

Canada has still large natural resources, and it is but proper that those which are still public domains should be under government control, the country at large having still a right to receive what benefits there may be in their developments.

### EDITORIAL NOTE.

Returns from Interstate Commerce Commission of the United States show that for the three months, April, May and June, 1910, there were 137 killed and 2,741 injured in train accidents on United States roads. It shows the number of casualties for the year to be 3,804 killed and 82,374 injured. For the same period a year ago there were 2,971 killed and 63,920 injured, which shows an increase of 1,013 in the number killed and 18,454 in the number injured. There were 5,861 collisions during the year ending June 30th, 1910, causing the deaths of 433 persons and injuring 7,765 persons, with a damage to the property of the railroad companies of \$4,629,279, being an increase of 1,140 in the number of collisions, with an increase of 91 in the number of persons killed, and an increase of 2,370 in the number of persons injured. There were 5,910 derailments during the year ending June 30th, 1910, an increase of 659. There were 340 persons killed in derailments and 4,814 injured, an increase of 79 in the number killed and 673 in the number injured.

### FACTORS TO BE CONSIDERED IN VALUING A WATER POWER.

In making the total valuation of the property of a large manufacturing concern recently, Lockwood, Greene & Co. of Boston, Mass., the architects and engineers for industrial plants, had occasion to determine the "Value" of the water power developments belonging to this company.

The method pursued in arriving at the final value contains matter of much interest and the factors considered are those which in a general way would enter into the valuation of any water power. Before entering into a discussion of the five principal factors considered it may be well to quote the general remarks at the beginning of the report. These are as follows:

"In the endeavor to affix the proper value to these properties, it is evident that more must be considered than the actual cost of the land and improvements. Some sites can be more economically developed than others, some rivers are more regular in their flow of water, are less subject to ice or silt, or are in a locality where coal is dear and transportation expensive. The value of a water power depends largely upon these factors and they have been considered in arriving at the prices named."

After these opening remarks, Lockwood, Greene & Co. proceed to enumerate the five principal factors to be considered in the valuing of a water power. These are as follows:

(1) "Regularity of flow of the river and average quantity of power delivered.

(2) "Cost of steam power in the vicinity, based on costs of bituminous coal of fair steaming quality.

(3) "Advantage to the company in possessing a supply of power only slightly affected by actions of other corporations or human agencies.

(4) "Liability to stoppage from

(a) Low water.

(b) Ice.

(c) Electrical or storm disturbances.

(5) "Future advantages owing to probable increase in price of coal and enhancement of water power generally, including increased efficiency or electrical application of energy."

Regarding Factor No. 1, there are three conditions under each one of which the effect of the regularity of the flow will be different. These conditions are: First, when the minimum flow is sufficient to supply all the power required; second, when the minimum flow is not sufficient to furnish all the power required, but the average flow is sufficient for this purpose; and third, when the average flow is insufficient to furnish all the power required.

Under conditions 2 and 3 it is necessary to have some auxiliary power, the installation of which has an effect on the total valuation of the water power in proportion to the amount of water power utilized from the development. For example, in the particular case being investigated, the power requirement of the company was greater than the average power of the water power development, and there was a steam plant with power sufficient to meet the deficiency in the water power output. Hence all the water power up to the capacity of the plants can be used, and the computations of the value were based on the average output without considering the primary and secondary power output.

Regarding factor No. 2, two items enter into this consideration. First, the cost of the steam plant complete, and second, the cost of its operation. In determining the cost of a steam plant complete, this should be taken for a plant most advantageously located and designed to operate at a minimum cost. The power developed in a steam plant should be taken as the brake horse power from the engine wheel shaft, and the size of the engine should be fixed after making due allowance for engine losses and mechanical efficiency. Another consideration in connection with a steam plant, is the possibility of operating it under a big overload, should necessity require, an attribute not held by a water power.

Factor No. 3 is a most important consideration, as a manufacturer can be greatly inconvenienced, or his business even be jeopardized, by having his power plant disabled on account of transportation troubles, strikes in coal mines, or other human or physical agencies.

In regard to factor No. 4, the so-called physical or natural agencies are considered. A careful study of the three items enumerated should be made for each local condition.

In factor No. 5 the future is considered, and it is undoubtedly true that the value of water power will be enhanced as the supply of coal decreases, this enhancement increasing up to the point where a value is determined through the law of supply and demand. The consideration of increasing the efficiency of electrical application and transmission of energy is of more immediate interest. This is especially true in regard to transmission, as great strides have been made within the past few years in the economical distribution of electrical energy over wide areas. The natural result is, of course, the increasing of the market for the output of any particular hydro-electric development and the consequent enhancement of its value.

Summarizing, it will be seen that Lockwood, Greene & Co. have in reality considered the fundamental factors in the value of a water power to be amount and condition of the water supply; the cost of producing an equivalent amount of power by other agencies; the effect of human and physical agencies, and last, the future possibilities.