

state, in regard to the numerous vents of Chili, that the volcanos of Yantales and Osorno were in eruption during the great earthquake of 1835, at the same moment that the land was shaken in Chiloe, and in some parts of the Chilian coast permanently upheaved; whilst at Juan Fernandez, at the distance of no less than 720 geographical miles from Yantales, an eruption took place beneath the sea. Some of the volcanos of Chili are of great height, as that of Antuco, in lat. $37^{\circ} 40' S.$, the summit of which is at least 16,000 feet above the sea. From the flanks of this volcano, at a great height, immense currents of lava have issued, one of which flowed in the year 1828. This event is said to be an exception in the general rule; few volcanos in the Andes, and none of those in Quito, having been seen in modern times to pour out lava, but having merely ejected vapour or scorix.

Both the basaltic (or augitic) lavas, and those of the felspathic class, occur in Chili and other parts of the Andes; but the volcanic rocks of the felspathic family are said by Von Buch to be generally not trachyte, but a rock which has been called andesite, or a mixture of augite and albite. The last-mentioned mineral contains soda instead of the potash found in common felspar.

The volcano of Rancagua, lat. $34^{\circ} 15' S.$, is said to be always throwing out ashes and vapours like Stromboli, a proof of the permanently heated state of certain parts of the interior of the earth below. A year rarely passes in Chili without some slight shocks of earthquakes, and in certain districts not a month. Those shocks which come from the side of the ocean are the most violent, and the same is said to be the case in Peru. The town of Copiapo was laid waste by this terrible scourge in the years 1773, 1796, and 1819, or in both cases after regular intervals of twenty-three years. There have, however, been other shocks in that country in the periods intervening between the dates above mentioned, although probably all less severe, at least on the exact site of Copiapo. The evidence against a regular recurrence of volcanic convulsions at stated periods is so strong as a general fact, that we must be on our guard against attaching too much importance to a few striking but probably accidental coincidences. Among these last might be adduced the case of Lima, violently shaken by an earthquake on the 17th of June, 1578, and again on the very same day, 1678; or the eruptions of Coseguina in the year 1709 and 1809, which are the only two recorded of that volcano previous to that of 1835.*

Of the permanent upheaval of land after earthquakes in Chili, I shall have occasion to speak in the next chapter, when it will also be seen that great shocks often coincide with eruptions, either submarine, or from the cones of the Andes, showing the identity of the force which elevates continents with that which causes volcanic outbursts.†

The space between Chili and Peru, in which no volcanic action has been observed, is 160 nautical leagues from south to north. It

* Darwin, Geol. Trans. 2d series, vol. v. p. 612.

† Ibid. p. 606.