

circle, it could do this only by falling down in some places and rising in others; as is represented by the irregular line between the two circles. Thus would the surface of the earth become plicated by the sinking down of some parts by their gravity, and the elevation of correspondent ridges by the lateral pressure.

It has been objected that such a shortening of the earth's diameter as this hypothesis supposes would increase the rapidity of its rotary motion, and shorten the length of the day; whereas astronomy shows that for 2,000 years no such change has taken place.

But that period is too short fairly to test the point; since it requires a long time for the tension upon the crust of the globe to become so great as to produce a fracture; and this may not have occurred since that time. If there be any flexibility, however, in the earth's crust, gravity must produce some depression of it in some places, and elevation in others, before the tension is great enough to produce a fracture. And possibly this may be the origin of some cases of slight subsidence or elevation on record.

Thus a contraction of the nucleus beneath the crust causes a subsidence of the surface in one place and an elevation in another, by lateral pressure. This leads us to speak more particularly of the *depression of the beds of the oceans*, and the *vertical movements of continents*.

DEPRESSION OF THE BEDS OF OCEANS.

The subsidence of the surface would be greatest where the crust was thinnest, and least where the crust was thickest. When the crust was sufficiently cool to allow the presence of water, large lakes would collect in the lowest places, where the subsidence had been the greatest. The parts elevated would continue to increase in thickness more than the depressed portions, because the heat would radiate less rapidly through the former. We must suppose that this process of the subsidence of the basins and the elevation of the shores to have continued until oceans and continents were formed. Some maintain, as Professor Dana, whose excellent views we mostly adopt upon the whole subject of refrigeration, that our present oceans and continents have never changed places from the earliest times, but that the oceans have been constantly growing deeper, and the continents higher, though subject to frequent minor variations.

These principles may be more clearly understood by an explanation of Fig. 126. The dotted line *a a* represents the outline of the globe before contraction; the line *c c*, its present surface, having a large ocean, *d d*, in a depression of the surface. At first there may have been numerous small depressions in the district now occupied by the ocean, too shallow to contain all the water. As the depth increased the water would leave the higher lands and occupy the oceanic depression, while the continental shores *e e* are enlarging and rising. The depression may not be uniform, but may be studded with islands, *f f*, often