tion, and adds that the denudation could not have produced any result until the elevation had made some progress. The theory supposes the isostatic condition of the globe; and if this was the condition in Cretaceous time before the elevation began, the elevation never could have taken place without force from some real source.

In accordance with the above, the evaporation of the flooded Great Salt Lake (called Lake Bonneville), which, in the middle of the Quaternary era, had reached a depth of 1000 feet, has been suggested by G. K. Gilbert as the cause of the inequality of height in different parts of the terrace that marks its old coast-line. The change of level indicated is stated to be about 200 feet. The pressure of 1000 feet of water, or that removed by evaporation, is equivalent to 450 pounds to the square inch. The theory implies a molecular transfer (as the waters disappeared in the Middle Quaternary) from the outside region to that beneath the lake. The explanation is put forward by Gilbert with the statement that further investigation is required before the view can be regarded as established.

The difficulty with the Gravitation Theory in its best form is that it does not supply the amount of pressure, and of contraction or expansion, which is required by the facts.

This is true of Reade's theory, even with the recurrent work of igneous intrusions. In the case of the Appalachians the width of the geosyncline from S.E. to N.W. is less than 250 miles. The ratio of maximum depth to width is about 1 to 40, or that of a trough as wide as this printed page and one ninth of an inch deep. The depth of the strata, 40,000 feet, gives for the temperature at the bottom of the geosyncline (supposing the rate of downward increase to be 1° F. for each 50 feet of descent) 800° F. Consequently an expansion of 2·75 feet for 250 miles of width and for each 100° F. amounts to 5500 feet, or a little over a mile. Lesley makes the actual shortening over the breadth of the geosyncline in Pennsylvania, in consequence of the flexures, to be 44 miles, and Claypole 88 miles. The discrepancy is too large to be removed by questioning either estimate. Many of the single folds would use up several times the 5500 feet. So it is in other cases.

In the Laramide Range, of southern British America, a thickness of the rocks in the geosyncline of 34,000 feet, and the width of the trough about 150 miles, give for the temperature of the bottom about 700° F.; and the expansion, under these conditions, would be only 2900 feet for the whole width. The displacement *horizontally* of *one* of the several faults, according to McConnell, is 7 miles, or nearly 13 times the maximum allowed for the range by the theory under consideration. In the Juras, Heim found the contraction by flexures to be 3 miles, or one fourth, for the distance between Lake Geneva and Saint Claude; and in the eastern Jura to be 4 miles in a breadth of 7 miles.

There is the further objection to the theory that in a trough, having the depth only a thirtieth or a fortieth of the breadth, the expansion would act nearly equally in all directions; so that while longitudinal ridges might prevail, transverse should be common instead of uncommon. But the expanding effects from the heat of successive igneous intrusions are to be added, according to the theory, ridges thus succeeding ridges. In the case of the Appalachians, there were no igneous intrusions along the chief part