

"The Bow River basin above the intake has during the summer season a population in excess of six thousand. In addition to this the travellers and crews of the Canadian Pacific Railway trains operated through the Bow River basin mean an additional population of approximately two thousand people.

"During the winter months the washings from the car lavatories are deposited along the river banks for many miles above the intake. With the opening of spring the rains wash this accumulated filth into the river, from which it is drawn directly into the supply mains of the city. The filth accumulations of the winter months amount to considerable, as during this time one hundred and fifty thousand people or more are carried through the Bow River basin on these trains.

"Pollution from such a source can well be looked upon as being of a greater danger than from a like population in a fixed location.

"The travelling public are from many localities, it amounts to a new chance each day, and can well be adjudged as more dangerous than a resident population."

From the above it would appear to be the wise course to favor the Elbow in preference to the Bow, for the future supply of Calgary.

**Consumption.**—The subject of past and future consumption has been given considerable thought. It is a regrettable fact that this city has not had any adequate meter or other measuring device from which the actual consumption could be ascertained. It has, however, been estimated that the total consumption in 1915 was in the neighborhood of  $10\frac{1}{2}$  million gallons per 24 hours, which for a population of 70,000 gives a per capita consumption of 150 gallons.

A tabulation of the average consumption as given by 19 meters in private houses, ranging from mansions, with large lawns, to the more modest house of the average consumer, shows that the average consumption is 57.02 gallons per capita. Another tabulation, giving Venturi meter readings for water delivered to the North Hill (the population on the North Hill, according to police census, is 14,787 people) shows an average consumption per capita of 150 gallons during most severe weather conditions when a number of taps most likely were running, and of 135 gallons during the summer time when lawn watering would be probable.

We have here two figures, *viz.*, 57.02 gallons at final point of delivery, and 135 gallons at point of intake, which the writer offers in support of the contention that a considerable loss takes place in transit, which can only be interpreted as "leaky mains."

Whatever the leakage may be, it is certainly a serious one, and should at the very earliest opportunity receive attention. The writer recommends that a waste detective survey be carried out in order to conserve the life of utility of the scheme with which this report deals.

The consumption for which this scheme has been designed is that of 100 gallons per capita, which should give a wide margin for public purposes, and for a reasonable amount of wastage. The city of Winnipeg has adopted this figure for its new water scheme. In his report on the Hetch-Hetchy water supply for San Francisco, John R. Freeman states:—

"The quantity of water actually used per capita is found to increase from year to year in substantially all growing cities in the United States, and is showing a similar although slower rate of increase in most European cities. This comes naturally with the higher standards of comfort, with more bath-tubs and more water fixtures in the dwellings, and in most American cities the rate of increase has far outrun the expectations of twenty years

ago. Even when a meter is installed on every tap, soon after the immediate drop, the curve of per capita consumption again begins to rise and, so soon as the water supply of a city is put on the rational basis of sale only by meter, there is no reason why the city should not encourage the most liberal use, particularly if it very properly adjusts its schedule of rates so as to make this a source of income which could be applied to the embellishment of the city.

"The writer, having had occasion to study this question of future per capita increase in relation to the water supplies of Boston, New York, Baltimore, and other cities, cannot regard it as prudent to estimate on a smaller supply for the San Francisco of, say, fifty years hence than from 125 to 150 gallons per capita per day, although by that time substantially every system is metered."

The proposed scheme has a life of utility of from 20 to 25 years, or even longer, depending on the energy with which the waste detection survey is carried out, under which conditions 100 gallons per capita may be said to be a reasonable allowance.

In referring to Fig. 1, showing population and consumption curves, it will be noticed that 13 million gallons, which is the capacity of the present pipe line from the new intake, intersects consumption curve at 100 gallons at year 1924, when it will be necessary to parallel the present pipe line.

From this year (1924) the whole of the proposed scheme is extremely flexible, inasmuch as the intake is designed to accommodate any size pipe within reason. Suppose we wish to accommodate population up to 1934, when it is 282,000, we see that 1934 intersects the 100-gallon curve at 28,200,000 gallons. Having already provided 13,000,000, our new pipe line must therefore have a capacity of 15,200,000 gallons. A similar reasoning can be adopted for any subsequent year.

**Hydrography of Elbow River.**—In referring to Fig. 2 it will be noticed that the average minimum discharge for the 5-year period (1910-1914) is 100 sec.-ft. with an absolute minimum of 62 sec.-ft.

The city has now a license pending the approval of right-of-way and plans for 25 sec.-ft., with an additional reservation of 50 sec.-ft. for future installation, and ultimately a further reservation for 25 sec.-ft. if requirements should demand it.

The total license is therefore equal to 100 sec.-ft., which equals 54,000,000 gallons per 24 hours, an amount which should prove sufficient for the city of Calgary up to 1950, without any impounding storage reservoir.

*(Continued in next week's issue.)*

A swifter and more comprehensive operation of an All-Red route in Canada after the war adds interest to the statement made at the meeting of the Liverpool Geographical Association regarding another All-Red route, which the events of the war have rendered possible, and which would bring Australia within fourteen days of London. When the Cape-to-Cairo Railway is completed it will be joined on to a railway system through Palestine already partly constructed by the Germans. Brindisi, the Italian port, will no longer be the terminus for the Australian line, but the new railway system will run down to the Aegean Sea, and the journey to Australia occupy fourteen days. There will also be direct lines from Petrograd to the Cape. Aleppo is likely to be the central city of these interesting developments in the eastern hemisphere. Though no aggressive military operations are yet reported from Mesopotamia, the British there are getting on with a railway from the Persian Gulf towards the north of Bagdad. Sir William Wilcox, the irrigation engineer, is planning to make Mesopotamia one of the finest wheat fields in the world, and Sir John Jackson has already built a barrage for diverting the waters of the Euphrates.