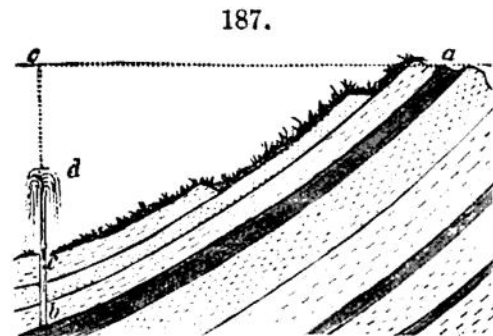


hence that the pressure is rarely, if ever, due, as has been supposed, to the pressure of confined gas. The facts exhibit on a grand scale the influence of a large elevated lake on the conditions of subterranean pressure.

Wherever subterranean water flows between nearly impervious sloping layers, so that it is confined to a given channel, it is like the water in a long inclined tube; and on opening a hole through the overlying material it will rise in a jet, owing to the hydrostatic pressure. The height of the jet so produced is that of the source, diminished by the loss from friction and the resistance of the air; it may be hundreds of feet.

In the annexed cut (Fig. 187), *ab* represents a water-supporting layer; *bc*, the boring; and *cd*, the jet of water. Such wells are called Artesian wells, as they were first made in the district of Artois, in France. They are now an important means of securing water for irrigation and other purposes in various parts of the world. By this means abundant water is now obtained even on the seacoast region of New Jersey, from Cretaceous and Tertiary strata, and over various parts of the dry regions of Montana, Colorado, and Nevada, where arid sands have been covered thereby with foliage. But if the rocks are porous throughout, with no impervious layers, boring is of no avail. Borings in regions of metamorphic or crystalline rocks generally prove failures unless a chance bed of decomposed rock extending down from the surface should be reached; for such rocks have been consolidated and crystallized while under heavy pressure. Where slates are vertical, a horizontal boring across the bedding may give a constant stream; but such a source is a small one.



Section illustrating the origin of Artesian wells.

3. *Denudation; Transportation.*—Subterranean rivers have sometimes large size, especially in limestone regions, where excavation is easy, as explained on page 130, under Chemical Geology. Those of the caverns of Kentucky and Indiana have their cascades, like ordinary rivers, and may be navigated for long distances. Into such caverns rivers sometimes enter and become “lost rivers;” while from others issue great streams, whose source is unknown. The cave of Adelsberg, 22 miles northeast of Trieste, has its river; and the Jura Mountains send forth streams to daylight full grown. The work of denudation and transportation is like that above ground, although less supplied with materials for transportation and wear.

Subterranean waters do much efficient work in a quiet way by the transportation of sand along the course of streamlets that have their outlet at the base of bluffs. The undermining of centuries in this way may make chambers that lead to the sinking of masses of the land, and determine lines of surface drainage.