

THE PRODUCTION AND USE OF PEAT FUEL.

In a lecture delivered before the Modern Science Club of Brooklyn, N.Y., Mr. A. R. Maujer, of New York, remarked that peat is a combustible substance produced under certain conditions by the slow decay of vegetable matter. The character of peat depends upon the condition prevailing during this decay and on the nature of the vegetation from which it is formed. To the peat-forming vegetation belong nearly all of the mosses, heath plants, water and swamp plants, such as rushes, sedges and grasses, trunks and roots of trees, etc.

In order that slow decomposition may take place, free access of air to the dead vegetation must be prevented, else oxidation will accompany the decay and ultimately only inorganic substances will remain. Peat bogs are most prevalent in lowland districts, but they may occur in mountainous countries when drainage is impeded so as to form local accumulations of water.

Humidity is a very important regulator of the distribution of bogs. Wooded moors favor the growth of mosses, owing to the air there being more moist than in the open country. Hence it is that the bogs in low-lying areas seldom have trees buried in them, whereas in mountain bogs trees are plentiful, the growth of the moss being favored by the fallen trunks damming back the water so as to form pools.

The different classes of peat are divided into two large groups—moss peat and grass peat. The chief products from moss peat are, litter or live stock bedding, paper, filling and packing materials, insulating material, alcohol, fertilizer and in some cases, fuel, although from its porous nature, it is bulky, especially difficult to dry and if handled dry, falls to pieces easily.

The grass peats make the best fuel. They are heavy and compact and dry with comparative rapidity. As a fuel, peat from its nature may be classified between wood and lignite.

Peat is found in practically all parts of the world but particularly in the temperate zone. Holland has been using peat as fuel for centuries. Her present yearly consumption is something over a million tons. Russia produces over four million tons annually. It is estimated that there are upward of 11,000 square miles of peat bogs in the United States, exclusive of Alaska. In Canada an estimate based on a survey which is only partially complete, places the bog area there at over 37,000 square miles.

Among the factors which have prevented the growth of a successful peat-fuel industry on this continent are:—

- (1) Lack of knowledge of the characteristics of peat.
- (2) Lack of suitable machinery to handle same.
- (3) High cost of labor as compared with European conditions.
- (4) Low cost and abundance of other fuels, such as coal and wood.

Peat is a fuel of low calorific value, averaging from 6,000 to 9,000 B. t. u. per pound of dry substance, one pound of good coal is equal to $1\frac{1}{2}$ to 2 pounds of average peat. Although peat when burned under a boiler will generate steam, the quantity required is nearly twice that of coal, so that a larger grate area is required and the fuel must be more frequently fired. The ashes are light and can easily be removed. The flame is long and should put the heat where it will do the most good, in the tubes. From its light

and pulverent nature, when the draft is forced, considerable fuel might find its way into the stack before complete combustion.

An important factor is that of the time required to dry the peat. This varies with the extremes and middle of the season, setbacks by rains, heavy dews, and possible frosts; on the average peat properly laid out may reach the necessary degree of dryness in from two to three weeks, if it is not spread too thickly.

One acre of drying ground carried to a depth of 4 inches would contain 453 tons of fresh peat having 90% of moisture, or 68 tons of air-dried peat of 33% moisture. The acre of drying ground would be covered 9 times in six months, and the fuel produced per acre per season, that is for the year, would be a little over 600 tons.

By his calculation a plant using 1,000 h.p. requires 36 tons of peat per day or 13,140 tons per year. This output would necessitate 22 acres of drying ground.

Two methods of removing water from peat are often advocated, pressing the water out and evaporating it by artificial heat. The speaker did not earnestly advocate the use of peat presses, but such, when being considered, should possess continuous and rapid operation, great strength, and screens that will not clog up and yet will hold the peat from passing through.

As half a year's fuel must be stored for the winter, it is evident that the storage plant must be quite large on account of the amount stored and its bulky nature. For the plant delivering an average of 1,000 horse power continuously, about 6,500 tons must be stored, and as a cubic foot of peat fuel weighs about 25 pounds, the volume occupied by 6,500 tons is about 520,000 cubic feet.

By using machinery, peat fuel ought to be manufactured for \$1 per ton or less. If so, it can compete with coal at \$2 a ton.

The coal deposits of Canada are all located in the western and eastern portions of the country; practically no coal is found in the central parts. The anthracite which is used in the central provinces is obtained from the Pennsylvania districts. Because of expense of transporting it such a great distance the cost is high. In Ontario and Quebec anthracite of very ordinary grade costs \$7.50 per ton; in Manitoba the cost is as high as \$10. For these reasons a satisfactory substitute for coal which could be made to compete with it commercially would find a ready market, and the Canadian Government, recognizing the economic possibilities in a thriving peat-fuel industry, is endeavoring to stimulate the interest and enterprise of bog owners and manufacturers by demonstrating that peat fuel can be produced cheaply and that power for industrial purposes as well as heat for domestic use can be obtained therefrom. To accomplish this a portion, comprising about 300 acres, of what is known as the Alfred bog has been acquired and fuel is being manufactured. The peat is used at the Canadian Government's fuel-testing station in a peat producer-gas plant of 60 horse power capacity. The bog is situated about 40 miles east of Ottawa in Prescott County, Province of Ontario. It covers an area of approximately 6,800 acres. The peat varies in depth from 3 to 17 feet. That the peat of the Alfred bog is suitable for fuel is shown by the analysis which was obtained from Bulletin No. 4, issued by the Canadian Department of Mines.