HYGIENE.

Public Water Supplies.

[Correspondence on this subject is specially desired.—ED.]

There is probably nothing which is a better index of the growth of the principles underlying the maintenance of individual and public health than the fact that on every side, in Britain, the United States and Canada, we have even village communities intently studying the question of how they shall be able to obtain wholesome, abundant and economical supplies of water for domestic and public purposes. In Ontario, the past, much more than any other year, has seen active works undertaken by a number of municipalities and many more are investigating the local source of supply.

In reviewing the question of public water supplies it may be said that, as usually stated, there are three sources from which we in Canada draw public water supplies. We have, more than almost any portion of the world, water supplies without limitation in our great lakes and the many smaller lake basins, situated in many parts of the country, in our rivers and in subterranean waters. Regarding the great lakes supply, with the adoption of some of the most elementary sanitary principles as regards their pollution at points near to the supply-pipe of a town, it may be said that the question of using such first-class water becomes simply an economic one; but when we enquire as to the advisability of utilizing river water for public supplies it becomes at once apparent that we have two points of the greatest importance to consider, viz.: contamination of the water, 1st, by vegetable debris; 2nd, by animal pollution from cities and towns. From past experience, both on the continent and in America, it may be said that when other sources are available they are to be preferred to water taken from streams which are either highly polluted with vegetable debris or by the sewage of towns situated higher up. While the oxidation of organic matter does go on, still evidence is daily accumulating that, where populations are yearly increasing, sufficient purification by natural processes does not take place; certainly not in those cases where the specific poisons of zymotic diseases, as cholera, typhoid, etc., are conveyed to the stream by sewage.

The third source, that of subterranean waters, had hardly begun to be abandoned after the universal condemnation of the ordinary wells in cities, towns, etc., where sources of pollution are contiguous, when local necessities have developed the fact that artesian wells are possible in many places; or, when not, natural water from similar strata may be obtained by applying steam pumping power. With the recent improvements in this class of wells, now usually called *drive* wells, many towns, especially in the western praries, have been supplied with very considerable amounts of water. Thus, out of forty-five towns in Iowa, supplied with public water, nineteen obtain their supplies from wells, some artesian and some *drive* wells. In the east the successful experiment of supplying Brooklyn with water by *drive* wells, on the *Andrew's* system, has led many inland places with no source of supply excepting streams of doubtful purity, either present or future, to examine into the merits of the system. Described in a word, this system, and others adopting the principle consists of pipes pointed, of, say, two inches in diameter, with perforated tubes, driven down until a water-bearing stratum, drawing its supplies from a considerable area, is reached. These pipes being driven at distances of a few feet apart, are all connected into a system iron mains of graduated capacity, leading to a pump. Through exhaustion the pipes are made to draw from a wide area, the amount pumped limited only by the capacity, and the extent of the water-bearing strata.

For the information of those of our readers all over the country, who, persuaded of the dangerous nature of the domestic supplies of many of our towns and villages, are seeking for a pure public supply, it will be of interest to indicate some of the requisite conditions for abundant subterranean supplies. Prof. Laveratt well points out the indications for an artesian well, which in certain particulars apply to all subterranean sources of supply. These are: (1) a pervious water-bearing stratum; (2) an impervious stratum below; (3) a second unpervious stratum above the water-bearing stratum; (4) these must be inclined; (5) there must be no adequate outlet for the water at a lower level than the water; (6) a sufficient collecting area or reser-