

were accustomed to receive; the compelled use in certain districts of wood for fuel; the restrictions upon the use of natural gas; the prohibited use in many cases of anthracite coal and the substitution therefor of bituminous coal; the day-light saving legislation on both sides of the Atlantic; the cutting down of illuminated advertising and the enforced "lightless nights;" these and many other facts must be held in mind as indicating how widespread and absolutely necessary have been the efforts for economy with respect to fuel.

Although the efforts of the fuel administration, the termination of hostilities and a providentially mild winter, have reduced the great stress which has existed in connection with the fuel situation, nevertheless in the period of reconstruction and afterwards, the demand for fuel will doubtless be such that many of the restrictions placed upon its use and conservation during the war period will, in one form or another, find permanent expression; and hence it may be accepted that many of these special requirements made necessary by the exigencies of war are here to stay.

In Europe the great lesson of how to use coal economically has been learned. As a leading United States journal recently stated:—

"They have learned how to use coal economically in Europe, through having to pay all the way from \$20 to \$90 a ton for it. The man who is paying that does not need any fuel administration to urge him, on patriotic grounds, to stop wasting coal. He develops the keenest interest in that subject without prompting; and he saves the coal."

The writer goes on to declare that the government of the United States does not propose to dispense with its regulation of the coal industry, and adds:—

"The government will not take its hand off; it wants poor people to have a chance of fuel too. It gives the people the benefit of an inexorable price. They ought to show their appreciation by using the coal just as carefully as though they were paying the European price."

Now, our chief object in again specifically referring to this fuel problem is this: Canada has by no means wrestled as she should and must with the solution of her national fuel and power problem. We are glad that peat-producing equipment is being constructed, and we are glad to know that the building of a lignite briquetting plant is in progress.\*

These efforts, which are certainly moves in the right direction, should be given the best possible support. Such efforts, however, should have been undertaken and consummated years ago. While waiting for relief from lignite production, etc., Canada, by properly applying the lessons of the past fuel shortage, may effect economies in the use of fuel which will result in saving much greater quantities of coal than will probably be produced by such peat and lignite plants as may be in operation within the next few years.

We desire, therefore, to emphasize in the strongest possible manner the need for making every reasonable improvement which will result in the saving of fuel. The best possible efforts under government and other expert engineering guidance should be made to make permanent such economies as have been demonstrated through the efforts of fuel-controlling and other organizations in European countries, in the United States, in Canada and elsewhere. Let us now consider some of the chief means by which these economies have been and may be effected:

#### Saving Power and Light in Factories

Efforts were made by the United States Fuel Administration to induce several coal-using factories to effect economies in light and power, by the utilization of more

efficient lamps; the cleaning of dirty windows; the re-arrangement of machines and shafting and the proper alignment of shafting; changes in elevator service; the insulation of steam piping and the cutting out of unnecessary steam lines; the grouping of machines in a manner to flatten as much as possible the load curve; the testing out of power circuits for relationship of capacity with a view to their better inter-connection; the stopping of motors when the machinery to which they are attached, is idle; the correction of motors and other apparatus which were out of adjustment; the installing of proper protection about doors, windows, elevator shafts and stair areas, etc. Such efforts have resulted in effecting a coal saving in factories of from 11 to 34 per cent.

#### Elimination of Uneconomical Plants and Processes

In the United States there were found in factories, office buildings, hotels, apartments, institutions, hospitals, etc., about 30,000 local electric-generating plants. Many of such plants were readily supplied from some adjacent large central station. Where changes were made the results indicate a general fuel saving of from 20 to 60 per cent.

Fuel is being saved in industrial furnaces where used for direct heating,—such as is necessary in the clay products industries. The branch of the United States Fuel Administration in charge of this work estimates a probable annual coal saving of 3,000,000 tons.

If time permitted, we might touch upon other savings being effected in special manufacturing, such as in the refrigeration industry; by the increasing of efficiency of the modern steam turbine; savings resulting from standardization; from regeneration of electricity by improved methods of braking; the saving due to the employment of the "skip stop" system for railways; the staggering of hours of closing of factories; the savings effected by the greater utilization of gas production from coal; savings by the better combustion of coal and the avoidance of wastes resulting from the smoke nuisance; and the enormous savings possible by the electrification of steam railways. We shall, however, here have to pass these subjects.

#### Investigations in United Kingdom

In the United Kingdom the methods of mining and using coal have been the subject of an important and comprehensive investigation by the Coal Conservation Committee of the Ministry of Reconstruction. Its final report was issued in 1918.

The present coal consumption for power purposes in the United Kingdom is at least 80,000,000 tons. By proper co-ordinated and centralized systems of power production and distribution for the whole country, it is estimated that 55,000,000 tons of coal per annum might be saved, and in addition the following important advantages would result:—

"A reduction in the cost of transport in carrying coal.

"A possible saving in coal consumption for domestic purposes (the consumption for which purpose is now probably 35 million tons per annum).

"The reduction in the cost of coal handling involved in house-to-house delivery and general coal distribution.

"The great advantages and economies which would result from the more extended use of electricity in the household for heating, cooking and cleaning purposes in the way of labor-saving devices, reduction of smoke, increased cleanliness, etc.

"The possibility of utilizing the coal at present left in the pits or otherwise wasted.

"The possibility of extracting by-products, etc., before consuming the coal for power purposes.

"The increase in railway electrification, with its attendant advantages, which a comprehensive electric power supply system would render commercially possible and profitable."\*

All these savings and advantages taken together show a total possible national advantage which can hardly be put

\*Consult "Carbonizing and Briquetting of Lignites," by W. J. Dick, Commission of Conservation, Ottawa, 1917; also by same author, "Canada's Own Coal and the Fuel Problem" in "Industrial Canada," April, 1918; also, "The Briquetting of Lignites," by R. A. Ross, being report No. 1 of the Honorary Advisory Council for Scientific and Industrial Research, 8vo, 29 pp., Ottawa, 1918; also, "Fuels of Western Canada and Their Efficient Utilization," (revised edition) by James White, 8vo, 44 pp., Commission of Conservation, Ottawa, 1918.

\*See "Final Report," Coal Conservation Committee of Ministry of Reconstruction, folio, 89 pp. (Cd. 9084), London, Eng., 1918.