

Report of City Water Commission.

Following is the report of the city water commission, submitted to the council at its meeting last evening:

To the Mayor and Aldermen of the City of Highland Park in City Couacil assembled:

FIRST—Your Commission has investigated the question of the necessity for adopting measures to purify the water supply of the city, and is strongly of the opinion that such measures should be quickly taken on the following grounds—

1st. It is proven by reports of examinations made by competent bacteriologists now on file, that the water is contaminated with sewerage at frequent intervals and that the public health has at times been affected thereby.

2nd. From a letter attached, from Assistant Health Commissioner of the city of Chicago, Dr. Frank M. Reilly, it is demonstrated that with the lapse of time the present unsatisfactory conditions of the water will be intensified.

SECOND—Your Commission has investigated the measures that can be adopted to purify the water, and find there are practically but two systems namely:

1st. The mechanical or rapid filtration.

2nd. The sand-bed or slow filtration.

The former method consists of wooden or iron tanks open or closed, containing sand or quartz of proper size. Extending into this bed of sand is what is termed an agitator which consists of a series of rakes revolving around a common center. The rate of filtration is from 90 to 125 millions gallons per acre in area of sand surface per 24 hours. The water is admitted on the top of the sand and passes through it. The elements relied upon in mechanical filtration to allow satisfactory results to be obtained at high rates, is alum or sulphate of alumina. This chemical is added to the water to be filtered and is decomposed into its component parts, alumina and sulphuric acid. The sulphuric acid remains in the water while the alum forms a gelatinous precipitate which sur-

rounds and entangles the fine suspended particles in the water and allows them to be removed much more readily than would otherwise be the case. Objection has been raised to the use of alum on hygienic grounds, but when due care is exercised in its use it is doubtful if it is ever really injurious to health.

Your Commission does not recommend the mechanical or rapid filtration method, although the initial cost of such a plant might be twenty per cent less, for the following reasons:

The life of such a plant is comparatively limited; the supervision must be close and unceasing, the agent employed is apt to be harmful and the cost of operation would be higher than the other method mentioned.

The sand bed or slow filtration method consists of passing water through sand contained in large masonry basins, thereby removing the suspended matter contained in the water. The filtered water is collected in under drains surrounded by gravel. These drains convey the filtered water to a well from where it is pumped to the city main. These filters are constructed in sections so that parts can be put out of service and the surface of the sand scraped while the other parts are furnishing the supply. The rate of filtration is much less than the mechanical system, being from two to four million gallons per acre per twenty-four hours. This system, however, requires no coagulant, and it should be borne in mind that there are other forces at work in filtering the water by means of sand than the mere straining of the water. One is known to be the action of the bacteria on the organic matter, termed the biologic action of the filter. The action of the minute organism in the water on the organic matter results in the production of a gelatinous film over and around the grains of sand in the upper layer of the bed which effectually retains the bulk of the suspended matter and bacteria on the surface, when the bed becomes clogged for the above reason, it has to be scraped, otherwise there is no

flow of water. The scraping is a simple process. It consists of removing $\frac{1}{2}$ inch to $\frac{3}{4}$ inch of the upper layer of sand, when the bed is again ready for use.

Your commission recommends the enlarging or extending of the existing system of water works for supplying water for public use and domestic use of the inhabitants of the city of Highland Park, by building a system of sand bed filters and acquiring such pumps, fixtures and appurtenances as may be necessary for the operation of the same.

In reaching this conclusion your committee has been guided by the results of exhaustive experiments which the above systems have been subjected to in other cities, and by the voluminous reports it has considered concerning the filtration of water of eminent scientists and engineers, from which it appears that the mechanical system yields effluents containing from two to three times as many bacteria as sand filters do, and are consequently two or three times as likely to transmit disease germs.

THIRD.—Your commission has requested the superintendent of water works, Mr. E. Laing, to prepare preliminary plans, specifications and estimates of cost of construction of an adequate sand bed system of filters with plans, specifications and estimates. It should be stated in this connection that the superintendent of water works has had the advantage of inspecting the system of sand bed filters which has been in satisfactory operation in Ashland, Wis., the past five years.

Your commission herewith begs leave to submit an ordinance providing for issuance of twelve thousand (12,000) dollars in certificates of indebtedness bearing interest at the rate of five per cent per annum, the principal payable one-half (six thousand dollars) in five years and the balance (six thousand dollars) in ten years.

All of which is respectfully submitted. CITY WATER COM.

[The ordinance was presented and will come up for passage on the 21st inst.]