

negative movements, Professor Suess thinks it impossible to explain them by local ground-elevations; they must be assigned to physical causes of universal significance.

In addition to the general movements of the water-surface, there have been oscillatory fluctuations of level limited to smaller districts. Local sinking of level is probably due to submarine eruptions or any increase of the deposits on the sea-floor; or it may be connected with continental denudation and the smaller attractive power exerted on the water by adjoining land. Ascending movements have their origin probably in periodic and alternate heaping of the ocean-water at the Poles or at the Equator, or in local expansion of the water surface under the attraction of newly-formed land or ice masses.

The tangential folding of the earth's crust, to which Suess attributes the origin of mountain-systems, exerts, in his opinion, only a small and indirect influence on the sea-level. The uprise of continents takes place only as a result of crust-inthrows and consequent depression of the sea-level. In the upraised land, as the gradients of rivers become greater, the transportation of sediment is likewise increased; enormous masses of material gather close to the coast, and the weight of these depresses the sea-floor, inducing further positive movement. All the reported facts which might seem to countenance the conception of upheaval of the land are subjected by Professor Suess to careful criticism, and found by him to be for the most part untrustworthy as direct evidence of land movements. In so far as Suess has referred the grander secular movements to subsidence of the water-level associated with crust shrinkage, his results will commend themselves to all students of crust-physics. But his work cannot be said to have arrived at a solution of the causes of local oscillatory movements. Suess himself concludes his discussions with the somewhat mystic-sounding sentence:—"As Rama looks across the ocean of the universe, and sees its surface blend in the distant horizon with the dipping sky, and as he considers if indeed a path might be built far out into the almost immeasurable space, so we gaze over the ocean of the ages, but no sign of a shore shows itself to our view" (*Das Antlitz der Erde*, ii. 703).

Notwithstanding the strong arguments directed by Suess against secular upheaval of land areas, many geologists believe in an independent upward movement of certain parts of the