The coke obtained from retorting the gas is soft and loose in structure, and may be used in domestic furnaces; its disadvantages for this purpose are its bulk—which necessitates more frequent firing than with coal and larger storage space—and its tendency to clinker.

The choice of installing coke ovens or gas-making retorts, both of which require much the same class of coal, obviously depends upon the possible market for the products. The development of a domestic fuel trade in the soft coke is possible, if a suitable market can be found for the gas. Metallurgical coke, on the other hand, is not so suitable for domestic purposes, since it is very hard, difficult to ignite, and requires a strong draft to burn it. Nevertheless, it may prove a valuable and economical substitute for anthracite coal, if sold at a reasonable price.

(*c*) The third type of station represents the most economical means of generating power where coal is reasonably cheap and all the exhaust steam may be used for heating. The prime mover may be either a steam engine or steam turbine of a comparatively cheap type, and no condenser is required since the power may be looked upon as the by-product and the steam as the most valuable product. It is not possible frequently, however, to find useful employment within a small area for the exhaust steam, and heat losses prevent the transmission of thermal energy in the form of steam or hot water over a large area. On the other hand, it may prove feasible to generate power in plants where a heating load exists and transmit electrical energy to customers in the neighborhood.

(*d*) This is the most popular type of power plant, and in large sizes consists of boilers, turbo generators and condensers. It is too well known to need description; but it is interesting to note that steam turbines are made of 70,000 kilowatt capacity, and operate with steam pressures and temperatures as high as 350 pounds per square inch and 690° F.

Each of these stations has a field of use. To say what field, without more information, would be mere speculation.

Hydro-Electric Energy for House Heating

There is a prevalent notion in the public mind that the country should settle once for all the difficulties and inconvenience of securing and burning coal for heating houses by developing and using water-powers for this purpose.

At first sight it seems reasonable to reduce the consumption of our transitory possessions, the fuels, by using a continuous source of energy, which is at present going to waste. It is pleasant to contemplate the substitution of the cheerful electric radiator and switch for the complications of the present system. But the substitution by this method is based on a wrong principle.

Recurrence to the previous remarks on the laws of conversion of energy will show that the conversion of electrical energy into heat, as when a current flows along a conductor, is a degradation of energy. To use this highly available form of energy for a simple thermal process can only be taken as a confession of lack of resourcefulness to provide a more suitable load.

To emphasize the misuse of electrical energy by direct degradation into thermal energy, it is proposed to see how its availability may be put to proper use for the purpose served by the direct radiator. The result, which follows from a suggestion of Lord Kelvin in 1852, will be surprising; for it will show that it is possible to render more kilowatt hours available for heating the house than would be registered by the wattmeter. The method is to use the electrical energy to drive a heat pump. That is to say, the energy delivered to the house is the sum of the electrical energy and the energy obtained from a cold source. Supposing a reversible engine, the supply of heat from the freezing of water, and the temperature of delivery as 155° F.; for every kilowatt hour paid for, 5 kilowatt hours would be delivered to the system. Since no actual engine is absolutely reversible the efficiency would be less than that shown, but even supposing only 2 kilowatt hours per kilowatt hour to be possible, it is clear that use of the thermodynamically irreversible radiator, when the partially reversible heat pump is much more efficient, would be a waste of energy.

Were the domestic heating load constant or nearly so throughout the year, it might be profitable to examine the practicability of this scheme. But the ratio of maximum to minimum load is higher than would allow of a rational diversion of hydro-electric energy for this purpose.

Conclusion

In conclusion it is pertinent to point out that an engineer introduced the present age of energy. It came with Watt's invention of a steam engine, and with it began the slow and sure depletion of our stores of energy. It is for the engineer to prolong this age. He must not fail to draw energy from the right source, through the best channels and use it with a minimum loss. And there is ever before him an immeasurably greater question. It is the consideration of the availability of the natural continuous supply of energy for the generation of the world's requirements of heat and power.

MONTREAL BRANCH, CAN. SOC. C.E.

Following is a list of nominees for office in the Montreal Branch of the Canadian Society of Civil Engineers:—

For chairman—Sir Alexander Bertram, Walter J. Francis, R. M. Hannaford; one to be elected.

For vice-chairman—J. A. M. Duchastel, Arthur Surveyer, R. M. Wilson; one to be elected.

For secretary-treasurer—Frederick B. Brown, Harry M. Lamb; one to be elected.

For committee—M. B. Atkinson, John S. Bates, J. A. Burnett, A. Crumpton, A. Frigon, H. G. Hunter, A. E. Johnson, W. D. Lawrence, O. Lefebvre, J. W. Orrock, L. G. Papineau, P. L. Pratley, Stewart Rutherford, J. A. Shaw, F. P. Shearwood, A. D. Swan, W. Chase Thomson, K. B. Thornton; six to be elected.

These nominations were presented by the nominating committee at a meeting of the branch held on February 28th, and have been sent out to members in the form of a letter ballot.

WILL ORGANIZE HALIFAX BRANCH

The establishment of a Halifax Branch of the Canadian Society of Civil Engineers has been approved by the Council of the society and it is expected that arrangements will be completed at an early date. The secretary of the society has been delegated by the council to go to Halifax for that purpose.

The Engineers' Section of the Ontario Municipal Electrical Association will hold its semi-annual meeting March 13th and 14th. The meeting will be held in Room C. 26, Chemistry and Mining Building, University of Toronto.