HARBOR IMPROVEMENTS AT ST. JOHN'S, N.B.

St. John's activity during the last year is due chiefly to the enormous expenditures being made on harbor works, but there is also an increase in the number of factories. The Norton Griffiths Dredging Company are bringing in a fleet of powerful dredges to work in Courtenay Bay, and there are already five dredges and a stone lifter at work in the western harbor and the channel. The Norton Griffiths Company are steadily enlarging their mammoth plant at the site of the breakwater and dry dock in Courtenay Bay, and work will be continued throughout the winter. At West St. John work has been begun on the foundation of the Canadian Pacific Railway grain elevator, and this work will be steadily continued throughout the winter, as well as also the work of constructing new wharves at that point.

The Canadian Pacific Railway finds it necessary to erect a large addition to its office building at West St. John. It has also asked the city for a considerable strip of land at Fairville for an extension of its railway yards. The Intercolonial Railway is adding to its yard capacity storage room for 300 additional cars. The street railway company will extend its line in the direction of East St. John and its electric light system the whole way

Interesting developments are taking place at Coldbrook, three miles out on the line of the Intercolonial Railway. Formerly there were extensive rolling mills at this point, and it was quite an industrial centre, but of late years industry there had ceased. The Maritime Motor Car Company is building an automobile factory to be ready by February 1st, and has discovered on its property a deposit of fine brick clay and a brick-making establishment will be added. The Coldbrook Realty and Development Company, which has planned a garden suburb there, will erect before spring several cottages for workpeople.

USE OF PEAT IN GAS PRODUCERS.

On account of the lack of suitable coal deposits in the central Provinces of Canada and the rapidly decreasing supply of wood, the Canadian Government has taken an active interest in the exploitation of peat bogs with the view of developing from these deposits a fuel supply independent of outside sources.

Not only has the use of peat as fuel been considered, but the question of its utilization for producer gas has also received attention. A producer has been installed at the Fuel-testing Station, Ottawa, and exhaustive investigations have been conducted to determine the suitability of peat for this purpose. It is stated that very gratifying results have been obtained.

Mr. B. F. Haanel, chief engineer of the Division of Fuels and Fuel-testing of the Department of Mines, Canada, who discussed these results in a paper presented before the Eighth International Congress of Applied Chemistry, explains that the process used in manufacturing peat fuel mechanically treats the raw peat and utilizes the sun's heat for drying.

The raw peat is fed into a pulping mill consisting of a series of revolving knives rotating against fixed knives. By this treatment a homogeneous mass is secured, and by breaking the cell walls the contained moisture evaporates more easily. After thorough pulping the peat is taken to the drying field, spread out, cut into blocks of suitable size and thoroughly dried. The moisture content is reduced by this process to 25 or 30 per cent., below which it is not considered economical to proceed.

On account of the hand labor involved the estimated cost of one ton of peat fuel is about $2, including interest on capital invested and a profit of 15 cents per ton. To put the industry on a paying basis it is recommended that the excavation and spreading should be performed automatically and on a large scale. A plant is now being installed to meet these requirements.

On account of the low heating value of peat fuel it is not considered suitable for steam raising, though well adapted for producer gas production.

The high percentage of nitrogen in Canadian peat thus far examined peculiarly adapts it for plants designed for ammonia recovery. The nitrogen in the peat is recovered as ammonia sulphate, for which there is a large demand in the fertilizer industry.

However, the common type of producer employed for peat is not constructed for the recovery of by-products, but rather to burn the fuel with the highest possible thermal efficiency. The Körting producer erected at the Fuel-testing Station, Ottawa, is of this type, and is designed not only to obtain the complete gasification of all the combustible components in the peat, but to destroy rather than recover any of the by-products.

It was found necessary to modify the type of producer in some details before economic results were obtained but without going into details the investigation, in the opinion of Mr. Haanel, has proved that the peats tested are an economic source of power.

THE EFFICIENCIES OF A HYDRO-ELECTRIC SYSTEM.

The accompanying table gives an outline of the losses and efficiencies, for 1911, of the Seattle Municipal Light and Power Plant. This matter was presented by J. D. Ross in a recent paper before the Pacific Coast section of the American Institute of Electrical Engineers. The figures

Outline of Losses and Efficiencies for 1911, Seattle Municipal Light and Power Plant.

	Per cent all-day efficiency.	Total 1911 input, kw-hr.	Average 1911 input, kw.	Total 1911 loss, kw-hr.	Average 1911 loss, kw.	Per cent loss.	Per cent of penstock input.	Per cent of total loss.
Generating system	54.4	52,639,000	6,009	23,990,300	2,739	45.6	45.6	75.3
Penstocks	97.7	52,639,000	6,009	1,214,900	139	2.3	2.3	3.8
Generating station	55.7	51,424,100	5,870	22,775,400	2,600	44.3	43.2	71.5
Water wheels	60.7	50,758,900	5,795	19,944,400	2,277	30.3	37.9	62.6
Generators	93.5	30,814,500	3,518	1,990,800	227	6.5	3.8	6.2
Exciters	....	665,200	76	665,200	76	....	1.3	2.1
Station lights and control	....	175,000	20	175,000	20	....	0.3	0.5
Transmission system	91.6	28,648,700	3,270	2,413,500	276	8.4	4.6	7.6
Step up transformers	96.1	28,648,700	3,270	1,126,000	129	3.9	2.1	3.5
Transmission lines	98.6	27,522,700	3,141	378,000	43	1.4	0.7	1.2
Step-down transformers	96.6	27,144,700	3,098	909,500	104	3.4	1.7	2.9
Distributing system	79.2	26,235,200	2,994	5,448,700	622	20.8	10.3	17.1
City substation	98.7	26,235,200	2,994	346,400	40	1.3	0.7	1.1
S. Lights and control	....	317,400	37	317,400	37	1.2	0.6	1.0
Switchboard meters	....	....	.....	29,000	3	....	0.1	0.1
15,000-volt system	92.5	11,587,000	1,323	868,600	90	7.5	1.6	2.7
15,000-volt lines	99.2	11,587,000	1,323	93,500	11	0.8	0.2	0.3
15,000-volt transformers	93.2	11,493,500	1,312	775,100	88	6.8	1.5	2.4
Series street lights	86.3	2,672,800	305	367,200	42	13.7	0.7	1.2
Transformers	95.0	2,672,800	305	133,700	15	5.0	0.3	0.4
Series circuits	90.8	2,539,100	290	233,500	27	9.2	0.4	0.7
Cluster street lights	79.1	1,486,000	170	310,000	35	20.9	0.6	1.0
Cluster transformers	87.8	1,486,000	170	181,000	21	12.2	0.3	0.6
Underground cables	90.1	1,305,000	149	129,000	15	9.9	0.2	0.4
2,400-volt commercial system	76.2	13,178,400	1,612	3,123,700	357	23.8	5.9	9.8
Feeder regulators	98.6	13,178,400	1,612	178,500	20	1.4	0.3	0.6
Primary feeders	96.0	12,999,900	1,592	521,600	60	4.0	1.0	1.6
Transformers	88.8	12,478,300	1,532	1,391,000	159	11.2	2.6	4.4
Secondaries	92.9	11,087,300	1,373	782,600	89	7.1	1.5	2.5
Customers' meters	97.6	10,304,700	1,284	250,000	29	2.4	0.5	0.8
Direct-current system	35.7	673,200	77	432,800	49	64.2	0.8	1.4
Motor-generator	38.0	673,200	77	417,000	48	62.0	0.8	1.3
D-C. circuits	95.0	256,200	29	12,800	1	5.0	....	....
Customers' meters	98.8	243,400	28	3,000	.....	1.2	....	....

Summary: Total power loss .... 31,852,500 kw-hr. Average 3,636 kw.
Total power delivered to customers .... 17,304,900 kw-hr. Average 1,975 kw.
Total power delivered to street lamps .... 3,481,600 kw-hr. Average 398 kw.
Total delivered power .... 20,786,500 kw-hr. Average 2,373 kw.

Over-all efficiency, 39.5 per cent.

[1 kw-hr. at the customers' premises requires 1,364 gals. (5,163 liters) of water from Cedar Lake at average head of 590 ft. (179.8 m.)].

given are believed to approximate closely the true values, since great care was taken in the measurements made by frequently calibrated instruments. All results have been checked in as many ways as possible.

The Seattle plant is a hydro-electric system delivering water to two 1,500 kw. Pelton units and two 5,000 kw. turbine units under 600 ft. head through two pipes approximately 3½ miles long, one of which is 67¾ and the other 49 ins. inside diameter. The current is transmitted at 60,000 volts through two lines to Seattle, a distance of 38.7 miles, and is there distributed at 15,000 and 2,400 volts for use by approximately 20,000 customers and for the city street lighting.