

sea-shore flung down before the oscillations had reached their own habitations, which fell into ruins a few moments after.

The earthquakes of Chili (July 1794), which ravaged 300 leagues of the American coast, were felt 170 leagues out at sea, so that the convulsion spread over a superficial area of upwards of 50,000 square leagues.

On the 8th of September 1601, men felt at Lima a shock of earthquake which extended over nearly the whole of Europe, and even into Asia.

The convulsion which overwhelmed Caracas, the 12th of May 1812, propagated itself to a distance of 180 leagues.

The earthquake in New Granada, on the 17th of June 1826, exercised its fatal influence over an area of many square miles.

Earthquake shocks in Martinico are felt over the West Indies, in Florida, along the Gulf of Mexico, and over a portion of South America ; in other words, over an area of 375,000 square leagues.

[It happens at times that the *length* of the area convulsed greatly exceeds the breadth, as if the undulations were confined within a comparatively narrow channel. Thus, in the Chilian earthquake of 1835 the extent of ground affected was as 2 to 1 in length compared with breadth ; and in the Syrian earthquake of 1837, as 5 or 6 to 1.

The terrible earthquake which devastated Peru and Ecuador on the 13th of August 1868, extended along the coast of the Pacific for 1200 miles—from 8° S. to 42° S. lat.—and was felt at numerous remote points in the West Indies and Mexico.]

The comparison of these and other similar occurrences fully establishes the fact of the propagation of the earth-wave over very considerable spaces. The oscillation seems spread at times over a great circle more or less inclined towards the equator.

It is unnecessary to say that these terrible manifestations of the hidden forces of Nature are not confined to continents. The bottom of the ocean may be shaken by the commotion of the earth, and a violent movement in this manner communicated to the great mass of waters. Out at sea vessels have frequently experienced shocks of this description. In 1660 Captain Oxmann was navigating the Southern Ocean, when suddenly his ship experienced a rocking which occasioned the crew a paroxysm of terror. They thought she had run aground, but, after casting anchor, quickly discovered that they were far distant from reef or sandbank. A similar accident befel the navigator Lemaire in the strait which bears his name.

The violence of these earthquakes has frequently dismasted "tall barques," and caused them to spring dangerous leaks ; but the equilibrium natural to a ship renders this species of accident of no very serious character. The tumult of waters produced by earthquakes is only formidable upon the shore, where it is not unfrequently the cause of melancholy catastrophes.

During the disaster of Lisbon the upheaval of the ocean added its ravages to those of falling houses and shattered churches. The waves rose to a height of fifty feet above the highest tides. This mountain of seething, and boiling, and foaming water broke with resistless fury on the ruined city, overwhelming whatever the earthquake had spared, and inundating the whole line of coast. Thrice did the pitiless sea return to the assault, dragging back with it in its hasty retrocession everything that it had encountered in its furious march.