

Power Sites in British Columbia

Physical Features of the Rivers—The Quesnel has Many Advantages

British Columbia is rich in water-powers. Most of the rivers are mountain streams, and consequently possess the advantages and disadvantages for power purposes that usually characterize such. Many of them, near their sources, are torrents subject to wide variation in flow. The generally rocky nature of the mountain river-beds renders the construction of dams a comparatively simple matter, but the wide variation in the stream flow makes either natural or artificial storage basins a necessity, in order to utilize to advantage, the potential energies of these rivers. As the hot sun of summer melts the glaciers and thus creates a heavier run off, many mountain streams are always at their maximum flow during the summer months.

Potentialities of Quesnel River

Keeping in mind these conditions, it is of interest to consider specifically some of the streams, the power-sites on which have been examined with a view to their possible development. One of these is the Quesnel river, a tributary of the Fraser. At its junction with the latter river, the Quesnel flows through a deeply cut channel. The river valley in general passes through a district composed of gravelly foot-hills, thinly timbered with birch, poplar and other small growth, the whole watershed having been swept by a forest fire years ago. The river is comparatively short for the volume of water it carries. It divides into two branches some seven miles from its sources; the north branch taking its rise in Cariboo lake, and the south, much the larger, in Quesnel lake. The total length of the river is approximately 70 miles. The South branch passes through two rocky cañons which present excellent opportunities for power development. The upper cañon is about an eight of a mile in length, and is at the foot of a series of rapids that reach almost to the lake, nearly three miles above. It is about 300 feet deep and has precipitous and rocky banks, making the construction of power development works comparatively easy. A thirty-foot dam combined with the present available head could give a total head of 150 feet.

Three miles lower down is a second and similar cañon. It is about one-quarter of a mile long, and its physical features correspond in general to the upper. A feature that makes the South branch of the Quesnel remarkable as a water-power project is the dam at the outlet of Quesnel lake. This dam was constructed for mining purposes at a cost, it has been stated, of \$400,000, and is of material assistance in improving the storage and regulation facilities of the lake.—G.H.F.

WATER-WORKS INEFFICIENCY

(Continued from page 1)

between these extremes.

In Saskatchewan, where the cost of delivery is higher than in any of the other provinces, the amount of water used is much less. In the city of Moose Jaw, for example, the daily consumption rate is only 15 gallons per head of population. All the water is metered and no flat rates are levied. The meter rates range from 10 cents to 25 cents per 100 cu. ft., somewhat below the average for the province. In the matter of meter rates however, there is an exceedingly wide variation in Saskatchewan. In one small town these rates range from 25 cents to 75 cents per 100 cu. ft.

Waste of Water

In eastern Canada the consumption rate is more uniform, but there are indications of considerable waste in many cities. Last year an Ontario city employed experts to ascertain the causes of waste. They found some serious leaks in mains, as well as wastage by individual users. The expert engineer in his report states that:

"Water is pumped at the present time at the rate of about 130 Imperial gallons per capita daily. At least three-fourths of this water is wasted without benefit to any one. Some of this wasted water no doubt escapes from leaks in the pipe system, but probably most of it escapes from leaky plumbing fixtures in the houses and shops of the city."

One hundred and ninety gallons of water weigh nearly one ton, so that this city is each and every day in the year, pumping four and half tons of water for each family of five persons. The average consumer may truthfully say that he is not using that amount of water, but he is PAYING for that amount and, if of the well-to-do class, probably for more than that amount.

And it is not unique in this respect. There are very few cities on the North American continent in which enormous water waste can not be found and this, despite the well-known fact that it is only necessary to install meters to put a stop to it. The Canadian who is really patriotic can not do better than consider carefully this question particularly as far as it affects his own municipality. It is axiomatic to water-works experts that, fifty gallons of water per head of population is ample and that—unless water is used for irrigation or similar purposes—all that is pumped over and above that amount is wasted.

A Modern Diogenes

The question of an efficient staff is, perhaps, the most vital problem that has to be handled at the present time—a staff that understands its business and is prepared to attend to it.—R. H. Campbell, Director of Forestry in Canada, in referring to the question of forest administration at the Fourth Annual Meeting of the Commission of Conservation.

Coal Mining in Nova Scotia

Advanced Method Followed—Department of Mines—Regulates Operations—Lower Benches of Old Mines being Developed

Conservation in the mining industry has been developed to a greater extent in Nova Scotia than elsewhere in Canada. In connection with the coal mining industry, in that province, the following is worthy of note:—

The coal lands are disposed of under a leasehold system, the period being twenty years, (except in special cases), with the option of three renewals, making in all eighty years. Under these conditions, there is little incentive to fevered haste to rob and ruin valuable coal-seams, and more care is exercised in gaining a thorough knowledge of the conditions of its occurrence, that the method best adapted to its extraction may be determined. The long period lease also gives confidence to capital and permits larger outlays to be made, in order to prevent as little waste as possible in the mining and utilization of the coal.

Government Approval Necessary

The method of mining to be adopted in the different districts is generally understood and, before a mine can be developed, or a new section of a mine opened up, it is necessary that the plans be submitted to, and meet with the approval of the Department of Mines. In addition to this, the Government requires all operators to make yearly returns showing the extraction obtained, etc. The information thus obtained is not only of value in determining the rate of exhaustion of the coal-fields, but also allows a comparison of the methods and thus tends to standardize the methods employed.

As a result of the systematic manner in which mining is carried on in Nova Scotia, large sections of coal have been mined with but very little loss.

With regard to the order in which coal seams are worked it is the practice generally to mine the highest workable seams first and to leave large pillars in advance work to support the weight of the superimposed strata. Where superimposed seams are worked contemporaneously the work in the upper seam is kept well in advance of the lower and pillars are never drawn in the lower seam until all the pillars in that section of the upper seam are removed and the roof has been allowed to settle.

Precautions in Submarine Mines

Submarine mining is carried on to a considerable extent in Cape Breton and, with the exception of the flooding of the mine at Port Hood, no accidents have occurred and no coal has been lost. Generally speaking, few submarine pillars have yet been extracted but the pillars left are of such dimensions that it will be possible, where sufficient cover exists, to recover

these pillars in retreat after the boundaries of the mines have been reached. Where seams of usable size and quality extend seaward beyond the limits of a submarine property, drawing the pillars should be forbidden. If the company's lease does not provide that the pillars be left in place, compensation for the pillar coal should be made.

In the Pietou coal-field the conditions are not so favourable for the high extraction of coal as those met with in Cape Breton coal areas. This is due to the thickness of some of the coal seams being such as to make it impossible to mine all the seam at one lift; also the high dip of the seams quickly increases the depth of cover over the workings, and as the workings extend to the dip, timbering, haulage, pumping and ventilation problems are made more difficult. To that above, may be added the fact that some of the seams are liable to fires due to spontaneous combustion; also, the top bench of the coal seams in several of the mines has been removed a number of years ago.

Notwithstanding the above mentioned disadvantages, the top coal and the bottom coal which had been previously left in the mine is now being recovered so far as is economically possible.—W.J.D.

NOTE.—This article will be followed by articles on "The Economic Use of Coal in Nova Scotia," and "The Utilization of By-Products in the Iron and Steel Industry."

Housing Pointers

You must not forget that some of the problems which confront you are not to be permanently solved; the city is ever on the move. The garden suburb of to-day is the manufacturing district of tomorrow. So you must look to it that your improvements keep pace with the growth of the city and at times even show an intelligent anticipation of such growth.

Furthermore, it is not sufficient to provide suitable and sanitary buildings. Many thousands of the working classes are far from grateful for being put into them. This phenomenon has repeatedly evinced itself in other great cities. You have not only to provide improved conditions of housing, but you have to educate the working classes to such an extent that they will insist on living in a decent and sanitary manner.—Duke of Connaught, before First Canadian Housing and Town Planning Congress.

So Much for Appearances

Popular taste is by no means a correct guide to the food qualities of fish. Thus, for example, practically no market can be found for the British Columbia white-fleshed salmon, in spite of the fact that they have a superior flavour to the pink-coloured species. Large numbers of these fish are thrown back in the streams, or are given to the Indians by the fishermen because no market is available for them.