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A New Industry For The Maritime Provinces

What It Means to the Provinces to Use Coke as a Domestic Fuel Instead of Anthracite

By Ernest G. Mackay

The accompanying article regarding the use of coke, has taken the Maritime provinces as a basis of comparison, but the figures apply equally well to Quebec and Ontario where millions of dollars are sent out of the provinces annually to the United States.

This article is valuable inasmuch as it demonstrates the value of coke for domestic use and the most efficient method of using this valuable fuel.

All down through the ages necessity has been the mother of invention and the factor which led to greater economy and conservation of resources.

In the iron and steel industry, necessity drove the manufacturer from wood, charcoal and anthracite to the use of coke for smelting purposes. The change from one fuel to another was brought about by the shortage of wood within reasonable range of smelting operations, the ever-increasing demand for larger tonnages of iron and steel at a lower cost, and the desire to save wood for other purposes. In the use of coke as a domestic fuel, history is repeating itself. From the use of wood, bituminous and anthracite coals, we are turning slowly but surely to coke as a fuel for all purposes where anthracite was formerly used, and for very logical reasons.

In the Maritime Provinces we are fighting hard for Maritime rights. Unfortunately for us, but not for the rest of the world, our people are leaving in thousands each year and we are trying hard to keep them at home and to find useful and remunerative employment for them. In order to build bigger and better Maritime Provinces, and to benefit Canada as a whole, it is essential to keep our money at home, rather than to send it out of the country where it will be used to stimulate foreign industry, while our own industrial plants remain idle.

In the year 1923 approximately 152,980 tons of anthracite coal were brought into the Maritime Provinces at a cost to the consumer of $2,600,660, as follows:

Nova Scotia	57,820	tons
New Brunswick	91,000	"
Prince Edward Island	4,160	"
	152,980	tons

Assuming that the average consumer paid $17.00 a ton for this coal delivered in his cellar and that the dealer paid $15.00 a ton for the coal delivered on his dock or in his sheds, then 15x152,980 = $2,294,700 went out of the country; 2x152,980 = $305,960, cost to handle and deliver; 17x152,980 = $2,600,660 cost to consumer.

With these figures before us it is evident that we should make every effort to avoid this large outlay. That this foreign fuel bill is avoidable has been demonstrated by experiments carried on during the past five years with domestic coke.

We have the coal, we have the coal washers, we have the coke ovens, we have the by-products recovering equipment, and we have the men with brains and experience in the industry. Is it economically sound business, then, and are we fair with ourselves when we go abroad for this class of fuel? Let us consider for a moment what economic advantages would accrue to the Maritime Provinces if coke were used instead of foreign anthracite.

Now if 152,980 tons of metallurgical coke had been used, made from our own coal, mined and coked by our own workmen, shipped over our own railroads or in our own ships, the advantage would be approximately as follows:

Assuming that the average consumer paid $17.00 a ton for his anthracite and that the average consumer, big and small, paid $14.00 a ton for coke, then:

1st Consumer saves $458,940, or $3 a ton; 2nd A new market for 305,960 tons of coal; 3rd Giving continuous employment yearly for 600 miners; 4th Continuous employment for 200 men at coke plant; 5th Additional freight for Canadian railroads, 152,980 tons; 6th Gas: 3,059,600,000 cubic feet, $764,900; 7th Ammonium sulphate, 7,649,000 lbs. $267,715; 8th Tar, 3,059,600 gallons, $61,192; 9th Motor fuel, 917,800 gallons, $229,470; 10th Royalty on 305,960 tons of coal, $38,245; 11th Cost of anthracite, $2,294,700. Total ,3,658,222.

In the year 1870 the first coke ovens were built in Nova Scotia to produce coke for metallurgical purposes, and since that time every effort has been made to improve the structure and quality of the coke which is so essential to the successful operation of the iron and steel industry. In 1890 a modern coal-washing plant and 54 Bernard retort coke ovens were erected. This was the first unit of its kind put into operation in Canada and probably the earliest plant at which the complete operation of washing to purify coal and coking it for metallurgical use was successfully practised in America.

With the object of improving if possible, the quality of the coke, systematic tests have been made from time to time of Nova Scotia coals in every type of washer and coke oven in Europe and the United States; with the result that to-day is to be found in Sydney, Nova Scotia, the "last word" in modern coal washers, coke ovens, and by-product equipment.

The quality of the product of this plant is beyond question, and can be honestly recommended as a good, clean efficient, high-carbon fuel, which can be used to advantage in any type of oven, stove, furnace, or boiler where anthracite is now being used.

In the process of manufacturing metallurgical coke, the coal is selected from the mines producing the best metallurgical coal, crushed fine so that particles of stone and slate may be separated from it by gravity in a British Baum washer. After washing, the coal is conveyed to storage towers at the ovens where it dries preparatory to being charged into the ovens for coking. The coking operation is simply an expulsion of the volatile combustible matter in the coal in a long narrow air-tight chamber which is kept at a high temperature by the circulation of the gases around the oven walls.

The final product is a hard, porous coke of the contrated carbon, of the coal charged into the oven, practically free from impurities. The coke is pushed out of the chamber by an electrically-operated pusher into an electrically-operated car on the opposite side of the oven, quenched, and sized for the various purposes for which it is intended.

The volatile matter with its valuable and exceedingly complete mixtures, passes through the elaborate and costly distillation plant where the by-products are recovered. Surplus gas amounts to about 60 per cent of the total gas expelled from the coal, the balance is used for heating the oven chamber. The value of the gas, of course, depends on the market, and the location of the plant is an important factor.

Ammonium sulphate is one of the best inorganic manures known. Its value lies in its high nitrogen content, so essential to plant life. It is also used in other forms for making artificial ice, for cleaning and in the manufacture of nitric acid.

Tar is used in the manufacture of drugs, dyes, explosives, paints, road dressing, roofing paper and as a fuel. Motor fuel is made from the light oils, which are also the basis of TNT and herein lies one of the most important features of the plant as an asset to the nation in time of war.

Most people have the idea that the by-products recovered in the coking process are "velvet" and that the price of coke should be much lower than it is, but when it is considered that modern coke ovens, with by-product recovering equipment, cost today approximately $75,000 per oven to build, and each oven produces about seven tons in 24 hours, and that it takes about two tons of raw coal to produce one ton of coke, it will be seen that the price is not exorbitant. The sale of by-products only bring their fair share of profit, except where gas can be sold for domestic lighting and heating.

Metallurgical household coke, besides developing a higher boiler efficiency than any other fuel, allows a longer interval between the firing of the furnace than with other fuels. To get good results from a coke fire the draft must be kept under control. The amount of draft required depends on weather conditions and size of coke. Generally speaking, it takes much less draft to burn coke than it does to burn anthracite. If too strong a draft is used after the fire is started, the coke will burn too fast, make the house too hot, and require more frequent firing.

If the size of the furnace will permit, the fuel bed should be carried about 18 inches thick. A thick fuel bed helps to check the draft and gives slow uniform combustion and uniform temperature in the house. With a thick fuel bed, the fire will last a long time without requiring attention. If a thin bed is carried, the coke burns too fast, giving hot, uneven fire that burns out quickly and requires frequent firing. A thin fire also tends to produce more clinkers.

A coke fire requires less shaking of the grate than a coal fire. In ordinary weather, one shaking a day, preferably in the morning is all that is necessary. Usually better results are obtained when the grate is not shaken too much and it should never be shaken so much that pieces of hot coke fall into the ash-pit. Therefore in shaking the grate the ash-pit should be watched and the shaking should stop as soon as the first sparks appear in the ash-pit. Between firings the fuel bed should be stirred as little as possible. If clinkers form over the grate, they should be pulled out just before firing. Usually the best time to remove the clinkers is in the morning when the fire is started for the day's run. It often happens that this one cleaning is sufficient and sometimes the fire may go two or three days without removing the clinkers, particularly in mild weather. The less the fire is disturbed the better satisfaction is obtained with coke. The ash should not be allowed to accumulate in the ash-pit until it reaches the grate, for then the grate will be injured. Therefore, it might be well to remove the ash from the ash-pit each day.

By long experience it has been found that the best size of coke for house-heating furnaces and stoves is a mixture between one half inch and two inches. If a large size is used, the coke burns too fast and requires more frequent firing. For open grates the size of the coke may be somewhat larger. It should be remembered that coke is much lighter than anthracite and bituminous coal. Therefore, a greater bulk of coke should be fired at a time than when burning coal. The directions for burning coke can be condensed into five rules as follows:

1. Carry a deep bed of fuel; a bed sults.
2. Use very little draft after the fire is started and keep it always under control.
3. Do not stir the fuel bed; clean the fire if possible in the morning.
4. Use size coke, one half inch to two inches, for furnaces, boilers and stoves.
5. Do not allow ashes to accumulate in the ash-pit.

HOUSEHOLD NOTES

Grease the cup in which molasses is measured and every drop will run out.

Leftover stewed tomatoes can be used in the macaroni or rice and cheese casserole to make a delicious scalloped dish.

If metal teapots are not used for some time they are likely to become musty. This may be prevented by dropping a lump of sugar into the pot before putting it away.

Carrots and peas are good to eat and good to look at when cooked together.

Never wash rubber stockings in soapy water. The alkali in soap rots the rubber. Wash in warm water with a brush. They last much longer if treated in this manner.

In New York as Spring advances the floral wreath becomes more and more accepted as a coiffure ornament. The wreath, or coronet, may be of artificial flowers sprinkled with a dew of brilliants; or—more formally—of gold or silver with real jewels. Now and then a wreath of soft feather flowers is seen.

Topics of Interest to Women

Negligee or madonna blue georgette shown in New York to-day is made on severe Grecian lines. The flowing sleeves, falling to the knees, are fringed with very long, slim silk tassels in half a dozen pastel shades.

In Paris the bustle—the much discussed bustle—has been achieved in some cases by puffy folds of georgette or chiffon arranged as an enormous bow in back. With this bustle effect goes, strange to say, a slight lifting of the skirt in front.

Now and then the costume without a belt—still the leading style in tailor mades—takes unto itself a "false belt." Without restricting the waist line at all, the costume is given a stimulated girdle of braid or stitchery.

In London the shortness of skirts is especially noticeable to-day in gowns meant for morning wear. In the three-piece costumes the skirt is likely to fit very snugly around the hips, and then widen at the hem into a flare.

Stakes and Trellises

The necessity for support for plants is never so apparent as when a heavy rain or wind has flattened some favorite stock and there are no supports in the way of stakes or trellises at hand. The winter months are an excellent time to start a collection of stakes and to build or buy trellises for tomatoes, find poles for the beans, and brush for the peas or stout stakes or posts upon which to string chicken wire. A lot of time will be saved by taking thought now.

Stakes of various sizes and strength are more necessary in the flower garden, and the neatness of beds and borders is often ruined by sprawling plants which have toppled over into paths or fallen over other plants. Heavy brittle-stalked plants like dahlias and perennial delphiniums need stout stakes. An offer of a nickel apiece to the children of the neighborhood is likely to produce a fine collection of broomsticks and handles from other broken or discarded tools which make ideal stakes for the flower garden.

Better still, buy bundles of the bamboo stakes now sold in different lengths by seed houses for the lighter plants or uniform-sized and green-painted heavier stakes for the dahlias and similar plants needing support.

Many of the perennials need staking. A stake for each system is the proper method. Tying them in a bundle to one stake ruins the effect of some of the finest plants.

Six-foot stakes will be needed for the tomatoes trained to a single stem, driving them well into the ground so that they will not be toppled by the weight of the vine during a rain or windstorm. Tie the plants loosely at short lengths with rags or raffia. Ordinary cord is likely to cut or saw the stems.

Start laying in supplies of stakes and if there is any brush from pruning operations, cut it into proper lengths to hold the sturdier dwarf peas and to use as a foundation for the drapery of perennial asters and other floppy perennials and annuals which are never so handsome as when firmly held in fluffy luxuriance by a twiggy branch concealed by foliage and flowers.

Flowers in Shade

The shady part of the garden that will not grow even decent grass, can be made beautiful by the use of the tuberous begonia. So long as a bit of the ground can get the sun in early morning or late afternoon or for an hour's duration during the middle of the day, a bed of tuberous begonias planted there will bring charming results. This plant does for the shady spot what the geranium does for the sunny location, but it does more because of the variety of colors secured and greater beauty of the foliage. The tuberous begonia cannot be used in an open location facing the sun during the hot part of the day, because the leaves are apt to curl up and wither, says the Ontario Horticultural Association.

This flower has been greatly developed in recent years. The best varieties produce flowers from four to six inches across, and bloom from July until frost takes them off. They require rich soil. When the space is reached by the roots of trees they need plenty of moisture. If started in light soil in pots or flats set in a warm place during the first week in April, they will be almost ready to bud by the first of June, but some growers prefer to plant the tubers direct in the soil early in May, or as soon as the ground would be ready for potatoes.

The plants should be set 12 to 15 inches apart, about two and a half to three inches deep, with the hollow side of the tuber uppermost.

The surface of the soil should be kept stirred during the summer, and a dressing of bonemeal or other manure, preferably from the poultry yard, applied from time to time.