cannot be considered as a criterion of the performance of the producer when working under proper conditions, viz., utilizing peat with from 25 to 30 per cent. moisture.

The results, however, were excellent, both as regards fuel consumption and behavior of the fuel in the producer. The fuel consumption for the three tests averaged a little less than 2.2 pounds per brake horse-power hour.

After the completion of the gas analytical laboratory a complete 30 hour test was made with the peat manufactured at the Government bog at Alfred. The peat used during this test averaged 30 per cent moisture. During the entire test samples of gas were taken and analyzed every hour. The calorific value of the gas was determined every 30 minutes by means of the Junker's calorimeter. Readings of both the voltmeter and ammeter were taken every 15 minutes. From these readings the effective horse-power of the engine developed during the test was calculated.

Before making the foregoing test, considerable time was spent in ascertaining the most suitable size to which it was necessary to crush the peat in order to obtain best results in the producer.

As determined by experimentation the peat should be of about the size of a hen's egg—for peat containing 30 per moisture. For peat containing less moisture larger sizes may be used, although the smaller sizes offer no difficulties to the operation of the producer regardless of the moisture content.

The satisfactory operation of the producer depends on the condition of the material fed to the lower zone, i.e., the material must be as free from volatile matter as is possible—since any tar distilled from the fuel in the lower zone cannot possibly be broken up, and, therefore, leaves the producer as a deleterious ingredient of the gas.

When these conditions are understood and the proper method of operating the producer learned it requires scarcely any attention from one day to another.

A few of the principal details of this test are as follows:

Producer cleaned and filled with peat	11.00 a.m.
Test started	11.00 a.m.
Test terminated and producer cleaned and filled	5.00 p.m. next day
Duration of test	30 hours.
Total fuel fired	4,900 lbs.
Total ashes	153.5 lbs.
Pounds coke lost through cleaning doors when poking and to be subtracted from total fuel fired	22.5 lbs.
Average load on engine	58.18 B.H.P.
Consumption of fuel as fired, 30 per cent. moisture per B.H.P.H.	2.80 lbs.
Consumption of fuel per B.H.P.H. fired dry	1.87 lbs.

Average heating value of gas:—

Gross	124 B.T.U. per cubic foot.
Net	116 B.T.U. per cubic foot.

The producer was poked every two hours—the vacuum on the gas main throughout the entire run varied but little from 28 cms. of water (11 in.). No trouble was experienced during this run nor subsequent runs from clogging of the cleaning system.

An average sample of the total peat charged was taken for analysis and a gas sample taken and analyzed every hour. The calorific value of the gas was determined every 30 minutes by means of a Junker's calorimeter.

Composition of the Gas by Volume.—The composition of the gas remained remarkably uniform throughout the later test.

The average composition was as follows:—

CO_2	9.9%
O_2	0.4"
C_2H_4	0.4"
CH_4	2.0"
H	9.8"
CO	20.6"
N	56.9"
	100.0%
Combustible gas	32.8%

Central Canada is not alone in these peat investigations, as Ireland has for generations sought methods and means to utilize this fuel in the place of coal. Investigation has generally shown former attempts in this direction to be without commercial possibilities. However, lately, according to the Dublin correspondent of the London (Eng.) Times, a really successful attempt has been made to use peat instead of coal for industrial purposes.

A 900 horse-power engine was installed two months ago by Crossley Brothers in the linen factory of Hamilton Robb at Portadown, County Armagh. Mr. Robb's manager states, as a result of his experiment, that with this engine an outlay of $57 a week on peat produces the same energy as was obtained by an expenditure of $69.50 a week on anthracite coal.

The new product has the further advantage of extracting tar from the peat to the value of $35 a week, making the actual cost of fuel only $22.

At Arvika, Sweden, experiments have been conducted using peat powder in the reduction of iron ore in the electric furnace.

The bottom electrode was found to cause damage to the hearth, hence was replaced with an iron electrode situated between the two carbon electrodes. Very good results were obtained.

Recently the Swiss succeeded in getting 2.65 tons of iron per H.P. year; 445 kilograms (981 pounds) of peat powder being required for the reduction.

The loss in weight of the iron electrode was found to be only a few kilograms per charge. The loss of the carbon electrodes was not determined, but was rather considerable.

The furnace is now being rebuilt with a view to utilizing the furnace gases for preheating the charge, and roasting the ore.

The Swedish government have decided to grant to Dr. G. de Laval—the distinguished inventor—the sum of $5,130 for further experimentation on his new process of wet-carbonizing peat. The Government peat engineer reports that de Laval's new process may solve the problem of continuous manufacture of fuel, independent of air-drying, which will be able to successfully compete with coal in many branches of manufacturing.

The following are the result of an analysis recently made in the Farm Laboratory of samples of peat from the Government bog at Alfred.

No. 1 is the sample supplied from the Alfred bog.

No. 2 is a sample submitted by an Ottawa purchaser.

	No. 1.	No. 2.
Moisture	24.07	27.78
Organic matter	71.23	67.81
Mineral matter or ash	4.70	4.41
	100.00	100.00