

itself of this artificial channel of escape, and will rise in the hole, or even gush out as a *jet d'eau* above ground. Wells of this kind are now largely employed. They bear the name of *Artesian*, from the old province of Artois in France, where they have long been in use⁷⁸ (Fig. 106).

That the water really circulates underground, and passes not merely through the pores of the rocks, but in crevices and tunnels, which it has no doubt to a large extent opened for itself along natural joints and fissures, is proved by the occasional rise of leaves, twigs and even live fish, in the shaft of an artesian well. Such testimony is particularly striking when found in districts without surface-waters, and even perhaps with little or no rain. It has been met with, for instance, in sinking wells in some of the sandy deserts on the southern borders of Algeria.⁷⁹ In these and similar cases, it is clear that the water may, and sometimes does, travel for many leagues underground, away from the district where it fell as rain or snow, or where it leaked from the bed of a river or lake.

The temperature of springs affords a convenient, but not always quite reliable, indication of the relative depth from which they have risen. Some springs are just one degree or less above the temperature of ice (C. 0°, Fahr. 32°). Others, in volcanic districts, issue with the temperature of boiling water (C. 100°, Fahr. 212°). Between these two extremes every degree may be registered. Very

⁷⁸ See Prestwich Q. J. Geol. Soc. xxviii. p. lvii., and the references there given. One of the best recent essays on the subject of Artesian Wells is that by Prof. T. C. Chamberlin in the 5th Annual Report of the U. S. Geol. Survey (1883-84), p. 131.

⁷⁹ Desor, Bull. Soc. Sci. Nat. Neuchâtel, 1864. On the hydrology of the Sahara consult G. Rolland, Assoc. Française, 1880, p. 547. Tchihatchef, Brit. Assoc. 1882, p. 356. Choisy, "Documents relatifs à la Mission dirigée au Sud de l'Algérie." Paris, 1890.