

BUCYRUS EATS TONS OF EARTH

World's Largest Shovel at
Work on Chippawa Power
Scheme

CANAL 12½ MILES LONG

Complete Hydro Development
Work in 1921—Will Fur-
nish 300,000 H.P.

(Staff Correspondence of The Globe.)

Queenston, May 26.—Bucyrus, like a mighty beast, devours all before him. Of steel-greyish color, monstrous and powerful, he is to be found only in Canada. Bucyrus is known in no other part of the world. His haunts are the Niagara Peninsula. There he is to be found any working day of the year, going steadily about his chosen work of gnawing into the earth's surface. His appetite is never appeased. Every day is alike to him, and he will devour 800 tons between sunrise and sunset.

This gigantic monster Bucyrus is the largest shovel in the world. He is the property of the Hydro-electric Power Commission of Ontario, and his duty is to bite huge chunks out of the earth in connection with the \$20,000,000 Chippawa-Queenston power development. Every time he takes a bite he lifts 10 tons of earth.

Working Near Fore Bay.

Bucyrus is being used on the canal which is being built between Fore Bay, one mile above Queenston, and Chippawa, as part of the development scheme. He is to be found at work about 2½ miles from Fore Bay. He does not require the ordinary wild-beast tamer to manage him, but two experienced men, a cranesman and a shovel runner, are required to keep him on the job. He responds to every action of the operator like a horse does to the rein. The cranesman and the shovel runner are in a shed several feet below. As one lever is pressed the gigantic steel arm is lowered, and by a reversal of the lever it gradually raises. At the same time the half-a-dozen heavy teeth go into the embankment of earth or rock, whichever it may be, and by the time the dipper reaches the top it is full. Another lever is shifted and the dipper swings upward and over and dumps the earth into waiting cars, in which it is hauled away.

Bucyrus has one brother, who is doing similar work about a quarter of a mile farther along the canal. Both of them were built in Milwaukee at a cost of \$100,000 each.

They were placed in operation last January. Since then they have proven such a success that a third one has been ordered, and delivery is expected soon. Every 45 seconds the huge arm swings up and down and each time the dipper rises it lifts ten tons of earth, which in a ten-hour day amounts to 800 tons. The maximum lift is 70 feet from the level of the canal.

Smaller Shovels, Too.

Both of these steam shovels, which are the largest ever built, are operated by electricity. Being an electrical development scheme, it is only proper that all of the work possible should be done by electricity. In addition to the two big shovels, there are two of medium size and two smaller ones. Then, too, there are two small steam shovels at work on different parts of the canal.

This scheme, which has been undertaken by the Hydro-electric Power Commission, is the greatest electrical development work ever known in the world. No wonder, therefore, that some of the machinery should be the largest in the world. Active work on the carrying out of the plans was begun about a year ago, although engineers had been employed for three or four years before surveying, taking measurements, taking gauge readings of the Niagara River and generally securing all information that was necessary before development could be undertaken.

Completed Scheme in 1921.

The work went on all last winter and it is hoped that by the fall of 1920 part of the plant will be in operation, and that the scheme will be completed early the following year. When completed the plant will develop 300,000 horse-power, which will go a long way toward meeting the ever-growing demand for electrical energy.

The Chippawa-Queenston development is recognized as a war work. This is natural in view of the tens of thousands of horse-power being furnished for munitions and other industries manufacturing army supplies. It is only as a war work that it is allowed to proceed. Great difficulty is experienced in securing delivery of materials. However, the Dominion authorities issued priority orders to the Commission and in that way materials are secured several months earlier than they could be if the work was non-essential.

One Thousand Men Employed.

Work on the development operations is divided into two big camps. One thousand men are employed between the two places. This number will be slightly increased during the summer as the work proceeds. No difficulty is being experienced in securing laborers this season, although skilled help is none too plentiful. This is an improvement in conditions over last year. Foreigners are being used largely for the ordinary work, being paid 35 cents an hour. The men in charge of construction do not knowingly employ **allens of enemy** birth. However, they state that it is hard to be sure of men, as those who formerly called themselves Austrians may now say they are Galicians or some other southern European or

Asiatic race. True, if these men were so inclined they could do some damage to delay construction. Every precaution is taken, however, by the officials, and the explosives used are entrusted only to men who are reliable. The pay sheet averages about \$50,000 a month.

The scheme, roughly speaking, is composed of a canal from Chippawa to Fore Bay, and a power house situated at Fore Bay on the water's edge. Construction has not yet commenced on the power house, although the site has been cleared of trees, and excavation will be under way this summer.

Cut Through Solid Rock.

The canal will have to be excavated for 8½ miles from Fore Bay to Montrose. At Montrose it will be linked up with the Welland River, which is four miles long. The average maximum depth of the canal when completed will be between 35 and 40 feet. It will be 200 feet wide where the excavation is made in earth and 48 feet wide where the canal has to be put through rock. Seven of the 12½ miles of the canal will have to be through rock. The estimated cost of putting the cut through earth is 30 cents a yard and through rock slightly over \$1 a yard.

The construction camps are complete in themselves. The portion of the excavation being done two and a half miles from Fore Bay is known as the Whirlpool gorge work. Here is situated a large machine shop and planing mill, where the lumber required is dressed as needed.

Labor-saving Devices.

It was because the Commission realized the possible shortage of labor for many years that such costly construction plant was purchased. Every device that can possibly save manual labor has been placed in operation. It is said that the gigantic steam shovels will save their purchase price in one year, even although they cost \$100,000 each. A large army of men would be required to do the excavation work that is being done by these shovels.

A further idea of the immensity of the scheme can be secured when it is known that between 40 and 45 miles of construction railway are being put down, half of this amount now being in operation. Twelve electric locomotives are at work hauling construction trains, while eight steam engines are engaged in the same work.

A compressor plant is situated in this camp, too. Here the power is generated for the railway, and the air is compressed to operate the shovels. The plant has a capacity of 6,000 horse-power at present, and this is being increased to 8,000 horse-power.

Operations have only been in progress a few weeks on the excavation work in the Welland River. This watercourse has to be deepened. A large cable way excavator has just recently been placed in position. On either side of the river are railway tracks. A tower is erected on each track, and cables are stretched across the river from one tower to the other. Along this cable the excavator travels back and forth. The dipper which is used lifts from two to four yards of earth out of the bottom of the river each time, and

runs along the cable and empties it on the bank.

No Longer an Experiment.

All of the work is done by the Hydro Commission itself. None of it is sub-let to contractors. Mr. H. G. Acres is the engineer who has charge of this gigantic operation. He has been with the Hydro for a number of years, and this job is only another of the big schemes he has set out to carry out for this publicly-owned power system, which is operated by a *Government Commission*, of which the Chairman is Sir Adam Beck. As Mr. Acres showed a representative of The Globe over the work he emphasized the fact that, while it is the largest development of electrical power ever attempted in the world, it is not an experiment. Smaller plans for similar work have been carried out before. While it is hoped to have the plant in partial operation by the fall of 1920, that is a pre-war estimate. However, with the assistance of Government priority orders, it is believed the work will be completed on schedule.

While the Hydro is engaged on this big plant, it is also busy extending the plant of the Ontario Power Company to increase its capacity by 50,000 horsepower.