below, which slopes 1 : 425 feet, or 12½ feet per mile. The discharge of water at sea level is so large, although dependent solely on the rains, that the city of Brooklyn, containing nearly a million inhabitants, has derived from it its supply of water through a series of reservoirs, constructed a little above the sea level. The water-plane is not that of a hard-pan layer. Its position has been determined by well-digging. Out of the 42½ inches of rain (snow included) which annually falls, nearly 40 per cent becomes absorbed and subterranean. The Brooklyn engineer, Mr. T. Weston, observes that these subterranean waters supply the small streams of the surface with the chief part of their water, and discharge a large amount into the sea; and after a careful survey of a part of this southern slope, east of Brooklyn, 73·64 square miles in area, he reported that the water supply from the surface streams was, on an average, 22 per cent of the precipitation, or 30,000,000 gallons a day; that 15 per cent additional came out along the shores of the bays; and that at least 40,000,000 gallons per day might be obtained in reservoirs by proper arrangements. Mr. Weston holds that the water-plane is the upper limit of a water region which extends from this plane downward to and below the sea level, and that there is no hard-pan layer underneath. Friction and capillarity in the sands give it its height.

A coral island but ten feet high and a few hundred yards wide, and consisting of coral rock up to the water level with coral sands above, generally yields, on digging down to the surface of the coral rock, a sufficient supply of water for its inhabitants, and all of it has come from the rains. The fresh water, moreover, is sufficient to exclude, by its seaward pressure, all ingress of salt water. If this is true on a coral island, the subterranean waters derived from the rains over larger lands should be very great. Moreover, the salt waters of the ocean do not penetrate far into the basement of a continent. An island may receive sea water to its center at some unascertained depth below the sea level; but not so a continent.

2. *Force of flow.* — The force of the flow of subterranean waters is due to gravity, like the flow of surface waters. There is everywhere hydrostatic pressure, varying directly with the height of the supply, *minus* the loss by friction and capillarity. The height may be that of the neighboring hills, or of distant mountains, according to the range of the sloping rock-layers along which the water descends. It may be that of lakes small or large, for these bodies of water have the double duty of supplying above-ground and under-ground streams. While the hydrostatic pressure varies with the height of the water-supply, the extent of the region served by a single source will depend on the area of that source.

Professor Edward Orton, of Columbus, Ohio, has proved that the hydrostatic pressure in the Findlay oil-region, and also in Indiana, where the borings descend to the Trenton limestone, reaching it at various depths to 1000 feet or more below the surface, *is determined by the waters of Lake Superior.* The level of the lake is 600 feet above tide level; and by adding this height to the number of feet at which the Trenton lies, in any case, below tide level, and calculating the hydrostatic pressure on this basis, he has found that it corresponds closely with the actual gas pressure at each boring. He holds that this hydrostatic pressure determines the gas pressure in other regions; and