Lisbon, and threw out hot water; at the same period the warm saline springs at Moutiers ceased to flow for forty-eight hours. When the water returned, the quantity was said to be increased, and the saline impregnation was weaker. Former and more formidable agitations of the earth are recorded in the Haut Valais, particularly in the district where the principal hot springs are situated. The last earthquake of consequence in the Valais took place in January, 1803.

I am informed that several of the retired valleys on the Italian side of the Alps, at the foot of the central chain, are subject to earthquakes, during which the ground has opened or sunk down in various parts, though these effects have been too local, to excite attention at a distance. From these facts, it seems as reasonable to infer that the thermal waters of the Alps owe their high temperature to subterranean fire, as that the hot springs in countries that have formerly been volcanic, derive their warmth from an internal, unextinguished, but quiescent, source of heat. No person who has attentively examined the lofty granitic plain to the west of Clermont Ferrand in France, and observed the granite in various parts pierced through by ancient volcanoes that have poured currents of lava over its surface, or seen other parts, where the granite itself has been changed by its contiguity to subterranean fire, or upheaved and intermixed with volcanic rocks; no one, I say, who has observed this, can doubt that the hot springs of Mont d'Or and Vichy, derive their high temperature from a source of heat situated beneath the granite mountains, though ages have passed away since the volcanoes of that country have been in an active state, and the only proof of the present existence of subterranean fire in Auvergne, is to be found in the hot springs themselves. Nor can any adequate reason be assigned, for attributing the high temperature of the thermal waters in the Alps, to any other cause than to a source of subterranean fire under these mountains,—a cause which is sufficient also to have produced their original elevation. It is, however, proper to state, that in some of the mountains of the Alps, the temperature may be slightly increased by a cause hitherto unnoticed. In the upper part of the secondary formations covering the granite, there are beds of gypsum, and this gypsum is anhydrous; but when exposed to air and moisture, it combines with water, and passes to the state of common gypsum: during this combination we may suppose heat to be evolved; but the process must be extremely slow, and the heat evolved, must be totally inadequate to raise the temperature of powerful streams to 126°. Saussure found the temperature of the water in the lower part of the salt mines of Bex, which are situated in the vicinity of gypsum, to be four degrees of Reaumur higher than the mean temperature of the earth. It is not improbable, though Saussure was not aware of the circumstance, that this small increase of temperature in the mines of Bex, might be partly owing to the combination of water with gypsum: however, an increase of temperature, it is well known, is observed in deep mines, far removed from the gypsum formation.

In reply to what I have advanced respecting the thermal waters in the Pennine Alps, it may be said, that few thermal springs have been yet discovered in the northern range of the Alps which form the Ber-