MUNICIPAL DEPARTMENT

SEWAGE DISPOSAL.

The city of London, Ontario, appears to be in earnest with regard to its sewage disposal. A few days ago Doctor Cl. T. Campbell, the Chairman of the Board of Health, laid before the members, among others, a report by Mr. C. G. Horetzky, Sanitary Engineer of the Provincial Government, upon that most important subject.

Several schemes were reviewed, but the simplest and most effective, and that most likely to be carried out in the end, appears to be Mr. Horetzky's, who recommends the utilization of the Cove lands for filtration purposes. Those lands can be reached by three different gravitation routes. The whole subject seems to have been thoroughly investigated, and the report, besides giving a succinct description of some important works in the States for purposes of comparison, lucidly sets forth the work necessary for a complete system of filtration, and gives details of every item of expenditure.

The cost of the disposal works alone, is estimated at $61,000, exclusive of sewerage.

In order to preclude the possibility of mistakes in a work involving such a considerable outlay, Mr. Horetzky advised that an engineer of the Massachusetts Board of Health should be called in to report further upon the scheme. This proposal is endorsed by Mr. Campbell. In this connection it may be stated that nearly all the sewage disposal works attached to different provincial institutions have been designed and carried out by Mr. Horetzky, who, during the past few years, has made a study of this important branch of engineering, and has visited and closely examined the best installations of the kind in the United States.

The finest plant yet constructed by the Provincial Government from Mr. Horetzky's plans, and which has, during the summer of 1895, been completed by him, is that of the Rockwood Hospital at Kingston. This is used solely for the chemical treatment of sewage, land disposal being in this case out of the question. The works, exclusive of the sewerage, comprise mixing apparatus for the application of the chemicals, tanks for the sedimentation of the sewage, and rapid artificial filters for the further purification of the sewage effluent which leaves the filters in as clear a state as the lake water. The most modern appliances are used, and the disposal of the sewage sludge, which has been a problem in nearly all works of the kind in Europe and America, has been successfully solved in these works, by an automatic contrivance devised by Mr. Horetzky.

Several kinds of chemical treatment have been tried here during the past summer, the Herring brine process, the ferozone, and at present the simple alum treatment, of 7 grains sulphate of alumina to every gallon of sewage.

The superintendent of the Hospital, Doctor Clark, speaks in the highest terms of the entire success of this latest effort on the part of the local Government in the inauguration of what, it is to be hoped, may result in a general system of sanitation throughout the province.

LOCATING A PUBLIC WATER-SUPPLY.

By Daniel W. Mead.
(Concluded.)

The stream-flow is largely derived from the ground water, which flows toward the river with a surface slope more or less rapid in accordance with the porosity of the water-bearing strata in which it occurs. It is seldom that the water flows from the river to the land, even in extreme high waters; for the rivers, especially in high waters, carry much silt, and an outward current soon stops all pores by filling them and makes a practically impervious bed. This is the cause of failure in filter galleries which depend on the seepage of rivers for their supply. The streams sometimes flow through beds of sand and gravel, the visible stream being but a portion of the whole, including the invisible one which flows around and under it. This phenomenon is not largely developed in this area in any one stream, but is locally developed on most of the streams. The possibility of utilizing such ground waters by large wells, drive wells, or filter galleries will be readily understood. These beds of sand and gravel are sometimes continuous for great distances, and, being surrounded by comparatively impervious clay, they exist in what may be called underground reservoirs or lakes, or, as broad underground streams, flow through the gravel and sand toward their outlet in some distant watercourse. They derive their supply directly from the rainfall on their watershed, the extent and character of which is usually difficult to determine, though on these features the availability of such sources for large water supplies depends.

Surface and ground waters are liable to be contaminated by any organic filth on their watersheds. These waters are seriously affected by the settlement of the country. In many places where the population is still small and scattered these waters may be pure and satisfactory for domestic use. But along the streams where the larger cities are situated and in all thickly inhabited localities the increase of population has rendered them unfit for use. The streams are now often used as the dumping-ground of waste materials, both liquid and solid, and, although stringent sanitary laws may in the main prevent gross pollution of these watercourses, it can never keep from them all of the liquid and solid accompaniments of a dense population. Waters once receiving organic matters retain them indefinitely, for, although the comparative amounts may be lessened by dilution, deposition, and bacteriological agencies, there is not a river long enough to entirely purify itself during its flow from source to sea, when once thoroughly contaminated.

The ground waters may, as a rule, be regarded as less liable to gross pollution than the open streams of the country, as they do not offer in such an unobstructed manner the temptation of the means of rapid disposal of waste. And, when only slightly polluted, the filtering qualities of the soil often afford a means of clarification, where the matter causing pollution is not too concentrated or constant in supply. Such sources of pollution as vaults and leaching cesspools, however, often overtax the purifying powers of the soil, and cause a local pollution of the ground water even more dangerous than that of the polluted streams.

The fact of the limited occurrence of water in all strata has been already noted; hence, if the amount of water needed is small, the drill will find it in almost any deposit in amounts proportional to the porosity of the stratum or the occurrence of cracks and fissures in it. Outside of this general consideration, several deposits are especially important for their water-bearing qualities. Of these, the Potsdam sandstone is the most important. It has an outcrop of about fourteen thousand square miles, affording an ample watershed. From this source are derived numerous artesian and deep wells, which have been developed throughout the extent of the outcrop. The St. Peter sandstone is next in importance in this area as a source of water. Its outcrop extends over about three thousand square miles, and in a large part of this area it lies above the Potsdam and is first encountered by the drill. Its elevation is, however, less than that of the Potsdam, and hence its waters have not usually as great a head, and consequently do not as often furnish flowing wells.

The drift deposits are sometimes so extended that they may produce all phenomena observable in the lower strata, such as artesian flows and copious springs at numerous points within this area. Many of the other deposits of this area may be made available as sources of water-supply by driving infiltration tunnels through their mass, the tunnels being of sufficient extent to produce the necessary amount of water.

The deep and artesian waters often flow through miles of material and are effectually filtered from all organic contamination, and, if unpolluted at their outlet, are organically pure. Wells drawing their water from such sources offer a supply second to none in organic purity and freedom from all risk of contamination. While the deep waters are organically pure, they are very likely to contain much larger percentages of inorganic salts than surface waters.

Enough has been said to show that, in searching for the most favorable water-supply, it is important that local conditions be ascertained and local geology and topography understood, in order that all possible sources may be known and the probable cost of obtaining water from each and the probable quality and quantity of the same may be judged.

PERSONAL.

Mr. E. Berryman, C. E., of Sherbrooke, Que., has resigned his position as Chief Engineer of the Quebec Central railway, and will take up his residence in Montreal.

Mr. A. W. Campbell, C. E., of St. Thomas, who has been prominently associated with the Good Roads movement since its inauguration, has been appointed to the position of Provincial Highway Commissioner by the Ontario Government. The office has recently been created, the salary being $1,500 per year.

Mr. George Gould, of Walkerton, Ont., who for many years held the position of clerk of the county of Bruce, but who was recently compelled to resign owing to ill-health, died at his home on the 23rd of February. He had reached the age of 76 years, being one of the pioneers of that district. In his death the county loses an efficient servant and respected resident.