We infer from this theory: 1. If any water bearing stratum, passing under a place where boring is attempted, rises higher at any point of its prolongation than the surface where the boring is made, the water will rise above that surface, and it will fall as much below that surface as is the level of the highest part of the pervious stratum.

2. Hence borings of this sort may fail; first, because no water bearing stratum is reached; and, secondly, because that stratum does not rise high enough above the place to bring the water to the surface.

3. These explorations have proved that subterranean streams of water exist; some of which have a communication with the water at the surface.

EXAMPLES.—At St. Ouen, in France, at the depth of 150 feet, the borer suddenly fell a foot, and a stream of water rushed up. At Tours the water brought up from the depth of 374 feet fine sand, vegetable matter, and shells of species living in the vicinity, which must have been carried to that depth within a few months preceding. In Westphalia the water brought up several small fish, although no river existed at the surface within several leagues. The borings in the United States prove that cavities containing water exist even in granite.

Depth of the Borings.—One of the deepest wells in this country is at Louisville, Kentucky. It is 2,086 feet deep. It discharges 330,000 gallons of water every twenty-four hours, which rises to the height of 170 feet above the surface. The aperture is three inches in diameter. The water is much warmer than the average of the surface water, being 76½°, and it is unaffected by the external temperature. In Columbus, Ohio, one of these wells was 1,858 feet deep in December, 1858, and is said to have been carried several hundred feet lower since that time. In Paris there is an artesian well at Grenelle, 1,800 feet deep, and capable of producing 14,000,000 of gallons of water daily. At Niondorf, in Germany, there is one 2,247 feet deep. In the Duchy of Luxembourg, an excavation was made several years ago, to reach a stratum of salt water, which had been carried to the depth of 2,336 feet, in 1847.

Natural deserts may sometimes be changed into regions of fertility by these wells. Several wells have been bored in the Llano Estacado, in Texas, but we believe without much success. Upon the great desert of Sahara, in Africa, five of these wells, called "Wells of Gratitude," have been excavated, to the great relief of the nomadic tribes roaming there, as well as of travelers.

Thermal Springs will be considered elsewhere.

Mineral Springs.—All waters found naturally in the earth contain more or less of saline matter; but unless its quantity is so great as to render them unfit for common domestic purposes, they are not called mineral waters.

The ingredients found in mineral waters are the sulphates of ammonia, soda, lime, magnesia, alumina, iron, zinc, and copper; the nitrates of potassa, lime, and magnesia; the chlorides of potassium, sodium, ammonium, barium, calcium, magnesium, iron, and manganese; the carbonates of potassa, soda, ammonia, lime, magnesia, alumina, and iron; the silicate of iron; silica, strontia, lithia, iodine, bromine, and organic matter; the phosphoric, fluoric, muriatic, sulphurous, sulphuric, boracic, formic, acetic, carbonic, crenic, and apocrenic acids; also oxygen, nitrogen, hydrogen, sulphureted hydrogen, and carbureted hydrogen.

Theory.—Many of the above ingredients are taken up into a