

with the exception of the runner of the hydraulic turbine. It is said that the runner functioned for only a very short time, when it jammed at full gate opening. Upon examination it was found that the runner had developed a crack from the shaft both ways to the vanes. Fortunately a spare runner had arrived the same day and is now being installed, so it is expected that power will soon be available.

By the end of this month the barking house will be able to handle logs and to prepare a stock for storage at the piling ground. Work is being carried on day and night on some portions of the undertaking, in an effort to produce pulp before December 1st, 1919.

Future extensions to the main mill buildings will be facilitated by the fact that the wall at one end of each structure is merely a wooden curtain wall.

#### Personnel

The consulting engineer for the Kipawa Co., Ltd., is Hardy S. Ferguson, of New York City, who is represented on the ground by B. T. Weston. C. B. Thorne, chief engineer and technical manager of manufacture of the Riordan Pulp and Paper Co., Ltd., is in active control of the work at Timiskaming. W. L. Ketchen is resident engineer and local manager, with F. O. White as his chief assistant.

Allan K. Grimmer is town engineer. The G. A. Fuller Co., of Montreal, are the chief contractors, constructing the mill, with the exception of the acid towers and acid tanks, power house and dam. The Dickie Construction Co., of Toronto, are erecting the houses. McAuslan & Anderson, of North Bay, Ont., are contractors for the sewers and water mains, tracks in the piling ground, outside piping in mill yard, superstructure of bridge crossing Gordon creek, and screen house on 4-ft. pipe line. The Sherwood Construction Co., of Toronto, are constructing the tracks leading to the coal and sulphur storage, which involves considerable rock cut and fill, and also installing the fire protection in the piling ground. Among the other contractors are the Stebbins Engineering Co., Philadelphia, acid towers; Danforth Co., Buffalo, inside piping; Dominion Bridge Co., Montreal, combined railway and highway bridge crossing Gordon creek, and the coal and the chip conveyors; Pacific Coast Pipe Co., Vancouver, both of the wood-stave pipe lines; Rensselaer Valve Co., Troy, N.Y., and Chapman Valve Mfg. Co., Indian Orchard, Mass., gate valves and sluice gates; I. P. Morris Co., Philadelphia, hydraulic turbine; Canadian General Electric Co., Toronto, and Canadian Westinghouse Co., Hamilton, electrical equipment; Herbert Morris Crane & Hoist Co., Niagara Falls, Ont., crane for power house and chain hoists.

## Undeveloped Water Powers of New Brunswick

List of Possible Sites Totals 23,000 H.P. (24-Hour Power), Not Including the Grand Falls of the St. John and Nepisquit Rivers—Paper Read Last Week at the Engineering Institute's Fifth Professional Meeting

By C. O. FOSS, M.E.I.C.

Chairman, New Brunswick Water Powers Commission

**L**AWS governing hydrostatics and hydraulics are so simple that the way-faring may readily understand them, yet I think I may safely say that there are no other natural laws so little understood even by people of high intelligence. There is no engine of equal power which is so simple of construction and installation, so uniformly sure in action, and subject to so little wear and tear and depreciation, as the modern up-to-date hydro-turbine. I need not say that there is nothing miraculous about water power; and that in a comparison of water with other methods of power generation, we may easily make the mistake of spending so much money in the purchase, development and transmission of hydraulic power that the output may cost more than power generated in some other way, especially when the consumption is small and limited. However, these exceptions only serve to prove the very general rule that hydro power is cheaper, surer and more flexible than any other form of power that can be developed in considerable units.

As regards water power possibilities in New Brunswick, it has been considered by the people generally that there are no power possibilities of any value outside of the Grand Falls of the St. John, and a very moderate possibility at the Grand Falls of the Nepisquit, and this opinion has been strengthened by statements to that effect by parties who are supposed to be authorities upon the subject.

#### Grand Falls Too Remote

If this were true, the distribution of hydro-electric power in centres of population would be well nigh hopeless, for the cost of developing the Grand Falls of the St. John would be so great, and its location is so remote from the centres of population, with the market at present in sight so limited, that the interest and overhead would make the cost greater than power generated by other methods.

To make these powers commercially possible of development and use, the output must be used at or near the site in the manufacture of pulp and paper, the logical large industry for this province. In the case of the Nepisquit power, the Bathurst Lumber Co. are having plans prepared for the development and transmission to their pulp and saw mills

in Bathurst, and the big power at the Grand Falls of the St. John will be developed in the near future for the same purpose. The parties now controlling the latter power site have a year from the close of the war to start the development, failing which the provincial authorities will take away the control and arrange for the development by other parties.

Then, having disposed of the large power possibilities at the two grand falls, the question naturally occurs: "Where is power to be found for distribution and use in the centres of population?"

#### For Distribution to Municipalities

The centres of population requiring, and not at present supplied with, hydro-electric power, are three:—

First, Fredericton and vicinity; second, St. John and vicinity; third, the towns on the north shore from Chatham to Campbellton.

Moncton and vicinity has cheap power generated from natural gas.

St. Stephen has hydro-electric from the St. Croix.

Edmundston has a municipal plant on Green river. The Frasers have a development on the Madawaska for use in the pulp mill they have lately constructed. The capacity of this site may be considerably increased by storage on the Temiscouata, and they will be able to get any additional power they may need, when they enlarge their plant, from Grand Falls when that is developed.

Woodstock also has a good hydro plant.

Taking the requirement of Fredericton:—

There are two streams falling into the St. John north of Fredericton, the Pokiok and Shogomoc, 37 and 40 miles, respectively, following the highway which parallels the river, and 30 and 33 miles in an air line.

These streams each drain about 50,000 acres. The Shogomoc falls 300 ft. in the last two miles, and the Pokiok falls 200 ft. in 1½ miles and 100 ft. more in about 500 ft.

Both these streams have excellent opportunities for storage, as they drain a country which is comparatively flat to a point about 2 miles from the St. John river. In other