

S.S.W. of Bogota, suffered greatly. Wide crevices appeared in the road of Guanacas, leaving no doubt that the whole of the Cordilleras sustained a powerful shock. Other fissures opened near Costa, in the plains of Bogota, into which the river Tunza immediately began to flow.* It is worthy of remark, that in all such cases the ancient gravel bed of a river is deserted, and a new one formed at a lower level; so that a want of relation in the position of alluvial beds to the existing water-courses may be no test of the high antiquity of such deposits, at least in countries habitually convulsed by earthquakes. Extraordinary rains accompanied the shocks before mentioned; and two volcanos are said to have been in eruption in the mountain-chain nearest to Bogota.

Chili, 1822. — On the 19th of November, 1822, the Coast of Chili was visited by a most destructive earthquake. The shock was felt simultaneously throughout a space of 1200 miles from north to south. St. Jago, Valparaiso, and some other places, were greatly injured. When the district round Valparaiso was examined on the morning after the shock, it was found that the coast, for a considerable distance, was raised above its former level.† At Valparaiso the elevation was three feet, and at Quintero about four feet. Part of the bed of the sea, says Mrs. Graham, remained bare and dry at high water, “with beds of oysters, mussels, and other shells adhering to the rocks on which they grew, the fish being all dead, and exhaling most offensive effluvia.”‡

An old wreck of a ship, which before could not be approached, became accessible from the land, although its distance from the original sea-shore had not altered.§ It was observed that the water-course of a mill, at the distance of about a mile from the sea, gained a fall of fourteen inches, in little more than one hundred yards; and from this fact it is inferred that the rise in some parts of the inland country was far more considerable than on the borders of the ocean.|| Part of the coast thus elevated consisted of granite, in which parallel fissures were caused, some of which were traced for a mile and a half inland. Cones of earth about four feet high were thrown up in several districts, by the forcing up of water mixed with sand through funnel-shaped hollows, — a phenomenon very common in Calabria, and the explanation of which will hereafter be considered. Those houses in Chili of which the foundations were on rock were less damaged than such as were built on alluvial soil.

Mr. Cruickshanks, an English botanist, who resided in the country during the earthquake, has informed me that some rocks of greenstone at Quintero, a few hundred yards from the beach, which had always been under water till the shock of 1822, have since been uncovered when the tide is at half-ebb; and he states that, after the earthquake, it was the general belief of the fishermen and inhabitants of the

* Phil. Mag., July, 1828, p. 37.

† See Geol. Trans., vol. i., second series; and also Journ. of Sci. 1824, vol. xvii. p. 40.

‡ Geol. Trans., vol. i., second series, p. 415.

§ Ibid.

|| Journ. of Sci., vol. xvii. p. 42.