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STREAM MEASUREMENTS.

In *The Canadian Engineer* dated November 3rd, 1910, was published an abstract of a report presented by Mr. P. M. Sauder to the Dominion Government on stream measurements in Alberta, Sask. Mr. Sauder, as chief hydrographer to the Government, presented his second Progress Report on Stream Measurements recently, and this report has just been issued. The methods used on the work are of interest, and we here present an abstract.

Moosejaw District.—For some time it has been realized that as the country becomes more thickly populated and the towns spring up, there are portions of the West which will not have a sufficient water supply for domestic and industrial purposes. The Council and Board of Trade of Moosejaw for 1909, were among the first to realize that while there is a sufficient water supply in the district, it is allowed to run off into the larger rivers, in the freshets, and the district is left with an inadequate supply during the remainder of the year. They petitioned the Government to investigate and report on the resources of the Moosejaw Creek and the best methods for the development of same.

Two gauging stations were established on the creek; one at a bridge on the N.W. $\frac{1}{4}$ Sec. 16, Tp. 16, Rge. 26 W. 2 M.; and the other at a bridge on the road allowance between Secs. 14 and 15, Tp. 15, Rge. 25, W. 2nd Mer. Daily records were obtained at these stations, and the total annual run-off computed. A careful stadia survey was made of the valley from Moosejaw to a point a few miles above Rouleau, and a map showing the configuration of the surface of the ground by contours of 10-foot intervals, was prepared. While the topographic survey was in progress, a careful reconnaissance was made to discover the most inviting places for the location of dams and reservoirs. Cross-sections were taken at four dam sites offering the best opportunities for storage. The contour map shows the lands which would be flooded by the erection of a dam of any feasible height and tables showing the flooded areas and capacities of the reservoirs were also prepared. A report of this survey is given under the heading of Moosejaw Creek Drainage Basin.

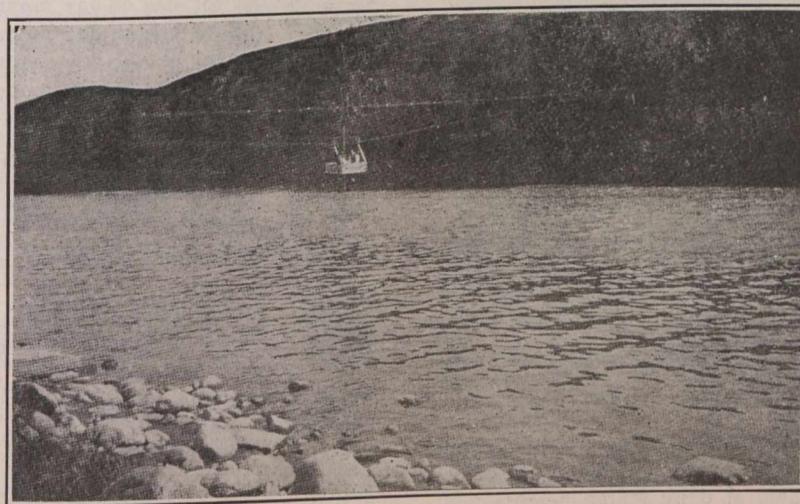
The water supply in the vicinity of Regina, Moosejaw, and along the Soo Line of the Canadian Pacific Railway is

limited and it is very important that we should continue a study of the regimen of flow of Moosejaw Creek for several years. This district will be extended during the coming year to include Souris, Qu'Appelle, and South Saskatchewan Rivers. Souris River, which heads in Canada, crosses the International boundary into the United States and then recrosses into Canada and finally empties into Assiniboine River east of Brandon. This river traverses a large territory in Canada and is the only stream in that district. It is proposed to divert it for irrigation purposes, in North Dakota, which may affect Canadian interests.

In all investigations of water resources the most important factor is the available supply. It is also the factor that requires the longest time to determine satisfactorily,

owing to the great fluctuations in stream flow from year to year. The stream gaugings already undertaken should, therefore, be continued for a number of years in order that the records may be long enough to show extremes of flow as well as a reliable mean.

The low flow of 1910 has demonstrated the part that municipal water supply and sewage disposal have in the use of rivers and therefore data should be compiled to show the amount of



Cable and Car on Elbow River, at Calgary, Alta.

such water supply and sewage and the source of the former (where in surface waters) and the disposal of the latter.

I do not think it necessary to elaborate on the importance of continuing observations during the winter on the more important streams. The minimum flow occurs during that season and should be determined for use in considering power schemes.

Next in importance to a knowledge of the available water supply is a knowledge of the fall of the streams, and the possibilities of storage. This is necessary to determine the value of the river for irrigation, water power, as an outlet for drainage ditches, and as an available channel for flood prevention work. River profile and reservoir site surveys should therefore be commenced as soon as possible on the more important streams of the West.

Definitions.—The volume of water flowing in a stream is known as run-off or discharge. In expressing it various units are used, depending upon the kind of work for which