south-east of Santa Maria, the land was raised six feet, at Mocha two feet, but no elevation could be ascertained at Valdivia.

Among other effects of the catastrophe, it is stated that cattle standing on a steep slope, near the shore, were rolled down into the sea, and many others were washed off by the great wave from low land and drowned.*

In November of the same year (1835), Concepcion was shaken by a severe earthquake, and on the same day Osorno, at the distance of 400 miles, renewed its activity. These facts prove not only the connection of earthquakes with volcanic eruptions in this region, but also the vast extent of the subterranean areas, over which the disturbing cause acts simultaneously.

Ischia, 1828.—On the 2nd of February the whole island of Ischia was shaken by an earthquake, and in the October following I found all the houses in Casamicciol still without their roofs. On the sides of a ravine between that town and Forio, I saw masses of greenish tuff, which had been thrown down. The hot-spring of Rita, which was nearest the centre of the movement, was ascertained by M. Covelli to have increased in temperature, showing, as he observes, that the explosion took place below the reservoirs which heat the thermal waters.†

Bogota, 1827.—On the 16th of November, 1827, the plain of Bogota, in New Granada, or Colombia, was convulsed by an earthquake, and a great number of towns were thrown down. Torrents of rain swelled the Magdalena, sweeping along vast quantities of mud and other substances, which emitted a sulphurous vapour and destroyed the fish. Popayan, which is distant two hundred geographical miles

* Darwin's Journ. of Travels in South America, in Voyage of H. M. ship Beagle, p. 372.

† Biblioth. Univ. Oct. 1828, p. 157.; and Férussac, Bulletin, &c., tom. xi. p. 227.