

of springs in volcanic regions, the original source of salt may be as deep seated as that of lava.

Many springs in Sicily contain muriate of soda, and the "fume salso," in particular, is impregnated with so large a quantity, that cattle refuse to drink of it. A hot spring, rising through granite, at Saint Nectaire, in Auvergne, may be mentioned as one of many, containing a large proportion of muriate of soda, together with magnesia and other ingredients.*

Carbonated springs. — Auvergne. — Carbonic acid gas is very plentifully disengaged from springs in almost all countries, but particularly near active or extinct volcanos. This elastic fluid has the property of decomposing many of the hardest rocks with which it comes in contact, particularly that numerous class in whose composition felspar is an ingredient. It renders the oxide of iron soluble in water, and contributes, as was before stated, to the solution of calcareous matter. In volcanic districts these gaseous emanations are not confined to springs, but rise up in the state of pure gas from the soil in various places. The Grotto del Cane, near Naples, affords an example, and prodigious quantities are now annually disengaged from every part of the Limagne d'Auvergne, where it appears to have been developed in equal quantity from time immemorial. As the acid is invisible, it is not observed, except an excavation be made, wherein it immediately accumulates, so that it will extinguish a candle. There are some springs in this district, where the water is seen bubbling and boiling up with much noise, in consequence of the abundant disengagement of this gas. In the environs of Pont-Gibaud, not far from Clermont, a rock belonging to the gneiss formation, in which lead-mines are worked, has been found to be quite saturated with carbonic acid gas, which is constantly disengaged. The carbonates of iron, lime, and manganese are so dissolved, that the rock is rendered soft, and the quartz alone remains unattacked.† Not far off is the small volcanic cone of Chaluzet, which once broke up through the gneiss, and sent forth a lava-stream.

Supposed atmosphere of carbonic acid. — Prof. Bischoff in his history of volcanos‡, has shown what enormous quantities of carbonic acid gas are exhaled in the vicinity of the extinct craters of the Rhine, (in the neighbourhood of the Laacher-see, for example, and the Eifel,) and also in the mineral springs of Nassau and other countries, where there are no immediate traces of volcanic action. It would be easy to calculate in how short a period the solid carbon, thus emitted from the interior of the earth in an invisible form, would amount to a quantity as great as could be obtained from the trees of a large forest, and how many thousand years would be required to supply the materials of a dense seam of pure coal from the same source. Geologists who favour the doctrine

* Ann. de l'Auvergne, tome i. p. 234.

‡ Edinb. New Phil. Journ. Oct.

† Ann. Scient. de l'Auvergne, tome ii. 1839.
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