Each class of fuel must, of course, be used in a particular manner if the best results are to be secured, and peat requires special attention, because in its natural condition it contains approximately 90 per cent. of water. When the bog is thoroughly drained the moisture content may be reduced to 88 per cent. Mixing with dry peat or hay and pressing, the percentage of water can be reduced to 70 to 75 per cent., two pressings to 53 per cent., and by subsequent drying to 25 or 30 per cent. The degree to which peat has been humified has a considerable effect on the facility of extracting the water. Peat of recent deposit is more fibrous than the older beds, and water can be pressed out readily, but when humification has been carried to great extent hydrocellulose or gelatinous substance is present, and this absorbs water and increases in bulk until it has the consistency of soft soap. Well-humified peat, which has been thoroughly pulped and repulped, has the appearance, when dry, of a high-class lignite. It has a very fine texture, is hard and dense, and offers considerable resistance to breaking. The separation of the water from the peat has occupied the attention of many, and the data that is available is interesting information to those who are associated with the question of sewage sludge disposal, because the difficulties encountered are much alike.

Owing to the fact that peat is a low-grade fuel, which must be manufactured and sold at a comparatively low cost if it is desired that it should serve as a substitute for coal, or even when it is used in gas producers, the process of excavation, pulping, drying, and so on, must be arranged in such a way that the cost of labor and power is kept as low as possible. If peat can be manufactured successfully in Russia, Germany, Norway and Denmark, where the climatic conditions are not so favorable as those obtaining in Canada, it is within reason to assume that an even greater degree of success could be realized in this country.

The most promising way of utilizing peat is by gasification in gas producers and the recovery of the nitrogen. The total quantity of gas having a calorific value of about 140 B.t.u. per cubic foot is estimated at 90,000 cubic feet per ton of 2,000 lbs. of absolutely dry peat, or, say, 67,500 cubic feet from peat containing 25 per cent. of moisture. If 12,000 B.t.u. are allowed per b.h.p. hour, each ton of moist peat will give approximately 787.5 b.h.p. hours, of which about 75 per cent. will be available for power, that is, 590 b.h.p. hours. As already stated, there are about 65,000,000 tons of peat in Ontario, and the potential power of this fuel if utilized in this manner will be, roughly, 4,570,000 brake horse-power years, which would furnish 45,700 horse-power for 350 days per year for 100 years, so that Ontario has a valuable source and asset which is waiting to be utilized. But this is not all. The average percentage of nitrogen content in the peat beds which have been investigated is about two—it ranges from 1.26 to 2.77 per cent. If the efficiency of ammonia recovery process is assumed to be 70 per cent., the quantity of sulphate of ammonia from 2 per cent. nitrogen content will be about 100 pounds per ton of peat containing 25 per cent. moisture; consequently, the Ontario peat bogs are capable of yielding, through the agency of recovery gas producers, about 6,500 million pounds, or 3.25 million tons, of sulphate of ammonia. Spreading this over 100 years equals 32,500 tons per annum. This sells at present at about $70 per ton, but we will suppose, for the purpose of arriving at a conservative estimate, $60 per ton. Furthermore, let the value of energy be placed at $12 per b.h.p. per annum. Ontario alone possesses a potential gross annual income of:—

Gas power, 45,700 h.p. at $12.....	$ 548,400
Sulphate ammonia, 32,500 tons at $60	1,950,000
	$2,498,400

It will, of course, be necessary to pay for the cost of producing the power and sulphate, but it is not pertinent to the object of this article, which is to show that Ontario has a valuable asset in the peat beds, and what applies to Ontario is applicable to the other provinces. Saskatchewan, Manitoba and Alberta have vast areas of lignite which can be utilized, and these also constitute a most valuable natural resource that awaits utilization.

The gas may be used for many purposes—for driving gas-engines, raising steam, industrial processes, domestic heating, etc. As Ontario has a comprehensive hydro-electric system, it is manifest that peat can be used for the development of power only where hydro-electricity is not available at equal cost, but the production of gas will, doubtless, be utilized for other purposes. With regard to ammonium sulphate, it may be stated that it is used in immense quantities as fertilizer, and the bulk of it is derived as a by-product of the destructive distillation of coal. Dr. Lunge, in his fifth edition of "Coal Tar and Ammonia," states that "Synthetical production of ammonia from atmospheric nitrogen must find its limits in the impossibility of producing the requisite enormous amount of electrical energy, whether by water-power or otherwise. The principle source of ammonia will be always the nitrogen of coal," which will include peat and lignite. In 1915 Canada imported $1,087,000 worth of fertilizers of different classes, and, as the soil is reduced in fertility, due to gradual exhaustion, more fertilizers will be necessary. Peat and lignite, therefore, afford excellent local sources for the supply of ammonium sulphate. The following table will show what results are obtained by the use of this class of fertilizer:—

Country.	Sulphate of Ammonia per Acre. Lbs.	Total Crops Raised per Acre. Wheat. Lbs.	Barley. Lbs.	Oats. Lbs.	Potatoes. Tons.
Belgium	17.83	2,228	1,908	2,572	6.58
Germany	9.98	2,012	1,400	1,586	5.25
England	5.35	1,756	....	1,591	5.05
France	2.23	1,238	908	1,154	3.18
United States..	1.34	....	....	....	....

Sulphate of ammonia is especially valuable for the cultivation of beet-root. Its action is slower than that of nitrate of soda, but for that reason it is all the more lasting. It is absorbed by the soil and retained even after heavy rainfalls, whereas nitrate of soda is stated to be washed out. Sulphate of ammonia serves for preparing other ammonium salts, sometimes for liquor ammonia, for making ammonia-alum. A 10 per cent. solution of sulphate of ammonia is employed to render tissues, papers, etc., non-inflammable.

There are several gas-producers which give excellent results. The Mond type has been used in connection with peat in Italy and Germany. The Lymn producer is now taking a prominent position and is highly spoken of.

According to Mr. Haanel, it would be unprofitable to utilize peat for producer gas and the recovery of the ammonia unless the quantity of nitrogen is at least 1.5 per cent. of the dry sample. Fortunately, there are sev-