2. *Changes in the position of the earth's axis.* — If a change should take place in the position of the earth's axis, through changes of level in the earth's crust, the coast-lines of the earth would be throughout affected by the new adjustment of the water level. Physicists have very nearly relieved geology of this source of doubt, by the decision that an effective change of this kind is exceedingly improbable (page 255).

3. *A change in the level of the land.* — By the law of gravitation, elevated lands attract, and thus draw the mobile waters of the ocean toward them to a height dependent on their mass and distance. Consequently the sea-margin of all coasts is more or less displaced, and much so, wherever the land mass adjoining rises high above it. It has been calculated that from this cause the sea level at the center of the Eurasian continental mass is about 2900 feet above the sea at its margin (R. S. Woodward); at the center of the Australian mass, about 400 feet (G. G. Stokes, 1849, 1887); of the great plateau of India, 1000 feet, but under the volcanic mountain of Maui, Haleakala, 10° in mean slope, only 10 feet.

The facts make it evident that the water-line along nearly all coasts, and especially on the west coast of North and South America, must be very largely moved inland by the mountain chains; and that, through geological time, changing levels have always been changing the water-lines. It is to be observed, furthermore, that this inland drawing of the ocean's water *diminishes* the height of the mountains above the sea. *The error is on the side of too little height.*

The piling of ice over the land in a glacier epoch has a like effect, but with material having about two fifths the gravity of the ordinary land material. Were the ice of a glacial epoch to be accumulated about the poles, and thus make a polar ice-cap or meniscus thousands of feet high, the ocean level would be changed through all latitudes to the equator. This cause has been thought sufficient to explain *apparent* subsidences in the hemisphere so capped.

But since the change of water level from the equator to the pole would follow a geometric ratio, admitting of mathematical calculation, the accordance of the theory with actual facts is easily tested. In eastern America the subsidences closing the Glacial period supposed to be thus accounted for by Croll have no correspondence with the required heights. Moreover, observations have proved that there was no such polar ice-cap in the Glacial period.

4. *Abstraction of water from the ocean.* — Further, the making of great continental accumulations of ice would lower the level of the ocean and tend to raise the *apparent* level of the land.

With the above cautionary considerations in view, noting that the observations about ice relate only to glaciated regions, that the error from the attraction of the land is on the side of too little height, and that sea-bottom changes of level affect all coast-lines alike, the following facts may be accepted as proof of changing levels over the earth's surface.