

Croll and J. H. Schmick. These observers also supposed that periodic attraction of the ocean-water now towards one hemisphere, now towards the other, caused variations of climate and fluctuations of level. But if this hypothesis be correct, there ought to be extensive regions of depression or elevation; local movements in opposite senses, and especially oscillatory movements, are excluded. Dana's assumption of a widely-extended movement of elevation towards the North Pole has been supported by Sir Henry Howorth, whose idea is that the land is rising at both the Poles and contracting at the Equator.

From the actual distribution of the geological formations, Dr. Trautschold inferred the probable conditions of the earth's surface during past epochs, and argued that the volume of water in the ocean has gradually been diminishing. As immediate causes of diminution, he specified the accumulation of masses of snow and ice on land areas, the formation of inland seas and rivers, the absorption of water in consequence of the hydration of rock-forming minerals, and the consumption of water in the organic world. Dr. Trautschold by no means contested movements of crust-elevation, but thought many cases of so-called secular upheaval explicable by the lowering of the ocean-level.

Professor Eduard Suess introduced quite new ideas into the discussion of secular movements. In 1875, in his work on the origin of the Alps, he attributed the elevation of the Scandinavian Peninsula to the upward arching of a wide fold; but in later works, when he entered into a full and critical treatment of the whole question, he came to the conclusion that there were no movements of the crust in vertical senses, with the exception of those which are accomplished indirectly in the course of crust-folding. Suess then proposed a neutral terminology to express changes of level; instead of "elevation" and "subsidence" he now speaks of "positive" movements when a coast-line *appears* to rise, and "negative" movements when it *appears* to sink. His first elucidation of these views in 1880 culminated in the statement that the phenomena of so-called secular upheaval and depression had their origin in continuous changes in the liquid envelope of our globe. Suess could offer no explanation of those changes, which sometimes at one period might amass the ocean-water towards the equatorial zones, at another withdraw it towards Polar regions. He indicated as a possibility that they might have some connection