

*saline contents*; and evolve *no gases*. The two former rise in mica slate, the latter at the junction of granite and limestone.

Those of *Enaldes*, *Dorros*, and *Los* rise at the boundary of granite, with temperatures  $47.1^{\circ}$ ,  $44.4^{\circ}$ , and  $24.2^{\circ}$  above the vicinity; contain very little saline admixture (1 grain hydrosulphuret of soda, &c.); and yield nitrogen gas only.

The waters of *Barège* and *Cauteretz*, in the Pyrenees ( $51.9^{\circ}$  and  $70.1^{\circ}$  above the temperature of the place), rise in primary rocks, and yield nitrogen only.

The baths of *Louèche* ( $74.1^{\circ}$  above the temperature of the place) yield nitrogen only.

To complete this view of the chemical characters of hot springs, we may notice some of those which rise in volcanic countries.

At *Mont Dor*, Cæsar's Bath rises in trachyte, with a temperature  $52^{\circ}$  above that of the country; contains of saline ingredients 11.4 grains in a pint (carbonate, muriate, and sulphate of soda); and evolves 9.85 nitrogen, 0.85 oxygen, and 90 carbonic acid.

The springs of *Chaudes Aigues*, near Aurillac, rise in gneiss, with a temperature  $118^{\circ}$  above that of the place; contain 14.5 grains of saline ingredients in a pint (carbonate and muriate of soda, magnesia, lime, and oxide of iron); evolve from 12 to 30 nitrogen, 1 to 15 oxygen, 57 to 87 carbonic acid.

None of the facts disclosed by chemical analysis of these springs, justify the belief that it is to any peculiar chemical action in their channels that their heat above the atmosphere is owing. On the contrary, their heat is derived by communication from *the heated rocks through which they pass*, whatever may be the cause of their chemical differences. (See professor Forbes's remarks, *Phil. Trans.* 1836, p. 576.) That the heat of the rocks, and therefore that of the springs, is derived from volcanic action, appears to Dr. Daubeny probable, because nitrogen gas, so commonly evolved from hot springs, is also a product of volcanos, both subaërial and submarine, and because "the majority of thermal waters arise, either from rocks of a volcanic nature, from the vicinity of some uplifted chain of