

specific examples the frequency of earthquakes along narrow tracts or over areas which have been the seat of important crust-movements of displacement, fracture, or subsidence. Toula proposed the distinctive name of "dislocation earthquakes" to such as accompanied the grander movements in the earth's crust.

Gilbert in California, Griesbach in Beloochistan, Koto in Japan, and other observers have proved the origin of extensive fissures at the earth's surface as a consequence of recent earthquakes. Permanent changes in the surface conformation, especially subsidences, have very often been reported as a chief factor in the catastrophes caused by earthquakes. In the fearful earthquake at Lisbon, the quay sank into the sea with all the ships anchored in it and thousands of people on its margin. During the Calabrian earthquake, in the year 1783, more than two hundred lakes and morasses were formed. In the year 1819, according to Lyell, an earthquake at the eastern river-mouth of the Indus converted an area 2000 square miles in extent into a lake; on the Mississippi flats, in China, Syria, and Chili, earthquake inthrows have been recorded.

It has, however, rarely happened that the ground has been elevated in consequence of the passage of an earthquake. The best known accounts of elevations come from Chili, and were accepted as trustworthy by no less an authority than Charles Darwin; Professor Suess regards them as of doubtful integrity, and C. W. Fuchs affirms that since earthquakes and their phenomena and consequences have been observed with scientific accuracy, not a single case of ground-elevation has been authoritatively recorded.

*G. Secular Movements of Upheaval and Depression.*—The study of the sedimentary deposits of past geological epochs reveals conclusively that vast changes have repeatedly taken place in the distribution of land and sea upon the face of the earth. But it is difficult to determine what changes are now in progress, whether certain parts of the earth's land surfaces are being at present elevated or depressed, or whether oceanic variations are accomplishing changes in the relative level of land and sea. It seems almost impossible to record slow movements in the interior of the continents, and the topographical maps render little assistance in this respect, as