

THE Sanitary Review

SEWERAGE, SEWAGE DISPOSAL, WATER SUPPLY AND
WATER PURIFICATION

CONSERVATION OF QUANTITY AND PURITY OF WATER IN THE PROVINCE OF SASKATCHEWAN.

"To the West, to the West, to the land!" (of scarcity of water?)

Is there a scarcity of water in the Province of Saskatchewan?

From the lips of the pessimist one hears the remark: "Saskatchewan may be producing twice the quantity of wheat over any other two Western Provinces combined, but the water problem is the great difficulty."

It is true—everlastingly true—that a population can only grow to the extent of its available pure water supply in the proportion of about one person to each available 11,000 gallons per annum, viz., a daily consumption rate of about 30 gallons per head.

Grain elevators, railway facilities and wheat-producing land will never maintain a city population of 10,000 people unless there is an accompanying water supply of 300,000 gallons per day.

The scarcity of water in Saskatchewan is more apparent than real.

There is an abundance of water throughout the whole Province; it is only a question of conservation of quantity and purity.

Let us examine the question, and provide a few facts which the pessimist may digest at his leisure.

The Province is endowed with two large rivers, the North and South Saskatchewan, which find their source in the Rocky Mountains, and drain the plains of Alberta. The rivers respectively each have a normal flow of about 26,000,000 cubic feet per minute.

Apart from these great rivers, however, we have the rainfall over the Province itself.

Allowing an annual rainfall of 12 inches, all that part of the Province south of Prince Albert receives annually 1,238,360,000,000 gallons of water.

About half is evaporated directly back to the atmosphere, leaving 7,119,180,000,000 gallons.

Two-thirds of the latter quantity is absorbed by plant life, leaving 2,373,060,000,000 gallons, which either enters underground channels or visibly finds its way on the surface by creek or river.

Owing to the porous soil and flat character of the plains, about 75 per cent. disappears from view, while 25 per cent. remains visible, viz., 1,778,395,000,000 gallons in the earth and strata and 594,665,000,000 gallons in rivers and creeks.

At thirty gallons per head per day, rivers and creeks depending only upon the rainfall of the Province will maintain a population of about 54,000,000, while the underground water, if collected, will maintain a further population of 160,000,000.

Moose Jaw and south of Moose Jaw towards Milestone and Weyburn have been and are still considered dry districts.

The watershed drained by the Moose Jaw Creek and its tributaries includes about 8,400 square miles, and, with an annual rainfall of twelve inches, will provide 162,624,000,000 gallons of water.

Again, allowing a direct loss of about half the rainfall due to evaporation, there remains 81,312,000,000 gallons to account for.

Allowing two-thirds for plant life absorption, viz., 54,208,000,000, we have 27,114,000,000 gallons, which either finds its way underground or into the creek.

Assuming 75 per cent. to pass underground, the respective quantities are 20,335,000,000 and 6,778,500,000 gallons.

At thirty gallons per head per day the creek water, if conserved, will maintain a population of about 616,228; and the underground water, if collected, a population of 1,839,591.

The unfortunate part of the Western rainfall is that it is not spread evenly over the whole year. For months the creeks are dry, or almost dry; for occasional weeks they are in flood. The consequence is that great quantities of valuable water are wasted.

The whole solution of the water supply question is summed up in the word "**Conservation.**"

Huge dams must be built and large collecting areas formed, so that the freshet waters can be held back, providing supplies for dry periods.

The preservation of the purity of natural waters is another question, which the West is taking up seriously and practically.

The thirty gallons per head per day, or whatever the particular amount may be, is returned as sewage, mixed with all the waste and dirt of the community.

Communities are finding that it is necessary to remove the waste and dirt from the returned water before discharging it. Hence, we find cities like Regina, Saskatoon, Prince Albert, Moose Jaw and many of the towns contemplating up-to-date sewage purification works.

Plans for the purification of the Regina sewage have just been passed by the Provincial Bureau of Health. The scheme will include all the most up-to-date features. The system to be adopted includes:—

(a) Pumping the total sewage to a sufficient height above creek flood level.

(b) Removal of sewage solids by slow sedimentation tanks.

(c) Circular bacteriological filter beds, with revolving sprinklers, protected from frost and provided with artificial heat in winter.

(d) Final disinfection of the non-putrescible effluent by use of calcium hypochlorite in contact tanks.

(e) Stand-by tanks for storage of excess storm water.