

## THE WATERWORKS OF WINNIPEG, MAN.

There is no Canadian water-works system which presents more features of interest to the engineer than that of Winnipeg Man. The first work were constructed by a private company, but ten years ago the city authorities decided that municipal ownership offered the only way to obtain a satisfactory service for a place growing so rapidly as this. Two years were spent in obtaining the necessary legal powers for this purpose. The old works were then bought for \$237,000, and their extension and improvement were immediately undertaken. All this work has been under the charge of Col. H. N. Rutten, city engineer.

Two sources for a municipal supply were investigated, the Assiniboine and Red rivers and ground water. An examination of the river from Portage la Prairie to Winnipeg disclosed the fact that the Assiniboine was the main sewer of the country—offal was gotten rid of by throwing it into the river, enclosures for cattle and pigs were fenced with a corner in the river, and barnyards

were drained into it. It was felt that even the most perfect filtration would not remove the disagreeable impression, that after all, the water was nothing more or less than purified sewage, and that the only excuse for its adoption as a permanent supply for the city would be that it was the only one available. With the exception that the flow was larger, and water softer, the same objections applied to the Red River. It was found that in addition to its great cost, the Winnipeg River water would require to be filtered to remove the large quantities of the suspended organic matter which it contained.

One of the ground water sources investigated was at Poplar Springs,  $17\frac{1}{2}$  miles from the city, where there is a large amount of water available. The cost of bringing it to the city will be large, however, and for this reason it is considered best to defer its use until later. There is a large amount of ground water within and near the city and investigations of its quality and quantity were made. Tests with

the air lift showed that the water in all the wells was under the same head, and it is considered likely that the artesian basin is supplied from a number of sources. After a full review and investigation of the situation by Mr. Rudolph Herring, consulting engineer, of New York, it was decided to sink a pump well. It was estimated that from this well and a line of conduit 5,000 ft. in length, connected to tube wells, a supply of 2,400,000 imp. gal per day could be obtained. After construction, it was found that the yield from this well alone, at a pumping depth of 38 ft. below ground level, was upwards of 2,400,000 gal. per day, and this being more than sufficient for the requirement of the city at the time, nothing was done towards the construction of the tube wells and conduit.

It shortly became evident that the city was going to grow very rapidly and that something should be done towards increasing the supply. The great quantity of water obtained from the first well completely changed the aspect of the develop-

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| Year. | No. Samples Tested. | Soundness<br>Fajji Test. | Specific Gravity | Residue in<br>Test on<br>No. 100 Sieve | Setting Time<br>in Minutes |       | Tensile Strength in pounds per square inch. |      |       |        |       |                        |      |       |        |       |  |
|-------|---------------------|--------------------------|------------------|--|----------------------------|-------|---|------|-------|--------|-------|------------------------|------|-------|--------|-------|--|
|       |                     |                          |                  |  | Initial                    | Final | Neat.                                       |      |       |        |       | 3 (Sand) to 1 (Cement) |      |       |        |       |  |
|       |                     |                          |                  |  |                            |       | 1 dy.                                       | 7 d. | 28 d. | 3 mos. | 1 yr. | 1 dy.                  | 7 d. | 28 d. | 3 mos. | 1 yr. |  |
| 1903  | 20                  | O.K.                     | 3.135            | 2.1                                    | 162                        | 345   | 307   | 701  | 783   | 827    | *     | 74                     | 214  | 299   | 367    | *     |  |
| 1904  | 44                  | O.K.                     | 3.150            | 2.0                                    | 132                        | 342   | 300   | 744  | 848   | 914    | 938   | 86                     | 262  | 354   | 401    | 427   |  |

\* Tests for 1 year were not completed when records closed. 1905 report not yet issued.

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