

Section iii. Secular Upheaval and Depression

Besides scarcely perceptible tremors and more or less violent movements due to earthquake-shocks, the crust of the earth is generally believed to undergo in many places oscillations of an extremely quiet and uniform character, sometimes in an upward, sometimes in a downward direction. So tranquil may these changes be, as to produce from day to day no appreciable alteration in the aspect of the ground affected, so that only after the lapse of several generations, and by means of careful measurements, can they really be proved. Indeed, in the interior of a country nothing but a series of accurate levellings from some unmoved datum-line might detect the change of level, unless the effects of the terrestrial disturbance showed themselves in altering the drainage. Only along the sea-coast is a ready measure afforded of any such movement.

It is customary in popular language to speak of the sea rising or falling relatively to the land. We cannot conceive of any possible augmentation of the oceanic waters, nor of any diminution, save what may be due to the extremely slow processes of abstraction by the hydration of minerals and absorption into the earth's interior. Any changes, therefore, in the relative levels of sea and land must be due to some readjustment in the form either of the solid globe or of its watery envelope or of both. Playfair argued at the beginning of this century that no subsidence of the sea-level could be local, but must extend over the globe.¹⁹⁴ But it is now recognized that what is called the sea-level cannot pos-

¹⁹⁴ "Illustrations of the Huttonian Theory," 1802. The same conclusion was announced by L. von Buch, "Reise durch Norwegen und Lapland," 1810.