

of the mud at the bottom of the sea containing organic matter in decay. In the Bay of Callao, during a calm day, I noticed that as the ship dragged her cable over the bottom its course was marked by a line of bubbles. The lower orders in Talcahuano thought that the earthquake was caused by some old Indian women, who two years ago being offended stopped the volcano of Antuco. This silly belief is curious, because it shows that experience has taught them to observe that there exists a relation between the suppressed action of the volcanoes and the trembling of the ground. It was necessary to apply the witchcraft to the point where their perception of cause and effect failed; and this was the closing of the volcanic vent. This belief is the more singular in this particular instance, because, according to Captain Fitz Roy, there is reason to believe that Antuco was nowise affected.

The town of Concepcion was built in the usual Spanish fashion, with all the streets running at right angles to each other; one set ranging S.W. by W., and the other set N.W. by N. The walls in the former direction certainly stood better than those in the latter: the greater number of the masses of brickwork were thrown down toward the N.E. Both these circumstances perfectly agree with the general idea of the undulations having come from the S.W.; in which quarter subterranean noises were also heard: for it is evident that the walls, running S.W. and N.E., which presented their ends to the point whence the undulations came, would be much less likely to fall than those walls which, running N.W. and S.E., must in their whole lengths have been at the same instant thrown out of the perpendicular; for the undulations, coming from the S.W., must have extended in N.W. and S.E. waves, as they passed under the foundations. This may be illustrated by placing books edgewise on a carpet, and then, after the manner suggested by Michell, imitating the undulations of an earthquake: it will be found that they fall with more or less readiness, according as their direction more or less nearly coincides with the line of the waves. The fissures in the ground generally,