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PULP AND PAPER INDUSTRY IS BOUND UP WITH ELECTRICITY; WATER POWER IS ESSENTIAL

(Financial Post.)

It has been said that it is not the forests which are bringing the pulp and paper industry to Canada, but abundant supply of power which in most cases is capable of development in close proximity to possible mill sites.

In a measure this is true—and with the rapid depletion of pulpwood supplies in the United States, Canada is being more and more depended upon to supply the demand for paper. With the constantly mounting cost of producing power from fuel, it is apparent that power for the industry must continue to be obtained in ever-growing proportions from water, and Canada is particularly favored in having her water powers widely distributed among her ample forests. As the consumption of pulpwood is rapidly increasing, it is apparent that settlements and water power developments will extend steadily northward. With the growth of population and the necessity of the pulpwood supplies, other uses for the power left available will be found and new developments completed farther north. Pulpwood and water powers are the chief factors in connection with the future expansion of our north country. While true conservation of water power depends upon its fullest development, continuity of supply depends upon the maintenance of suitable forest cover on the water-sheds—this again emphasizes the necessity of adequate forest protection in the shape of protection against fire, pests and disease and also protection against improper cutting.

Many Power Projects.

All this is amply evidenced in the two most recent power developments in this country, namely those of the International Paper Company.

This one company has recently incorporated two wholly owned subsidiary power companies in this country, namely the Saint John River Power Company, and the Gattineau Power Company. The former is to develop some 60,000 h. p. on the Saint John River and the power which is so developed will be used to operate two new newsprint mills in New Brunswick, one of the International Paper's and the other of the Fraser Companies. This development will be completed by midsummer 1928.

The new power plants on the Gattineau river are to be completed soon. The first development of over 200,000 h. p. will have its turbines operating by 1927 and because of its magnitude and the fact that it was started primarily to supply the International Paper Company's new Gattineau newsprint mill with power, the whole project is well worthy of review in any series of articles which endeavors to present anything like a comprehensive review of the pulp and paper situation as it exists in the Dominion today.

Two New Plants First.

The Gattineau Power Company, early in 1927, will have available at Chelsea 131,000 horsepower and 92,500 horsepower at Farmers Rapids. The production of both plants will be capable of being increased by 25 per cent. simply by the addition of one new generating unit in each plant. Both these sites are practically next door to the city of Hull.

Before the end of this year, construction work will begin on another development at Pagan Falls; this plant will be in operation before the end of 1928 and will produce a further 150,000 horsepower which is presently being generated at the company's Kipawa plant, will make a grand total of 397,500 horsepower before the end of 1928, which will be available from the company's projects.

Perhaps a Greater Output.

But this is not all, for the Gattineau Power Company has long term leases upon water power sites with a total potential capacity in excess of 700,000 horsepower; possibly, before the initial development of 397,500 horsepower is completed, the company will undertake even further developments which cannot fail to bring prosperity to the valleys of the Ottawa and Gattineau rivers. The strategic centres of these two rivers are, of course, the cities of Hull and Ottawa. To them will accrue, of course, much of the benefits of the immense projects.

In order to obtain a better picture of the magnitude of the Gattineau power developments, it is necessary to compare the initial output of the new company, 397,500 horsepower, with the total amount of horsepower installed, controlled or purchased by the Shawinigan Water and Power Company, the largest privately owned power company in Canada and one of the largest in the world. In all, Shawinigan sells

550,800 horsepower. So that, it can be seen that the developments now taking place in and around Hull are comparable in magnitude to any hydro-electric developments anywhere.

Cost of Developments.

Probably the cost of the projects now being erected will run to around \$50,000,000—but the grand total will be far in excess of this figure.

The new Chelsea power plant is located some seven miles, and the Farmers Rapids some six miles, north of Hull. The Pagan Falls project is about 20 miles further up the Gattineau river. The latter joins the Ottawa just below Hull.

There is an interesting feature in connection with the development of which little has been written. This is the erection of a storage reservoir at Bitobe, about 116 miles north of Chelsea. Here, to provide against low water periods or dry seasons when the flow of the water is greatly curtailed, the Gattineau Power Company is erecting a storage dam. A lake will be created with a water surface of some 64,000 acres; it will contain more than 82,000,000 cubic feet of water. This work is being carried out under the direction of the Quebec Streams Commission.

The drainage area above the dam is about 6,200 square miles and thus, during the spring freshet seasons, the water will be retained; during periods of low water, it will be released to provide a minimum regulated flow of lower river waters of 8,000 to 10,000 cubic feet per second.

Benefits to Accrue.

How vital and how useful is this work may be judged from the fact that the new regulated flow of the river will be about three times that of the normal low water flow. Thus the power plants will be enabled to turn out a steady stream of energy which will neither vary from month to month nor with the periodic changes in the level of the waters of the river.

At Chelsea, the new dam will give a head of 93 feet of water; at Farmers, the dam will provide a head of 68 feet.

The Gattineau Power Company's contract with the Hydro Electric Power Commission of Ontario, which alone will take over 70 per cent. of the available primary power, covers a period of 30 years. The commission will purchase 80,000 horsepower during the 12 months beginning October 1, 1928, the amount increasing annually thereafter until a maximum of 260,000 horsepower during the 12 months beginning October, 1931, is reached; the latter rate is maintained throughout the life of the contract.

The Canadian International Paper Company has also contracted to purchase a minimum of 74,000 horsepower for 30 years to be used at the new Gattineau newsprint mill and the Kipawa Pulp Mill.

The plan accompanying this article shows how the Chelsea and Farmers Rapids developments will be carried out.

A Close Association.

All this is simply evidence of how closely linked up with the pulp and paper industry is the hydro electric development in the Dominion. The reason for the close association between the two industries lies in the fact that it takes practically 100 horsepower to make one ton of paper per day. Thus the indispensability of an abundant supply of low-priced power at once becomes apparent. In any industry, the relative necessity of obtaining cheap and adequate power may be gauged by the amount required per dollar value of the products and, with the possible exception of certain electro chemical and metallurgical processes, the requirements for the manufacture of pulp and paper rank among the highest. It is, therefore, little surprise that over 90 per cent. of the motive power in this industry is derived from the energy of abundant and advantageously located waterfalls.

How the Power is Used.

It might be of interest to ascertain just how this 100 horsepower per ton of wood per day is spread over the manufacturing of pulpwood into paper. One well-known Canadian mill uses on an average about 73 horsepower for each ton of mechanical pulp produced, 67 horsepower of which is for the production of grinding alone. The production of sulphite pulp for mixing with groundwood requires between 8 and 9 horsepower per ton of daily output—in some other mills as high as 20 horsepower is used per ton of sulphite pulp produced—while the conversion of the pulp into newsprint requires about 12 horsepower for the same unit of current.

As the mills in this industry usually operate a twenty-four hour day, it

will be seen that because of the high load factor—this means no time of peak or off-peak power—the power is secured as a rule at a very low cost. This is due to the fact that the capital expended in hydro-electric development remains constant, whether the plant operates ten hours per day or twenty-four. Because the companies can obtain such a low rate for power when there is a continuous load, this has resulted in many of them utilizing their off-peak power in the production of steam for pulp cooking, drying, heating and similar uses.

Power Installation.

Because of the rapidly increasing importance of the pulp and paper industry in the development of commerce and the settlement of the country and the part which this industry plays in the water power resources of the Dominion, the Dominion Water Power Branch of the Department of the Interior, Ottawa, has conducted special studies in this connection and has gathered much information on power installation and requirements of pulp and paper mills operated by water power or by purchased hydro-electric energy. This government department says that, due to the elasticity of electric power, those mills which in the past have used hydraulic power are rapidly changing over to the use of the former energy. The advantage of this conversion to electricity appears both in the quality of the product, which is improved by the uniform speed attained, and in the fact that under modern methods of transmission it is possible to develop power at one or more sites more or less remote from centres of labor and transportation and to transmit it to points where these commodities are available for mill operation and for providing supplies of raw material and conveying the finished product to the market. The best modern practice of pulp mill construction provides for the development of the mill and power sites as separate projects, that is, the site of the mill is selected from the point of view of operation and transportation, whilst the power station or stations will be placed probably in positions unfavorable to mill construction. The use of steam as a source of power in this industry is limited and in many cases is prompted by special conditions, such as operation in close connection with the manufacture of lumber, when the refuse from the latter may be used as fuel for the boilers. The steam power installation in pulp and paper mills is less than 10 per cent. of the total installation in the Dominion.

Further evidence of the intermingling of the power and paper industry is seen in such companies as Laurentide and Abitibi. The former controls the Laurentide Power Company with its large development at Grandmere, P. Q., whilst the latter develops for its own use well over 100,000 h.p. in all. Then, too, there is Price Brothers, with its interest in the Duke-Price Power Company and the large group of newsprint producers in the valley of the St. Maurice river where they located for the one reason that there was an ample supply of power ready to meet their demands.

THE OCTOBER ROD AND GUN

Many features dealing with all kinds of outdoor sport combine to make a very attractive magazine of the October issue of Rod and Gun the publication of which falls in line with the opening of the fall hunting season in Canada.

A novel means of pursuing game is dealt with by Raymond Thompson in an article "Hunting and Fishing via Scow." The country is the vicinity of the Athabasca River in Alberta. The interior of British Columbia is the scene of "Three Fishers Went Trailing" by Robert Watson. A timely article by an old timer in an article on methods of duck shooting by Frank J. Parsons, which contains a number of good wrinkles. A Bryan Williams concludes his good series of articles "Breezes from the West" in this issue, while a useful series of articles on first aid in the bush by A. G. Shakespeare commences.

Another of Frise's inimitable cartoons is one of the special features of the issue and a special article covering the D. C. R. A. matches at Ottawa, also appears in the October number.

Rod and Gun is published monthly by W. J. Taylor, Limited, Woodstock, Ontario.

"SPOTLESS TOWN"

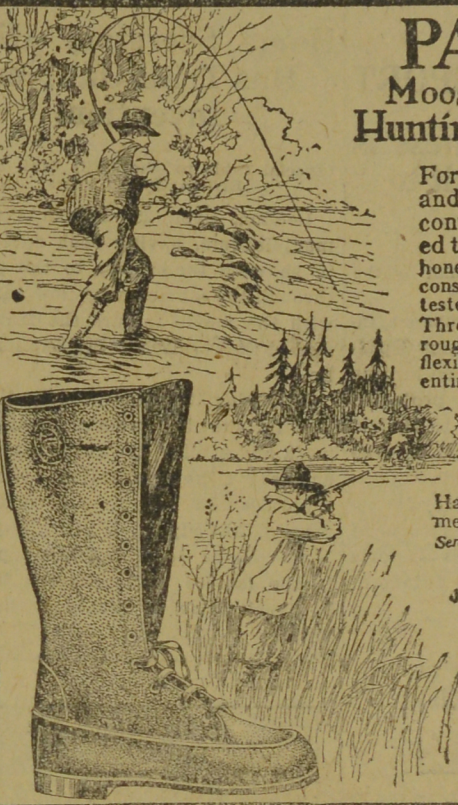
Ashbury Park, N. J.—This spotless town, which recently forced motorists to pick up rubbish they had strewn on the streets is going to do the same with an aviator if he can be found. He dropped advertising leaflets from a height of 1,000 feet.

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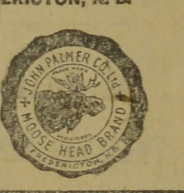
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