

nature's method is competent to effect perfect filtration, and this system is reported to be in successful operation in a number of the smaller cities in the United States. It has not, however, received the sanction of the most eminent sanitary and hydraulic engineers. Whatever may be the merits of this particular system it does seem reasonable to hope that in this age of giant inventors, some heaven-born genius may arise to bless mankind by the discovery of a perfect system of artificial filtration equal to that which is constantly effected by nature.

The third source of water supply from small streams commonly connected with lakelets or ponds, fed to some extent by springs, but chiefly collecting surface water of more or less considerable areas of land is substantially that used by the celebrated Croton Water Works, of New York, which collects its great supply from an area of 336 square miles of rainfall by the aid of immense reservoirs, settling basins, etc. The same system has been recommended for Toronto by Mr. McAlpine, of New York, but the recommendations apparently have not been received with much favour. A tender for works to supply the city of Brantford with water from this source of supply has recently been received though not adopted. It was proposed to use the D'Aubigny Creek, which is fed by a number of springs, and collects the rainfall of a valley several miles in extent. The water was to be stored in a pond of some 30 or 40 acres made by throwing an embankment about twelve feet high across the valley. There are serious objections to this source of supply. Irrespective of the offensive drainage of many farm premises, it is well known that the rainfall on growing soil and running into semi-stagnant ponds, is very favourable to vegetable and animal tainting. Water plants spring up and feed hosts of animalculæ, rendering the water unfit to drink. A green and offensive vegetation forms on the surface of such ponds, even when fed by the purest springs. Rich soils, such as those of the D'Aubigny valley, abound in organic matter, rotten vegetable fibres and the putrifying products of the animal and vegetable kingdom. In the opinion of Dr. Hassall such soils as a source of impurity rank next to sewage itself.

The fourth source of water supply I have mentioned is the subterraneous or so called living

springs. The city or town so situated as to be able to obtain a sufficient supply of good water direct from a spring or springs is very fortunate. The great city of London, deriving its supplies mainly from the Thames, is casting longing eyes towards the Welsh Mountains, the source of many rivers, with the desire to secure something approaching in character such a supply. Some continental cities are so fortunate as to have such supplies, and the immunity of such cities from attack in cholera epidemics has attracted much notice in Ontario. London, the less, has thus far been so fortunate as to obtain a sufficient supply from a series of springs. In Guelph it is stated that the supply from this source has proved insufficient and has had to be supplemented by water of a doubtful character pumped from the river Speed, a sluggish stream convenient to the pumping station.

The town of Paris obtains its supply from a single excellent spring giving an abundant supply of excellent water for public and private uses. This enterprising little town of some 3,000 inhabitants deserves the highest praise for establishing, at a cost of \$50,000, a perfect system of public water works.

Finally, there is the system of driven wells which is now in successful operation in very many cities in the United States. For this driven well or gang well system to be successful, it is essential that there should be a water bearing stratum sufficiently extensive and inexhaustible to afford a sufficient supply, and so situated, especially if its depth from the surface is not great, as to exclude reasonable fear of surface or other contamination.

In St. Thomas, Dr. Tweedale reports that an expenditure of \$600 has been made in unsuccessful tests as to the practicability of obtaining water there by this system. In Brantford a similar expenditure has been incurred, with the result of proving that an unlimited supply can be had, and tenders have been received for establishing works on this plan. If on full investigation there shall remain no doubt as to immunity from danger of contamination in the future, this system, somewhat modified, will probably be adopted.

It is believed that the supply of water in the extensive water bearing stratum of sand at Holmedale, about a mile above the city, is in some degree maintained by the rainfall of that locality, but probably chiefly by filtration from the Grand river