

SMOKE AND ITS PREVENTION.

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[In view of the importance of the prevention of the smoke nuisance in the cities and towns of Canada, the Monetary Times has requested Mr. W. H. Booth, who has studied the subject for many years, and is looked upon as an authority to discuss the matter in these columns. Mr. Booth tells the story of smoke prevention in a manner which will interest every Canadian citizen, and with a freedom from technicalities.]

It may not be possible entirely to prevent smoke from steam boiler furnaces, but nevertheless its production can be reduced to very small proportions, and black smoke entirely prevented by observing correct principles in furnace design and construction. The first cause of smoke is probably the neglect to provide an adequate air supply at the correct locus. The next cause is the endeavour too quickly to abstract heat from the gases before they are burned.

Insufficient space in a furnace will often cause smoke to be produced, because this fault shortens the path of the gases on their way to the boiler heating surfaces. Why is a common vertical boiler so great a sinner? Because the gases from the coal rise vertically from the grate surface and are not mixed with air.

Similarly the locomotive smokes from the same cause. Smoke will be formed because a boiler is worked too hard, and it will also be formed when a boiler is too easily worked unless the arrangements for regulating the air supply are correctly devised. Bituminous or smoky coal does not contain much actual elemental gas. It contains a small percentage of hydrogen, and this light gas is combined with part of the solid carbon of the coal and has the power of converting many times its own weight of carbon into hydrocarbon gases.

These gases burn readily if mixed with air and maintained hot until they have become thoroughly combined with air, or burned. If the combustion is checked, black smoke will be formed because some of the carbon is thrown out of combination and is not in contact with air hot enough to burn it. An ordinary central air tube, petroleum or oil lamp, is an example of very smoky fuel being burned perfectly. Stop the central air supply and smoke will be produced at once. Turn up the wick too high and again smoke will be made because there is more oil gas than there is air to burn it. Take a lamp that is just turned up so far that it will smoke if the stack be turned any higher, and, instead of a glass chimney use one of iron with a surrounding jacket of water. Again smoke will be produced, not because of lack of air or of mixture but because there is too low a temperature, for heat has been abstracted from the flame by means of the water cooled plate chimney before the gases have been completely burned. The oil lamp can thus be used to illustrate all the phenomena of soft coal combustion, for oil is, all said, merely a very soft coal. Where soft coal may contain say 5 or 6 per cent of hydrogen, the petroleum oils will contain 16 per cent of hydrogen.

Nothing in the shape of coal will produce so bad a smoke as may be made with oil. On the other hand oil can be very intimately mixed with air, and, if the necessary condition of high temperature be maintained, oil can be burned without smoke in a furnace of correct design, as pointed out in my book on "Liquid Fuel and its Combustion," published in London by Constable & Co.

So finely floured bituminous or soft coal will burn perfectly like gas if blown by an air spray into a suitable furnace and it would be best so burned were there not difficulties with the emission of the dust or consumable ash from the chimney top.

In boilers of the Lancashire type, worked under good conditions, there is no smoke formed by a good fireman. This teaches us just where the critical point arises.

The only fault is perhaps that of insufficient temperature. But this knowledge, properly applied, enables any furnace to be improved. In many cases the design is so bad that but little good can be effected, but an expert engineer can tell this to the owner and save him from spending useless money on a hopeless case. Mere apparatus is in itself of no use unless such apparatus happens to fill a gap in the group of conditions necessary to perfect combustion. If it should do this then the maker of the apparatus gets some credit. If it should not give success it is because some other gap yet remains unfilled.

The chemistry of the combustion of bituminous coal is, in short, very simple. It is only to ignorance of such chemistry or futile attempts to circumvent the laws of chemistry, which are Nature's laws, and are not to be disobeyed, that smoke is due. For twenty years, these simple facts have been insisted on by the writer. He did but add something essential to the teachings of Mr. Wye Williams of 50 years

ago. The facts as demonstrated for many years by the author are now accepted by Professor Breckinridge and Professor Kent and others as correct, and a body of scientific thought is now engaged in preaching the doctrine so long insisted on by the present writer.

MONEY AND MUNICIPALITIES.

A municipal census gives Sherbrooke a population of 14,713, an increase of 763 for the year.

The Unionville School District No. 16 (P.O. Unionville), Ont., has disposed of school debentures to private parties.

Sherbrooke ratepayers have voted a bonus to the Fairbanks Company, of St. Johnsbury, and have given a franchise to a public steam-heating company.

The citizens of Brownlee, Sask., which in May was merely a place of tents, are preparing to incorporate as a village, having many wooden business houses.

The City of Fredericton, N. B., have sold between \$40,000 and \$50,000 of the re-issued bonds. It is stated that none of these have been sold as low as 95, and that a large percentage of them were sold for 98. Almost the entire debt of the city, amounting in all to \$180,000, will be due during the next few weeks.

A by-law approving of the sale of debentures to raise \$4,000 for expenditure on sidewalks, grading and improving streets has been carried at Lumsden, Sask. Donald Jeffrey, of Lumsden, offered to purchase the debentures. The town council will not require to look for a purchaser in the East. There are others in town prepared to purchase if Mr. Jeffrey declines.

FACTORY LOCATIONS.

The following Canadian municipalities are offering inducements to secure manufacturing enterprises. Those interested should correspond with the parties named below. In order to facilitate the bringing together of manufacturing firms with municipalities ready to make special concessions, we are charging a very nominal rate for cards in this column. It will be furnished for the asking.

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WM. SHEARER, Sec'y. Board of Trade

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CHARLES F. ROLAND,

Industrial Commissioner,

The Winnipeg Development and Industrial Bureau

August 3, 1907.

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PACIFIC SEC

Vancouver Office: Representative: A. 417 Richards Street.

ORIENTAL LABOR.

Twelve Hundred Japanese for British Honolulu—Prospects of Another Four Thousand Dollars from F

Monetary Times Office Vancouver

This has been a week of excitement over labor unions on account of the Japs from Honolulu. The steamer "Kurokawa," arrived in port on Thursday night until yesterday morning that the Dominion Inspector got through with his work of examination. Care was taken by the company bringing them here fit and supplied with the necessary amount they must have to obtain admittance practically all were passed.

Keir Hardie to Visit Jap and China Town.

On Wednesday, a committee of the Town Council, after a conference with Mr. R. M.P., had the latter send a telegram to calling attention to the matter, but no notice of this. The Japanese consul wired to H. the Japs not to come, but this advice was

The labor men are taking the matter and purpose having a public demonstration when Mr. J. Keir Hardie, the noted British MP, arrives here next week. They will also take through the Chinese and Japanese quarters the un-British conditions which exist there be personally informed when it comes to a Imperial House.

It was declared at the meeting of the C.P.R. was responsible for this influx of pole, Western Executive of the company, denying this statement. It matters little mental in bringing these men here; the Province is being flooded with an alien will have at least the effect of increasing the exists to a more or less degree between in British Columbia.

Coast cities are beginning to look with prospect of a shortage of coal next winter. been mentioned before, but new light is brought the action of the Vancouver Gas Company, permission to store fuel oil, stating that it will to get a coal supply. Then, too, all the vessels the coast shipping and loading for Australia coal is being brought to the Pacific coast.

Supply Domestic Coal Needs First.

In British Columbia the millionaire owners are protected by a duty, which prohibits coal from Washington State. The result is that a very high price charged, an increase of \$1.00 per ton has been made and maintained because of the people are put to great inconvenience. Last as far as suffering, while at the same time of coal were being shipped daily out of the extremely probable that the Government will to in the matter, and either asked to prohibit the export until the domestic supply

In the mining country a shortage of coal is imminent unless another strike occurs. Not only sent companies operating on a larger scale are getting into the field. The Map Company has been organized at Spokane in Western Alberta, and A. C. Flumerfelt, International Coal and Coke Company, has purchased 7,000 acres of coal lands adjoining the Galt Coal Company at Lethbridge. All producing for the interior and Western markets.

On the coast, the mines of the Nicola give an increased supply, but until these coast cities it will not be known just what have on the market.

To People the Province.

The appointment of a special committee Canada Immigration Association to arrange British Columbia so that co-operation may be bring this Province into the scope of an organization has done good work in enlisting capital and migrants for the West. Mr. Herbert Cuthbert the Victoria Tourist Association, was made a Executive at the meeting at which this action