

have a temperature of  $100^{\circ}$ : accordingly, if through a fissure of sufficient length the rain-waters descend to this depth, they are heated up to  $100^{\circ}$ : the heat increases their lightness—they rise to the upper portion of the column of water—and if on their passage they encounter a free channel opening externally, they come forth into the light of day with a more or less elevated temperature.

Thermal waters abound in volcanic formations; because the eruption of igneous matter, fused in the interior of the globe, has partially opened up the vertical or sinuous channels by which the waters penetrate to great depths, are heated at these points, and escape into another part of the soil, with the elevated temperature obtained from the low-lying strata, and the sulphurous compounds which they have absorbed during their contact with the volcanic products. For this reason, sulphurous thermal springs are very numerous in the region of the Pyrenees, in Auvergne and the Alps, in France, in Sicily and the environs of Naples, and in many parts of Italy.

Captain Burton, in his expedition to the Lake-Region of Central Africa, met with thermal springs in the district of Zoungomero, an unhealthy, humid, and sulphurous country, which the traveller crosses on his route to the mountain-chain of Ousagara.

The same enterprising traveller visited, in 1860, the celebrated *Hot Springs* of Utah, in North America, which are situated about two and a half miles from the Mormon capital, the so-called "City of the Saints." They issue from the western face of the neighbouring mountains, escaping in an abundant flood from the solid rock, behind Ensign Peak, and falling into a basin, whence they overflow into a little lake, about one to three miles in circumference, according to the season.\* Where the water first issues, it will boil an egg; a little lower down its temperature is  $128^{\circ}$  F. At a considerable distance from the spring it still preserves a certain degree of warmth. It is frequented in winter by troops of waterfowl, which flock thither for the purpose of warming themselves; and by the children of the

\* [Captain R. F. Burton, "The City of the Saints," pp. 288, 289.]