

The number of earthquakes is about twenty annually, corresponding to the number of volcanic eruptions.

The effects of earthquakes in changing levels may not be permanent, because a depression of a tract may be counterbalanced by a subsequent elevation.

THERMAL SPRINGS.

Hot springs are very common in the vicinity of volcanoes; such as the well-known geysers in Iceland. Some of these are intermittent, probably in consequence of the agency of steam within subterranean cavities. The great geyser consists of a basin fifty-six by forty-six feet in diameter; at the bottom of which is a well ten feet in diameter and seventy-eight feet deep. Usually the basin is filled with water in a state of ebullition; but occasionally an eruption takes place, by which the water is thrown up from 100 to 200 feet, until it is all expelled from the well, and there follows a column of steam with amazing force and a deafening explosion, by which the eruption is terminated. These waters hold silica in solution; as do those of the Azore Islands; and extensive deposits are the result. The coating over of vegetables by this silicious matter, has given rise to the common opinion that certain rivers and lakes possess the power of rapid petrification.

Fig. 123 represents the great geyser of Iceland in action.

Thermal springs are not confined to the vicinity of volcanoes. They occur in every part of the globe; and rise out of almost every kind of rock. They frequently contain enough of mineral substances to constitute them mineral waters. But one of their most striking properties is the evolution of gas; such as carbonic acid, nitrogen, oxygen, sulphuretted hydrogen, etc., in a free state.

Theory of Thermal Springs.—When these springs occur in volcanic districts, their origin is very obvious. The water which percolates into the crevices of the strata becomes heated by the volcanic furnace below, and impregnated with salts and gases by the sublimation of matter from the same focus. The thermal springs not in volcanic districts, in a large majority of cases rise either from the vicinity of some uplifted chain of mountains, or from clefts and fissures caused by the disruption of the strata; and therefore, in all such cases are probably the result of deep-seated volcanic agency, which may have been long in a quiescent state.