

been imported from Scotland till lately, when they were cast in the city. Those made in city were cast on their sides. A short distance of the supply main was laid with leaded joints. The superintendent informed the writer he found the change of temperature in the water affected the leaded joints, and that they began to leak after two years, and had to be attended to every second year. The turned and bored joints had never given him any trouble. This seems to be an unusual experience.

House services are of lead, stop cock boxes are of cast iron, placed over the valve, close to the main, and not in the service on the sidewalk.

Fire hydrants are of the Leadbetter pattern, which was the first one used here; it has been adopted ever since.

Public fountains are scattered over the city; they are constant flowing, discharging from two to four and in a few cases more gallons per minute. Self-acting and closing valves are now being attached to the fountains.

There are about:

9½ miles of mains.

2000 house services.

165 fire hydrants.

70 public fountains.

The quality of the water is good, soft, pure, potable water, well adapted to culinary and dietetic purposes. It is rather hard on steam boilers, pitting the shells and tubes severely. The latter have to be renewed frequently, inferiors ranging from six to twelve months.

The supply main from the lake was cleaned out in 1885, by Mr. H. C. Burchell, M. Can. Soc. C. E., during Mr. Martin's absence on sick leave. The writer is very pleased to state that Mr. Burchell will shortly give to the Society a paper on this very interesting piece of work. The pipes have been cleaned out every two years since that date (1885), about a quarter of an inch of rust or incrustation forms in that time. A description of the present method of cleaning the pipes will be given by the writer as an addendum to Mr. Burchell's paper.

The position of many of the lakes is remarkable, they are on the highest points of the water shed. Windsor Lake has a water shed to its south of perhaps eight square miles, otherwise it is at the highest point of land. The level was raised 9 feet when the works were constructed; the top of the intake pipe is 6 ft. 6 ins. below high water, and 2 feet 9 ins. below low water. The water is drawn from the shallowest end. Had the pipe line been carried up the valley immediately to the north of its present line, a much more uniform hydraulic grade could have been established, and water drawn where the lake is 40 feet deep. The lands immediately surrounding the lake are nearly all controlled by the City, who now own the water-works.

A small dam of rip rap encloses an area of about half an acre, in which the intake pipe is placed. A good deal of trouble was experienced from anchor ice; this has been cleverly overcome, by forming a number of telegraph poles into an open raft. They are fastened together by wire, about 10 feet apart, and anchored over the mouth of the pipe. The ice forms quickly between them, and prevents the formation of anchor ice.

The annual rainfall for the past six years is about 49.15 ins. per annum. A careful record of water level since the commencement has been kept by the superintendent, who kindly permits its publication in this paper. The gradual fall in the lake level is due to the equalization of the discharging capacities of the supply main.

There are good reasons for believing the lake is supplied by springs: it is the last sheet of water in the neighbourhood to freeze, and the last to thaw out in spring.

The works were constructed by a joint stock company with a capital of \$400,000, the interest of which was guaranteed by the Government, who afterwards purchased the works, and handed them over to the City, bonding the cost of them at \$423,860.

The estimated revenue is \$30,000 per annum.

#### SEWER AGE.

The natural water course which intersected the city became in course of time more or less polluted by sewage. Large stone drains or culverts, rectangular in section, were built from time to time on the lines