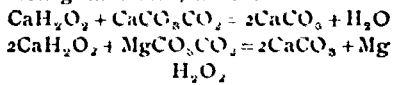


MUNICIPAL DEPARTMENT

THE MUNICIPAL WATER-SOFTENING PLANT AT WINNIPEG.

(Continued from last week.)

The chemical changes which take place in softening are stated by the Pittsburg Testing Laboratory as follows :



It is evident from the above that none of the lime used remains in the water, but that it separates as carbonate, bringing with it the previously hardening substances, the carbonates of lime and magnesium.

In carrying out this process on a large scale, the arrangement is as follows: The hard water is delivered through a 16-inch pipe to a weir box or measuring arrangement at a point about 30 feet above the prairie level. Here the water divides automatically into two parts, always in the same ratio to each other. The smaller part is mixed continuously with cream of lime, and made into lime water, which afterwards mixes with the hard water, and softens it in the way described above. As the making of the lime water requires a little time, it is so arranged that the water just starting to be made into lime water forces forward in a constant stream, to mix with the hard water, an exactly equivalent amount of lime water already formed.

In other words, the water to be made into lime water, as soon as it falls over the weir, displaces lime water already made. Mixed with cream of lime, it flows in at the bottom of the lime water tanks, where it rises steadily and clarifies, and eventually flows forward to mix with the hard water. There is thus a steady stream of clarified lime water being forced out of the lime water tanks by the water which is entering below, and the amount of this stream is always proportional to the hard water which it is to soften.

It is necessary, however, that the operatives take care that the lime water is always of the proper strength. This they ascertain by chemical tests. Measured samples of lime water are compared with a standard acid solution. If found under strength, cream of lime is supplied at a higher rate. If found over strength, the supply of cream of lime is diminished. Two gauges are on the side of the weir box. One shows how much hard water is being pumped to the plant. The other shows how much cream of lime is being used for making lime water. The amounts shown on the two gauges must be kept in a simple ratio to each other. When this is done, very little testing is required.

The apparatus for preparing and pumping the lime cream consist of a slaking bed, a mixing well and a ball valve pump. The speed of the pump is regulated from the operating platform.

The lime water is mixed thoroughly with the hard water in a baffle channel. Thence

the turbid soft water flows to the bottom of two large tanks, where it deposits nearly all of its suspended matter or sludge.

Rising slowly to the top, it flows off through floating discharge pipes to the filters, which give it its final clarification. A portion of the softened water is pumped from the top of the tanks to carbonating boxes, where it meets purified carbonic acid gas and absorbs it. This carbonated water flows into the floating discharge pipes, and passes with the rest of the softened water to the filters.

There are seven filters, each one containing about 1,450 square feet of filter cloth surface. Each filter runs about 24 hours. It is then opened and the cloths are removed, washed and replaced.

The softened and filtered water passes into a 300,000 gallon service reservoir, whence it is pumped to the city.

On account of the high price of good lime in Winnipeg, the recovery of the waste lime from the softening process is being seriously considered. This would require a plant for purifying the sludge by removing the magnesia. Presses, drying apparatus and special kilns would also be needed. It would be possible, however, to make high-grade lime for about one-third of what it is now costing.

LEGAL.

Mr. Rines, the Corporation Counsel or City Solicitor of New York, has expressed the opinion that it is illegal for municipal authorities to stipulate in their contracts that only union labor shall be employed on their works. Such a stipulation, he says, establishes an illegal discrimination between different classes of citizens, while at the same time preventing legitimate competition among contractors.

Mr. Hutcheon, city engineer of Guelph, Ont., has tendered his resignation.

The septic tank sewage system installed about two years ago by the city of Vancouver, B.C., has proved so successful that the officers of several municipalities in the near-by States have recommended the introduction of the septic tanks in their cities. There are three tanks, located at different points in the city. One of these disposes of the sewage of a district having a population of 5,000 people.

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