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## The Canadian Mining Journal

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Mr. E. H. Hamilton, who for some time had been metallurgical manager for the Consolidated Mining and Smelting Company of Canada, at its smelting works and refineries at Trail, B.C., has left British Columbia, and is now with the United States Smelting Co. at Midvale, Utah.

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### FUEL AND POWER.

Fuel and power production and consumption are matters that Canadian mining and metallurgical companies are much interested in at all times. Naturally the present shortage has intensified the efforts to increase production and led to much discussion of ways and means. Among the probable results are: considerable increase in use of Canadian coal in the west; greater development of water powers; testing of peat possibilities in Ontario and briquetting of lignites in Saskatchewan. The much to be desired increase in production of coal in Nova Scotia seems far away, owing chiefly to labor shortage.

Coal mining is a big industry in Nova Scotia, Alberta and British Columbia. Power production is an important subsidiary enterprise of several metal mining and metallurgical companies. Power consumption is a failing common to all and so those companies not interested as producers are interested as consumers.

According to figures published by the Department of Mines, Canada produced 14,015,588 tons of marketable coal in 1917. We exported 1,733,156 tons and imported 20,857,460 tons.

Most of the coal imported is consumed in Central Canada, which has no coal; but is close to the Pennsylvania fields. We should, and probably will later, use water power for many of the purposes for which this imported coal is put, but it would be difficult for Central Canada to get along with less coal for heating purposes than was imported last year.

In Western Canada there is an opportunity to at once cut down our imports somewhat by utilizing Western coal more extensively. Alberta mines could supply a much larger amount than they have been able to find a market for in Canada, owing to competition from imported coal and unfavorable freight rates.

The situation in the East is very discouraging. There we have plenty of coal and yet we find that the production is decreasing instead of increasing. Lack of transportation facilities long ago prevented the Nova Scotia companies from sending the normal supply to St. Lawrence ports. The labor shortage, due to the great numbers of miners enlisting, has made it impossible to obtain the desired output.

As has been pointed out many times, it would be easily possible to mine in Alberta sufficient coal to meet all the needs of Alberta, Manitoba and Saskatchewan, if it should prove impossible to import the customary amounts from the United States. Last year less than 5,000,000 tons was produced by Alberta mines that could produce about 8,000,000 tons. Owing to lack of market, it is at present impossible to keep the mines in operation continuously throughout the year, although they are sufficiently developed to make much larger outputs and men are available.

It may seem absurd that with good coal close at hand in Alberta, the people of Manitoba and Saskatchewan should be worrying about their next winter's supply. But they have cause for worry, for unless the Canadian operators are at once given assurance that American coal will not be available, they cannot undertake to keep the mines in operation during the summer months. If the usual 3,000,000 tons of American coal is imported this year, the Alberta operators will be able to dispose of only about 5,000,000 tons, and they can produce that amount in about 7 months. If, on the other hand, the operators are not immediately given assurance that 8,000,000 tons will be needed, they will have lost time that it will be impossible to make up. If imports fail, then there will be a shortage which will be more or less acute depending on the length of time lost now.

As a great deal has been said and written about methods of utilizing the lower grade coals of the West, there seems to be a rather general impression that Alberta mines cannot supply all the needs of the Prairie Provinces. It is true that a considerable portion of the coal mined in Alberta will not store and only a very small amount is anthracite.

But there is mined in Alberta, coal suitable for all industrial and domestic purposes. The statement, often made, that Alberta coal cannot be stored is, according to John T. Stirling, Chief Inspector of Mines, true only of less than one-third of the output. Mr. Stirling in a paper presented at the annual meeting of the Canadian Mining Institute in March, said: "It is being fully demonstrated every day that railway locomotives, steam plants and buildings of all kinds and sizes can use Alberta coal in Saskatchewan and Alberta with very satisfactory results, so that there appears to be no reason why the same fuel cannot be used in Manitoba."

#### TUBE MILL PEBBLES.

In the course of explorations in Nova Scotia last summer, Mr. A. O. Hayes, of the Geological Survey of Canada, collected samples from deposits of pebbles suitable for use in tube mills, which occur in beach deposits along the shore of Gabarus Bay, Cape Breton County. Along the north shore the pebbles are derived directly and in several coves in the vicinity of Eagle Head, from the volcanic rocks which form this rugged coast, beaches thrown up well above high tide are composed entirely of pebbles of rhyolite and similar types of rocks, several thousand tons of which could be readily loaded on vessels.

At the head of the bay, a barrier bar has been formed which contains a mixture of material, including the types mentioned above, together with granite, syenite, quartz-porphry and quartzite, derived from reworked glacial drift as well as the local volcanic rocks. Many thousand tons of this material could be sorted from this beach, and loaded on vessels by means of small boats, as the water is shallow in the vicinity of this bar.

A series of careful comparative tests were made in a Deval abrasion machine on samples of rhyolite pebbles, the mixed material, and of commercial flint pebbles. In regard to resistance to abrasion, all the samples proved superior to the commercial flint pebbles.

Louisburg, the terminal of the Sydney and Louisburg Railway, is about ten miles eastward from the head of Gabarus Bay, connected by a very rough wagon road; and Sydney, the terminal of the Canadian Government railway, is about twenty miles northward, with a better wagon road.

#### NAMES OF NEW GOLD TOWNSHIPS SOUTH OF LAKE ABITIBI.

During the autumn of 1917 gold was discovered in unsurveyed territory south of Lake Abitibi in north-eastern Ontario. This area lies about 70 miles almost directly east of the well known Porcupine area.

During the coming summer the Ontario Bureau of Mines is to make a geological survey of this new gold area. Following the custom of Ontario, this area is being divided into townships, 6 miles square. These townships have recently been given the following names in honor of men well known in the mining and geological world. In alphabetical order the names are as follows:

**Frecheville**—Prof. Wm. Frecheville, Professor of Mining in the Royal School of Mines, London; past President of the Institution of Mining and Metallurgy.

**Garrison**—Mr. F. Lynwood Garrison, Mining Engineer, Philadelphia, Pa.

**Harker**—Dr. Alfred Harker, F.R.S., immediate past President of the Geological Society of London.

**Holloway**—The late Mr. George T. Holloway, Chairman of the Royal Ontario Nickel Commission, 1915-17.

**Lamplugh**—Mr. G. W. Lamplugh, F.R.S., President of the Geological Society of London.

**Marriott**—Mr. Hugh F. Marriott, President of the Institution of Mining and Metallurgy, London.

**Rand**—Mr. Chas. F. Rand, past President of the American Institute of Mining Engineers, New York.

**Stoughton**—Dr. Bradley Stoughton, Secretary, American Institute of Mining Engineers, New York.

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CORRESPONDENCE

High Grade Coals in Alberta.

Editor, Canadian Mining Journal:

Sir,—A letter, dated the 8th of February, 1918, from Kingston, Ont., having appeared in the March edition of the Canadian Mining Institute Bulletin, opens up a very important subject not indicated by the title. The writer, Mr. J. C. Gwillim, says, "We are inclined, now-a-days, to resent the alienation or private control of some of our natural resources. Yet we are, or were, least concerned about the two most vital ones, food and fuel. . . . It is left to the coal miners alone to produce enough fuel. . . . Soon we may expect to receive little or no hard coal from Pennsylvania; it is being exhausted and will be conserved by the American people."

The total coal output of Canada last year was about fourteen million tons, and our import of coal from the United States about seventeen million tons, of which four million tons was anthracite or hard coal, and the balance bituminous.

Mr. Gwillim asks where should we be if the United States stopped the exportation of coal to Canada? The present writer has recently as well as previously suggested; that very unpleasant things might happen in Canada if a serious strike occurred on the railways or at the collieries in the United States.

The above three possibilities would all be equally serious and therefore the sooner we people on the Canadian side of the line face the music the sooner will common sense place us in an independent position. We must, however, give the United States and its fuel controller our grateful thanks for the brotherly way in which this problem was dealt with during the past winter.

Western Canada possesses the most magnificent coal-fields, filled with seams of all qualities and which are in thickness also unequalled anywhere else on this earth.

Mr. John Stirling, the Chief Inspector of Mines for Alberta, in reference to the possible output of the Province of Alberta, tells us that the possible output might have been over eight million tons, whereas, it only amounted to about 4,863,414 in 1917, or 214,810 tons in excess of 1916.

A recently issued estimate of the coal resources of Canada made by Mr. White, of the Dominion Conservation Board, gave the Province of Saskatchewan credit for a store of over sixty-six billion tons of lignite. Experiments having been made by the Dominion Government, in conjunction with the Advisory Council of Scientific and Industrial Research it has been stated that they will erect a works to treat this and other lignite deposits, and convert them into coked or cindered coal, after extracting the by-products, and will finally convert them into briquettes equal to anthracite. This scheme if it works out successfully, may to some extent relieve the situation in that part of the Dominion.

Mr. White does not credit Alberta with the possession of any stores of anthracite, but he does credit that Province with 846 million tons of semi-anthracite, and 932 billion tons of sub-bituminous. As no details of these estimates are given, it is impossible to question his figures in detail. We will be satisfied for the moment to find that he credits the Province with some semi-anthracite, which for general purposes is a much more useful quality of coal than anthracite.

Now for a few facts, there are between Bankhead and to at least as far as the divide between the Kananaskis and Elk valleys, several coalfields containing the

most magnificent deposits of coal to be seen anywhere, and the writer has in mind one of these where it is probable that twelve and a half per cent. of the whole mountain is coal.

We are fortunate to have one man out here in the woolly west, W. P. Burns, of Calgary, who, recognizing the value of this vast wealth of coal, will without delay demonstrate that Alberta can supply a huge tonnage of very high grade anthracitic coal. Before the summer comes, Mr. Burns' mining staff will be at work, and his railway engineers will be as busy as bees laying a full gauge railway track from Okotoks to the Sheep Creek coal mines, a distance of about 55 miles.

To make sure that the following details of this property are correct, they have been submitted to Mr. Alexander Sharp, Mr. Burns' mining engineer.

The property is in a synclinal basin form, and is of Cretaceous age. To those who do not know its exact location it may be stated that it lies to the south-east of Mt. Rae, and to the east of the Misty range of mountains. Here Mr. Burns owns 12,000 acres of Crown granted land and minerals extending over a distance of eleven miles. Practically the whole of this area is coal bearing and at least a dozen workable coal seams have been prospected, which are all of workable size and quality.

The property lies at an elevation of over 5,000 feet above sea level, and therefore the coal will have a down grade to its markets.

A large number of analyses have been made, but the following will be sufficient to convince the sceptical that there are high class seams of anthracitic and bituminous coals in this field:

Number.	Moisture.	Volatile Combustible.	Fixed Carbon.	Ash.
4	1.00	12.5	82.00	3.5
5	1.00	12.50	82.00	3.50
7	1.00	11.10	81.10	6.00
14	1.82	11.74	82.25	4.20
17	1.20	15.30	75.25	7.25
16	2.00	25.00	70.00	3.00

No. 5 sample gave a very high result in British Thermal Units, viz., 14,877, one pound of it evaporating 15.4 lb. of water. Its high class quality will be better realized by comparing it with other anthracite coals, thus:

South Wales anthracite	14,884 B. T. Units
Burns anthracite	14,877 B. T. Units
Banff anthracite	14,000 B. T. Units
Pennsylvania anthracite	13,999 B. T. Units

If we adopt the classification of Mr. Dana, a well-known authority on coal, a good anthracite should contain from 78 to 88 per cent. of fixed carbon and, therefore, the first four analyses would show them to be anthracitic. Mr. D. B. Dowling's—President of the Canadian Mining Institute—is probably the best known of any of those used for the classification of coals, viz.:

$$\text{Fixed Carbon} + \frac{1}{2} \text{ the Volatile Combustible}$$

Moisture +  $\frac{1}{2}$  the Volatile Combustible and under this rule 15 and upwards ranks as anthracite, 13-15 as semi-anthracite, 3.5 to 6 as bituminous, and a higher class bituminous as 6 to 10. No. 16 in the above table gave a yield of 73% of coke, which in its turn gave a fixed carbon content of 94.9%.

How many hundreds of millions of tons of similar coals are to be found in this part of Alberta between the Elk divide and Bankhead it is at present impossible to say, but only railway communication and cheap freight rates are required to open it up to supply all the needs of the prairie provinces.

Although the writer has taken Mr. Gwillim's letter as his text, he does not propose to discuss costs in the way Mr. Gwillim has done; but the latter may find some comfort in the fact that the cost of working the coalfield in question is not likely to be excessive. The writer entirely agrees with Mr. Gwillim in the suggestion that the getting of coal is capable of much improvement in methods of working, which are often very wasteful.

Yours, etc.,

JAMES ASHWORTH.

Vancouver, April 11th, 1918.

#### LORD HYLTON MAKES STATEMENT CONCERNING MINERALS SEPARATION CORPORATIONS.

The Times, London, on March 14, printed the following account of a question and reply in the House of Lords concerning the Minerals Separation Corporations:

Lord Sydenham asked two questions concerning a German firm: (1) Whether the American branch of Messrs. Beer, Sondheimer and Co., of Frankfort, was blacklisted and subsequently released; and (2) what conditions were imposed when this branch of the German firm was permitted to act for a time as agents of Minerals Separation American Syndicate.

Lord Hylton, who replied, said the information which the Government had was to the effect that Messrs. Beer, Sondheimer and Co., of New York, were included in the statutory list, generally called, he thought, the black list in the United States, in July, 1916, and remained on that list until it was withdrawn on the entry of the United States into the war. It is perfectly true the Minerals Separation American Syndicate (1913) (Limited), which is a British registered company, entered into an agreement in the month of September, 1913, with Messrs. Beer, Sondheimer and Co., under which the firm were appointed the sole agents of the syndicate for the transaction of all commercial affairs of the Syndicate in the United States of America, Canada, Mexico, Cuba, and the Philippine Islands. Messrs. Beer, Sondheimer and Co. have their principal office at Frankfort, and have a branch in America carried on by Messrs. Benno Elkan and Otto Frohnknecht, who were resident and domiciled in New York City. In October, 1914, the syndicate applied to the Committee on Trading with the Enemy for leave to enter into an agreement with Benno Elkan and Otto Frohnknecht, under which the syndicate appointed them as the American branch of Beer, Sondheimer and Co., its sole and exclusive agents for the transaction of the commercial affairs of the syndicate in the places already mentioned, and Elkan and Frohnknecht undertook not to pay or to cause to be paid any money, etc., arising from or in connection with their trade relationship with the syndicate to Beer, Sondheimer and Co., of Frankfort, or any person resident in Germany or Austria, or to anyone for the use of such person during the war, and to defer until after the war any commission or remuneration payable to them. At that time Beer, Sondheimer and Co., of New York, were not blacklisted, and no authority was required by the syndicate to enable

them to enter into the proposed contract. They were informed by the Committee that there was no objection to their doing so.

In June, 1916, the syndicate approached the Treasury again. In view of their difficulties in America they had been advised to form an American Corporation to acquire from the syndicate the United States Patents and the Patents for Canada, Mexico, etc., and all their assets and other rights, but they were prejudiced by the Agency Agreement entered into with Benno Elkan and Otto Frohnknecht, the American Corporation which was proposed being unwilling to submit to the obligation to deal with them. The syndicate, therefore, proposed to invite Elkan and Frohnknecht to cancel the agreement in return for a certain number of fully-paid shares in the company and an option to subscribe at par for further shares. The shares in question were ultimately to be converted into shares in the American Corporation, and no benefit was to accrue in respect of them for five years. The substitution of a moderate shareholding interest in the company—£17,500 out of £200,000—appeared to be preferable to the control resulting from the exclusive agency under the Agreement of 1914, and, after reference to the Board of Trade, the Syndicate's proposal was sanctioned, subject, of course, to the approval of the Capital Issues Committee of the issue of shares if a new issue was involved. Meanwhile, the syndicate received from America the agreement entered into there for the formation of an American Corporation for the acquisition of its undertaking and assets, as finally settled. This agreement necessitated a modification of the proposed agreement with Elkan and Frohnknecht, putting an end to their exclusive agency. The shares which they were to receive as consideration for cancellation were to be placed at their disposal at the end of the war instead of at the end of five years, and Elkan and Frohnknecht were to be the general agents in the countries which I have mentioned, although not the exclusive agents, of the American company. On the other hand, they released to the British company the money to which they were entitled in respect of commission, which was stated to amount to from £16,000 to £20,000. The company stated that it was absolutely essential to continue this provision as to the agency, Elkan and Frohnknecht absolutely refusing to assent to its cancellation, and they pointed out that a leading American counsel had advised, in America, that the American branch of Beer, Sondheimer and Co. had no authority to enter into the new agreement or give the guarantee as to no-enemy benefit, and that the original agency agreement of 1913 was still in existence and could be enforced against the syndicate in the American Courts. Meanwhile the name of Beer, Sondheimer and Company of New York had been added to the statutory list. In all the circumstances the Treasury came to the conclusion that it was advisable in the national interest to authorize the company to enter into the agreement of August 4, 1916, with Elkan and Frohnknecht, even though their right to be appointed agents remained, rather than to leave the company under their liability of the 1913 and 1914 agreements to employ them as sole and exclusive agents, and sanction was accordingly given, so far as the Acts and Proclamations relating to Trading with the Enemy were concerned. The Capital Issues Committee subsequently recommended the issue of fresh shares, out of which inter alia the shares to which Elkan and Frohnknecht were entitled, were allotted to them.



# Canada's Water Powers and Their Relation to the Fuel Situation\*

By J. B. Challies,

Superintendent Dominion Water Power Branch, Department of the Interior, Ottawa.

At first "blush" it might appear that water power has only an indirect and limited connection with the recent critical fuel shortage, which through suspended effort has caused temporary industrial stagnation and local domestic hardships of enormous extent and involving great financial loss. Even a casual general survey of our fuel-power requirements, however, will indicate that not only has water power a very direct and important bearing on the present situation, but that water power must, in the future, take a very much greater share in our fuel-power burdens.

It is axiomatic that our heat, light and power needs must be considered as one great national problem, and also that Canada's domestic and industrial development depends primarily on the co-ordinated use of all the fuel-power resources of the Dominion.

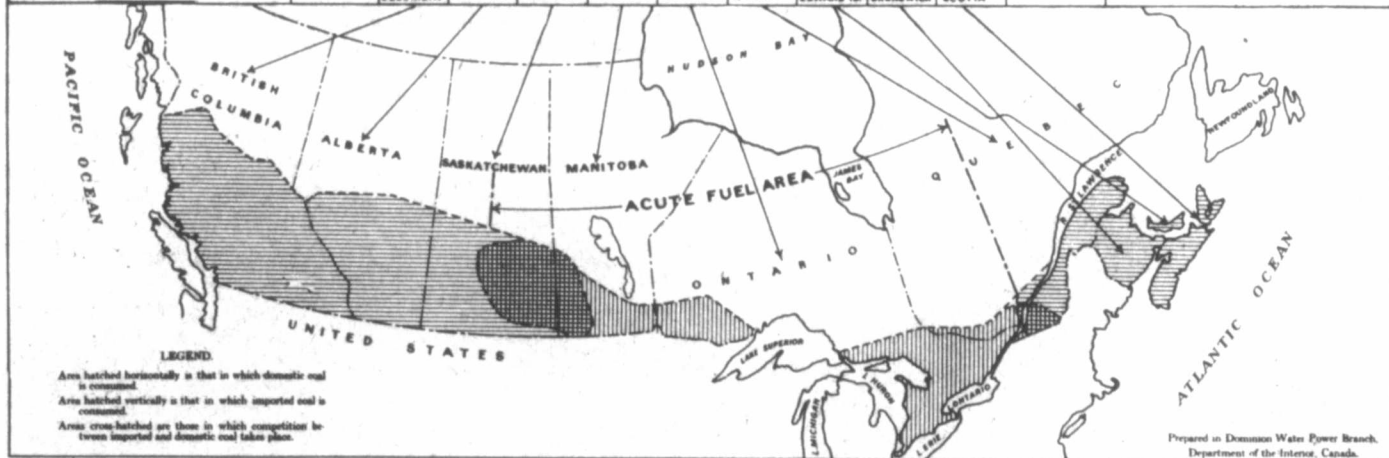
I propose to show: First—That water power must take a very prominent part, if the best use of the varied fuel-power resources of Canada is to be achieved, and Second—That there must be evolved a national master fuel-power policy which will realize the best possible co-ordinated and concomitant development and use of all the fuel-power resources of the Dominion.

## Canada's Production and Consumption of Coal.

Plate No. 1 represents the coal consumption and production in Canada. The tabulated statement on the top of the plate summarizes the consumption in the various provinces of the different classes of coals, both domestic and imported. The greatest consumption is in central Canada, including the provinces of Manitoba, Ontario and Quebec. Coal production is greatest in the extreme western and eastern provinces. British Columbia and Alberta on the one hand and Nova Scotia

Coal Consumption and Production in Canada.

SOURCES OF DATA	CONSUMPTION	BRITISH COLUMBIA	ALBERTA	SASKATCHEWAN	MANITOBA	ONTARIO	QUEBEC	PRINCE EDWARD IS.	NEW BRUNSWICK	NOVA SCOTIA	GRAND TOTALS	REMARKS	
This data obtained from: Alberta. Dept. of Public Works, Annual Report, 1918. Albert. Dept. of Mines, Quarterly Bulletin, 1917. British Columbia. Bureau of Mines, Annual Report, 1918. Canada. Dept. of Mines, Mine Branch, Production of Coal & Oil in Canada, 1918. Canada. Dept. of Customs, Annual Report, 1915-16. New Brunswick. Green Land Dept., Annual Report, 1915-16. Nova Scotia. Dept. of Public Works and Mines, Annual Report of the Mines, 1915-16. U.S. Geological Survey, The Coal Fields of the United States, 1917. (Professional Paper 100-A). U.S. Geological Survey, Coal in 1915 (Part A, Production; Part B, Distribution and Consumption, 1911).	<b>Domestic</b>											This compilation is based on 1916 figures. Consumption urban being somewhat inflated because 2,000,000 tons, or about 1/3 of the consumption in railway coal, and so much is carried from province to province as traffic necessitates.  Remarks: (1) Are from Mines and other reports of previous years compiled. (2) Are from combinations of reports of previous years considered. (3) Are calculated, allowing the tonnage according to population and known consumption, both imported and domestic; deductions and additions being made accordingly for domestic and imported tonnage in order to arrive at a reasonable figure. These figures cannot be obtained direct from any Government report.  Differences in totals are accounted for partly by using arbitrary figures in some cases for purposes of tabulation and by different methods of tabulation and statistics.  NOTE: Some data obtained and collected by Mr. J. J. Brown, Mining Engineer.	
	Anthracite	10,342	112,130	28,297	1,658	—	—	—	—	—	—		
	Bituminous	1,311,435	1,851,832	140,413	17,719	—	994,244	82,224	891,031	2,826,300			
Lignite	21,142	959,522	1,134,342	79,232	—	—	—	—	—	—			
<b>Total Domestic</b>	1,343,120	3,024,489	1,302,956	96,599	—	994,244	82,224	891,031	2,826,300	10,701,530			
<b>Imported</b>													
Anthracite	—	Small	208,000	325,000	2,242,574	1,794,410	—	Small	Small	—			
Bituminous	—	Small	718,878	1,27,992	6,458,102	4,174,850	—	—	—	—			
<b>Total Imported</b>	—	Small	926,878	1,52,992	8,701,979	5,969,260	—	Small	Small	17,580,603			
<b>Total Consumption</b>	1,343,120	3,024,489	2,229,835	2,051,627	8,701,979	6,964,204	82,224	891,031	2,826,300	28,282,133			
<b>Total Production</b>	2,584,061	4,559,956	281,300	—	—	—	—	143,540	6,812,140	14,480,095			
<b>Production over consumption</b>	1,240,941	1,535,467	—	—	—	—	—	—	4,085,840	—			
<b>Consumption over production</b>	—	—	1,948,535	—	—	—	—	747,491	—	—			
<b>Consumption no production</b>	—	—	—	2,051,627	8,701,979	6,964,204	82,224	—	—	—			
		BRITISH COLUMBIA	ALBERTA	SASKATCHEWAN	MANITOBA	ONTARIO	QUEBEC	PRINCE EDWARD IS.	NEW BRUNSWICK	NOVA SCOTIA			



Development along independent and divergent lines has, in the past, prevented adequate correlation of the great Canadian industries of fuel production and hydro-power supply. There is now, however, as a result of the fuel shortage, a consensus of opinion among men familiar with fuel and hydro-power matters in Canada, that there is between these allied industries enormous scope for national co-operation which would be conducive to their mutual advantage, as well as to the common weal.

on the other not only meet their own coal requirements, but produce a very considerable overplus for consumption in the contiguous portions of Central Canada. The central provinces, Manitoba, Ontario and Quebec, are almost wholly dependent on outside sources, mainly imported coals. This is clearly shown by the hatched areas on the map, the horizontal hatching covering the areas which produce their own needs, the vertical hatching covering the areas which are dependent. Where there is cross-hatching both Canadian and imported

\*Extracts from a paper presented at the First General Professional Meeting of the Canadian Society of Civil Engineers for the discussion of the Present Fuel and Power Situation, Toronto March 26-27, 1918.

coals are consumed. It is to be observed that Central Canada, where consumption is greatest, is non-productive. This I have termed the "acute fuel area" of Canada.

**Canada Imports Coal and Exports Coal and Electric Energy.**

This "acute fuel area" is now dependent for domestic requirements mainly upon Pennsylvania anthracite and for industrial needs upon American bituminous coals, as well as upon Canadian water power. So far as domestic heating requirements are concerned, Mr. Dick, the Consulting Mining Engineer of the Conservative Commission, in his paper on the "Rational Development of Canadian Coal Resources" has pointed out the possibilities of the Western portion of the "acute fuel area" being furnished with briquetted lignite from the prairie provinces. Mr. Stansfield of the Dominion Mines Branch, in his paper on "The Low Temperature Carbonization and Briquetting of Bituminous Coal," has pointed out the possibilities of meeting the domestic heating requirements of the Eastern portion of the "acute fuel area" by the product from the low temperature carbonization of Nova Scotia bituminous coals. Although both these processes are proven to be practicable, they are as yet in their formative or agitational stage and some considerable time must elapse before

they can be placed on a commercial basis to furnish sufficient fuel to substitute for any large portion of the Pennsylvania anthracite now imported for domestic heating. There is at the present time no available supply, even in small quantities, of a Canadian coal fuel to take the place of imported anthracite. Nevertheless, this "acute fuel area" can eventually be made independent of foreign fuel imports and Canada can become self-sustaining, at any rate, in respect of her domestic heating requirements. There must, as a necessary preliminary, be a national, co-ordinated development and use of all the available fuel and power producing agencies in the Dominion. Such a co-ordination must be a matter of gradual evolution and adoption, and will, to a great extent hinge on whether Canada can reasonably expect assured fuel imports from the United States for a considerable period in the future.

As we are now exporting large quantities of coals from British Columbia and Nova Scotia into adjacent States of the Union and as we are also exporting about 275,000 horse power of electric energy, equal in value to about 3,000,000 tons of coal, it is obvious the United States cannot afford to place a sudden and complete embargo on coal exportation to Canada. The two countries must deal with each other, at least, upon a basis of quid pro quo. Providing Canada has her own fuel resources under strict national control, this power exportation should assure her an importation of sufficient coal to tide over any readjustment period necessary to permit of an ultimate dependence on Canadian sources of fuel and power.

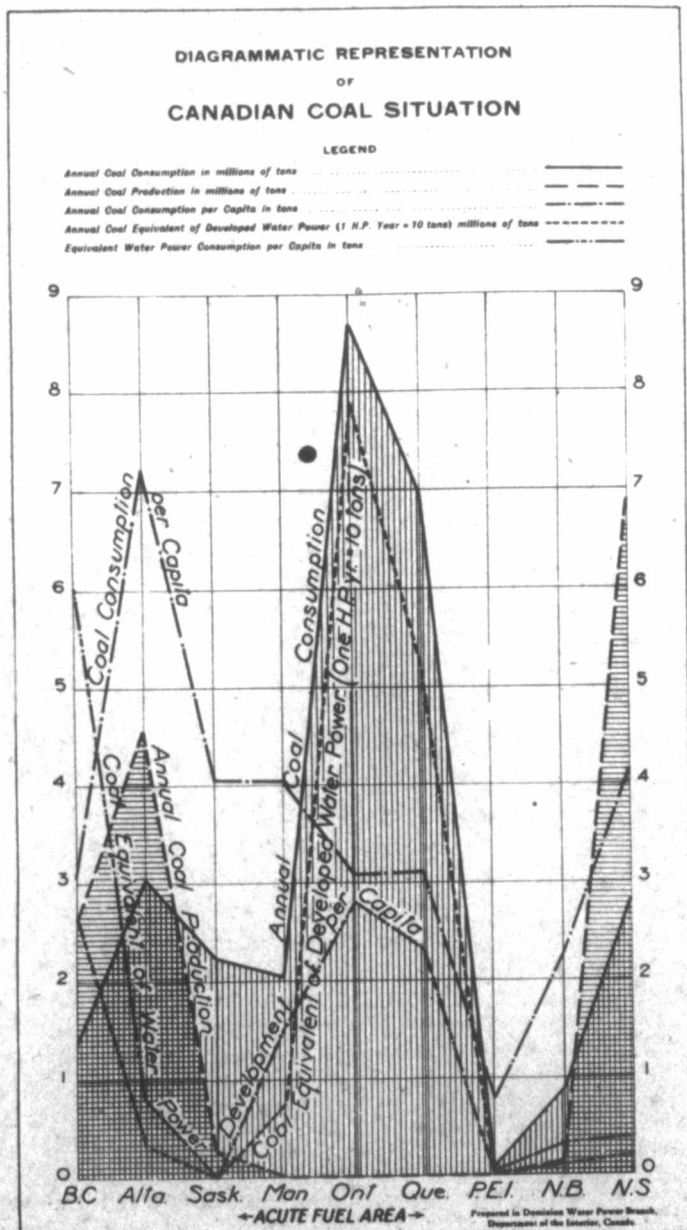
The exportation in the past of Canadian electric energy has not been without compensating advantages. An assured United States market for Canadian power loads has enabled the financing and completion of several hydro-electric projects, the construction of which, so far as domestic markets alone are concerned, would not have been warranted at the time. The initial United States power load has, therefore, made it possible for the domestic market to reap all the benefits of available hydro-electric energy many years sooner than otherwise would have been possible.

While Canada has been receiving far more value in her coal importation than she has given in her power exportation the advantage is rapidly disappearing. It is reasonable to expect that the tendency will be for hydro-power exportation to increase and for coal importation to decrease. The time may come, and in the near future, when the balance will be against Canada.

It is, therefore, imperative that every proposal for increase in the exportation of power be carefully considered from a broad, national standpoint. Such consideration involves the evolution of a formula with regard to power exportations which will have cognizance of Canada's fuel-power needs generally.

We must face the fact that for some time to come we shall require to import United States coal, and that in turn therefor we can, under proper conditions of recovery safely and profitably export some of our surplus hydro-electric energy.

Mr. B. F. Haanel, Chief of the Fuel-Testing Division, Department of Mines, in his clear and comprehensive paper on the "Fuels of Canada," describes the nature, location and extent of our varied, available fuel resources. Mr. Haanel affirms that, while the problems associated with the distribution of fuel to the various parts of Canada are exceedingly complex and the strictest conservation must be practised, the Dominion is endowed with fuel deposits on such a magnificent





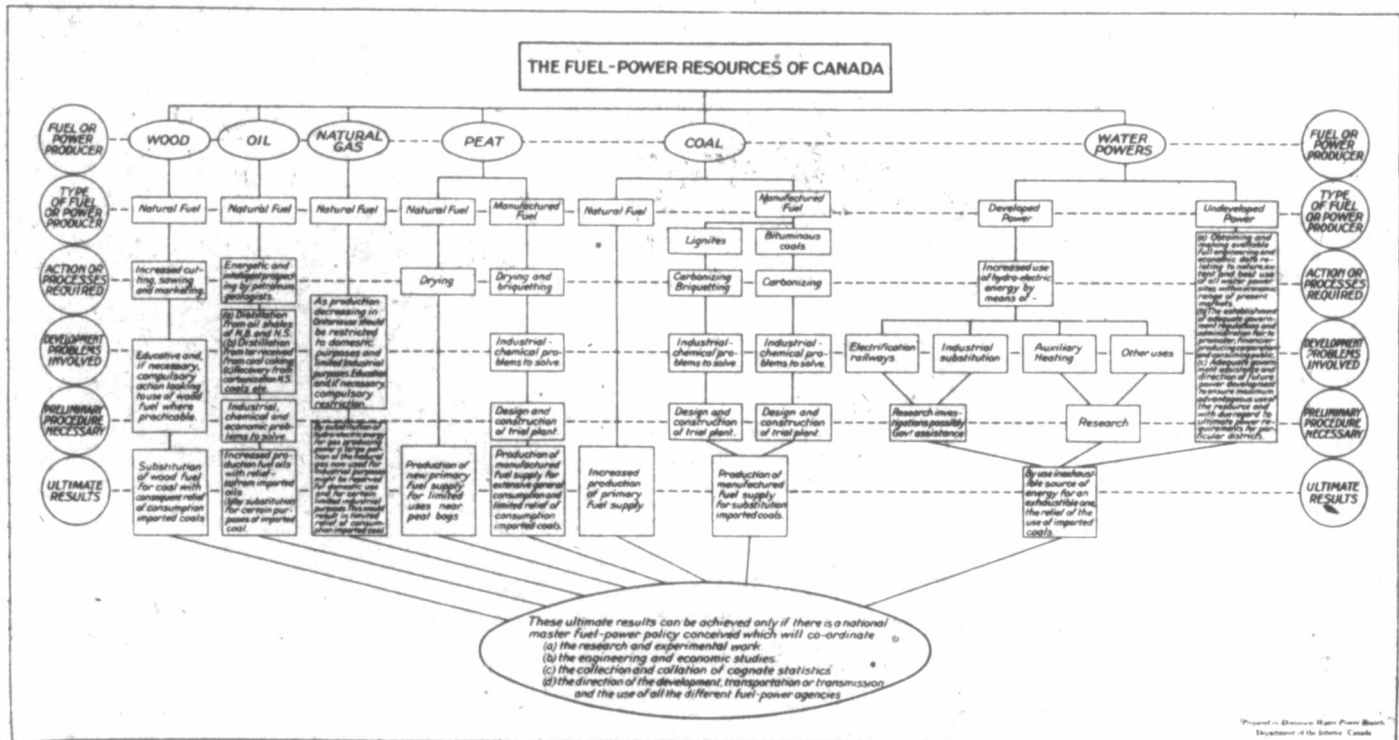
scale that all that is necessary is their proper exploitation and economic use for the country to be eventually practically independent of foreign sources of fuel. Mr. Haanel is particularly emphatic that Canada need not go abroad for fuel for household use, if her own fuel resources are properly exploited.

The problem of Canada's fuel needs outside of the "acute fuel area" offers little difficulty, owing to an abundance of both coal and water power. It is simply a matter of efficient and effective use of available resources. Within the "acute fuel area," however, the problem is pressing and prodigious. It resolves itself into two parts, first, provision for domestic or household heating consumption; second, provision for industrial requirements.

less, be seriously considered. Water power will be the main means of such substitution. The industrial fuel problem, therefore, in the "acute fuel area" becomes largely a matter of substitution of hydro power for fuel power.

Electrification of railways—especially terminals with adjacent engine divisions—would save enormous consumption of bituminous coal and relieve our transportation systems of their greatest burden.

It is estimated that something like 9,000,000 tons of coal was consumed by our railroads in the year 1917. Judging from the results obtained from the electrical operation of railroads in the United States, it would be possible to save at least two-thirds of this coal if electric locomotives were substituted for the present steam locomotives.



**Substitutes for Anthracite for Domestic Needs.**

The requirements for fuel for general household use are, at the present time, furnished by American anthracite; over 4,000,000 tons were used in 1916. Competent experts declare the anthracite coal fields of the United States are in measurable distance of exhaustion and that the supply will not last a hundred years. Having in mind the ever-increasing demands within their own borders for this fuel and the rapid decrease in quality as the supply becomes exhausted, responsible fuel advisers of the United States Government have seriously urged the establishment of an embargo against exportation of anthracite. We in Canada must realize that our supply of this fuel may be gradually restricted. It is, therefore, essential that we, without delay, consider what can be accomplished in the production of a suitable substitute for United States anthracite.

**Substitution of Hydro Power for Coal.**

The industrial requirements are now met by Canadian hydro power and United States bituminous coal. About 14,000,000 tons were consumed in 1916 for this purpose in the "acute fuel area."

Owing to the large reserves of bituminous coal in Pennsylvania, this class of fuel will probably be available to the "acute fuel area" of Canada for many years. Although not immediately necessary, the ultimate substitution of bituminous coals must neverthe-

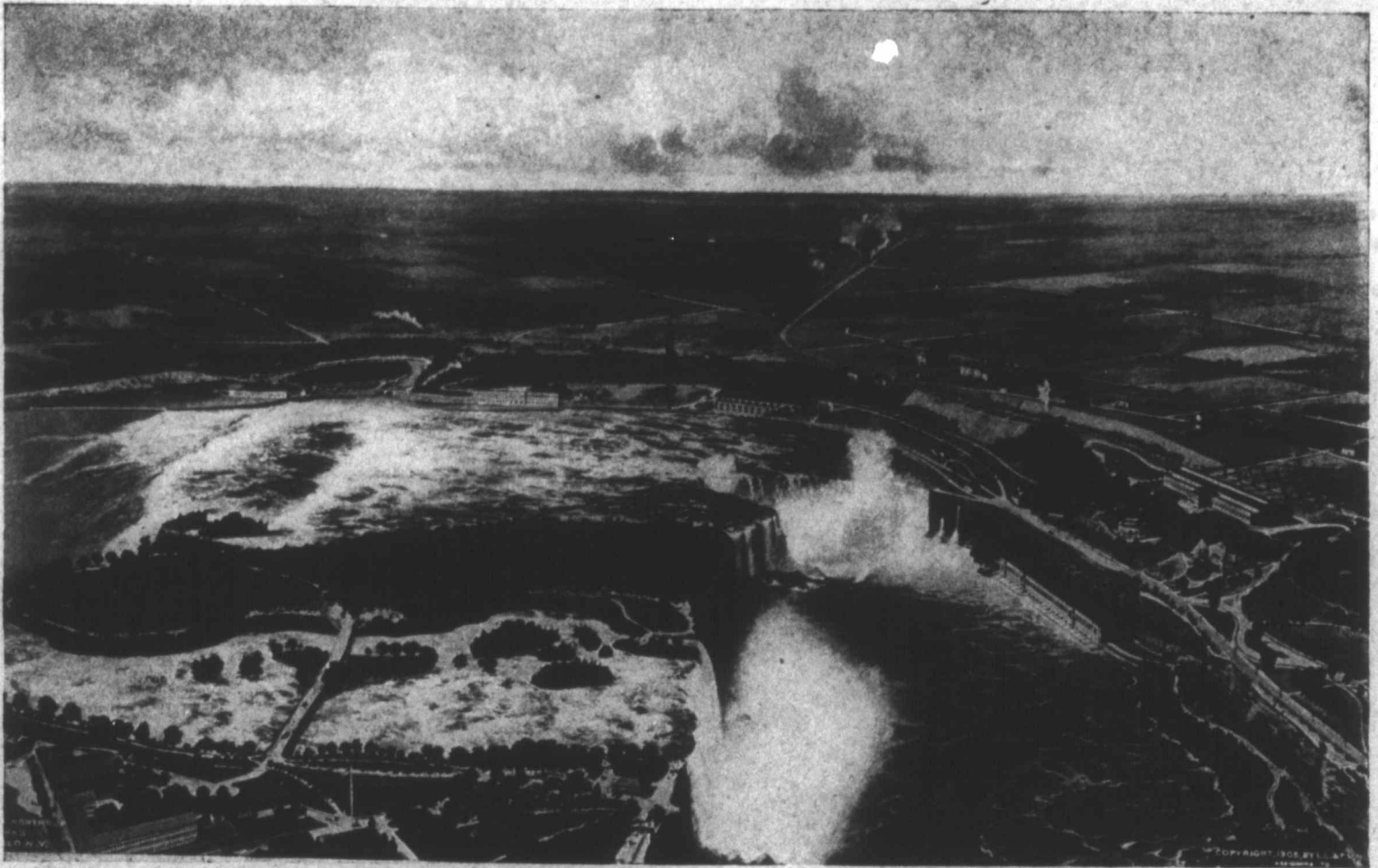
This would be a saving of 6,000,000 tons of coal in one year, and would require about 900,000 water horse power.

Electrification of steam roads at this juncture is not advocated. Under normal conditions, however, and in certain districts, as in western Ontario, electrification will become an economic necessity in a few years.

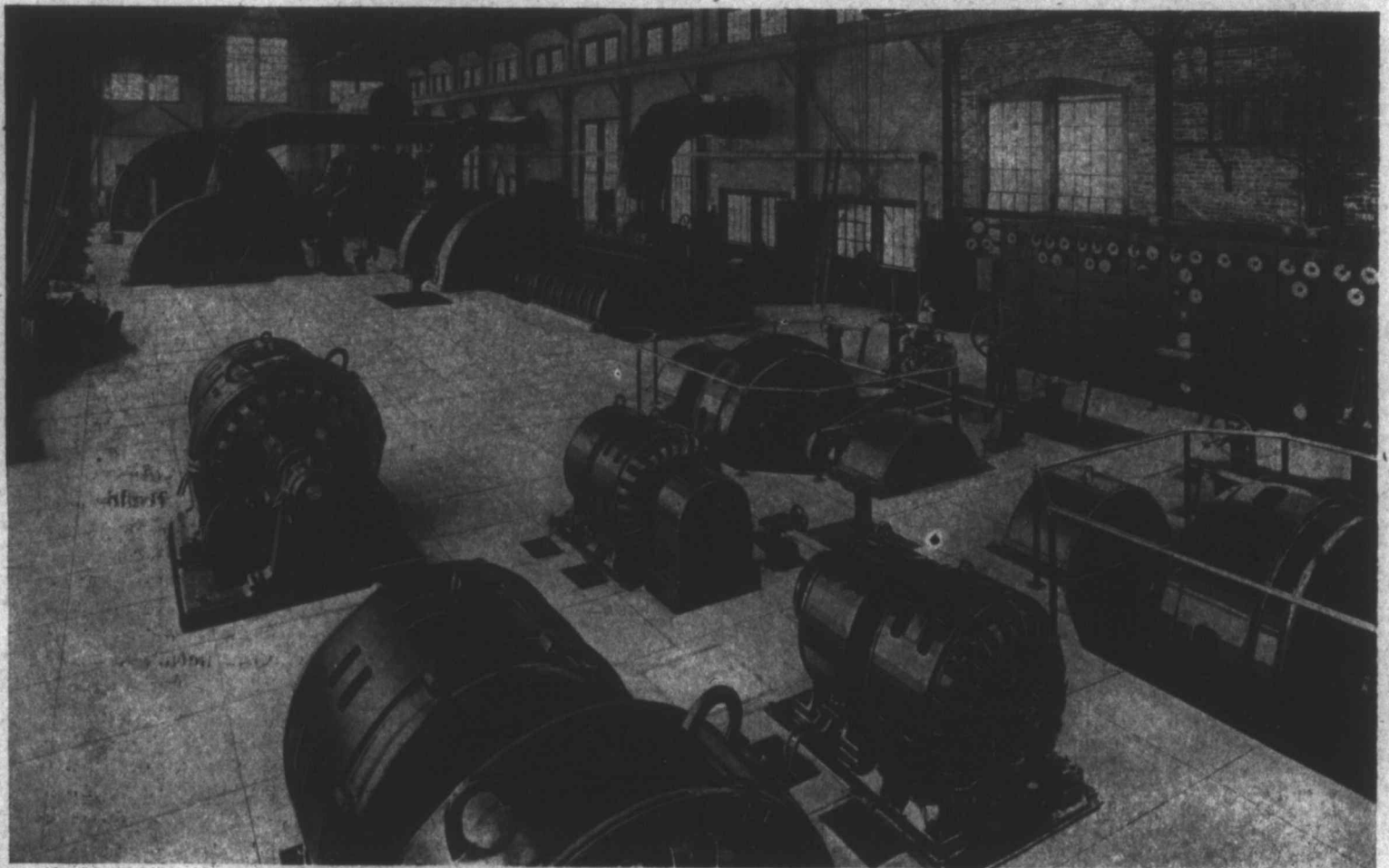
In districts that cannot be served by water power, the location of modern, efficient, super-power stations at strategic points, with a resultant elimination, or combination, of many inefficient small stations, would cause a very large saving in the consumption of soft coal, with a concurrent increased production of power.

The substitution in industry generally of hydro power for steam fuel power, would also result in a tremendous relief. There are many plants where such an exchange would be possible now. Future manufacturing plants should be encouraged to locate where hydro power is available.

The relation between developed water power and the coal production and consumption in the various provinces is represented on Plate 2. It is interesting to note that in the "acute fuel area" there is about as much water power developed, so far as coal value is concerned, as there is coal consumed. It is portentous that the bulk of our water power production at the present time is within the "acute fuel area," and it is

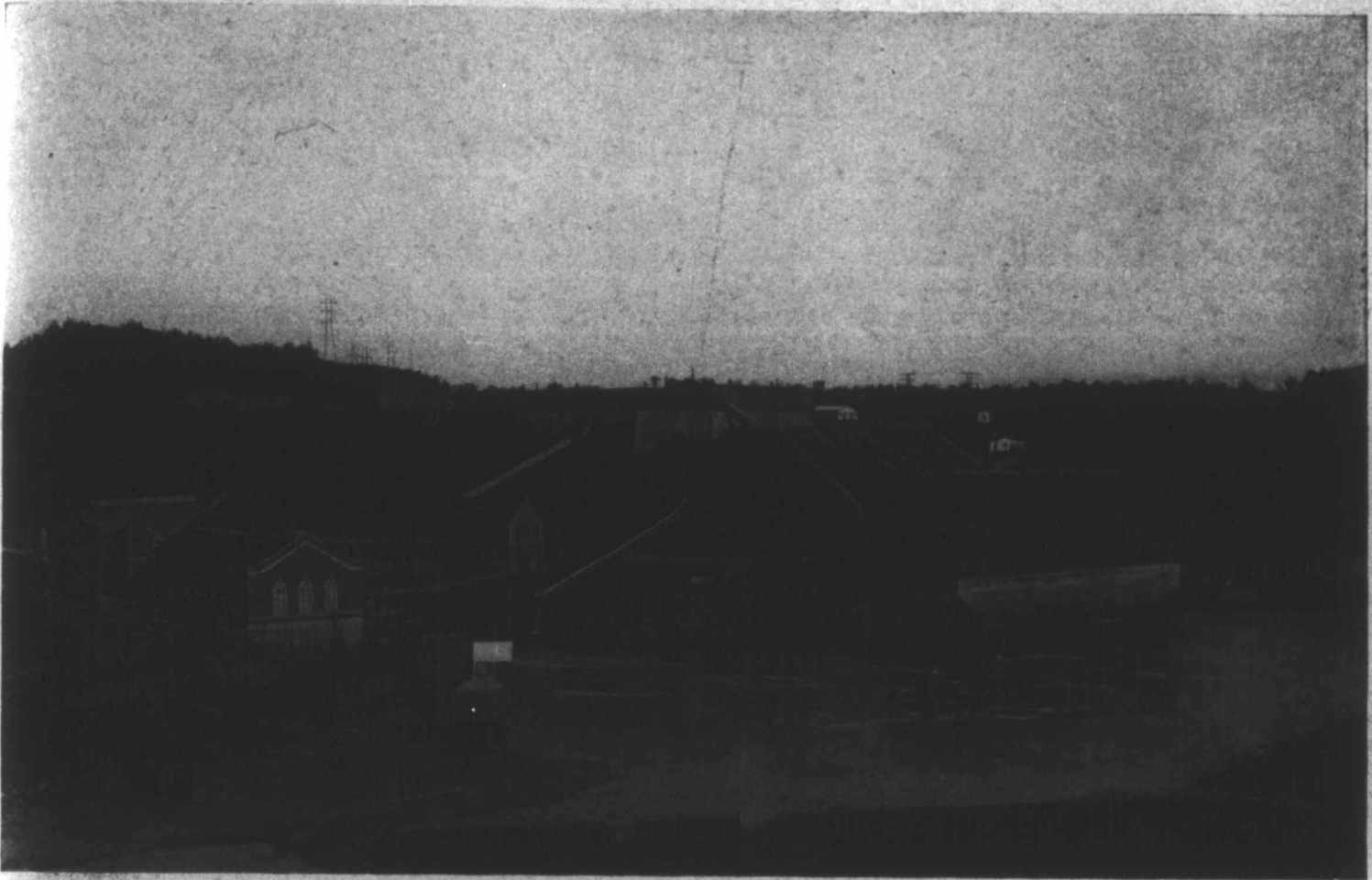


Niagara Falls, Showing Development on Canadian Side.



Power Plant of Granby Consolidated Mining, Smelting and Power Co., British Columbia.





Power Development at Shawenegan Falls, Quebec.



Hound Chute Power House, Montreal River, Cobalt District, Ontario.

WATER POWER IN EUROPE AND NORTH AMERICA

Dominion Water Power Branch Estimate 1915 (slightly revised)

Country	Area Sq. miles.	Population latest available figures.	H.P. Available	H.P. Developed	Per cent utilized	H.P. Available per sq. mi.	H.P. Developed per sq. mi.	H.P. Per Capita	
								Available	Developed
U.S.A.	2,973,890	98,783,300	28,100,000	7,000,000	24.9	9.4	2.35	0.28	0.071
Canada A	2,000,000	8,033,500	18,803,000	1,735,000	9.2	9.4	0.87	2.34	0.216
Canada B Populated	927,800	8,000,000	8,094,000	1,725,000	21.3	8.7	1.86	1.01	0.216
Austria-Hungary	261,260	51,173,800	6,460,000	566,000	8.8	24.8	2.17	0.13	0.011
France	207,500	39,601,500	5,557,000	1,100,000	11.6	26.8	3.14	0.14	0.016
Norway	124,130	2,391,780	5,500,000	1,120,000	20.4	44.3	9.02	2.30	0.468
Spain	190,401	19,588,700	5,000,000	440,000	8.8	26.3	2.31	0.26	0.022
Sweden	172,960	5,522,400	4,500,000	704,500	15.6	26.0	4.08	0.81	0.127
Italy	91,400	28,601,000	4,000,000	976,300	24.4	43.8	10.7	0.14	0.034
Switzerland	15,976	3,781,500	2,000,000	511,000	25.5	125.2	32.0	0.53	0.135
Germany	208,800	64,926,000	1,425,000	618,100	43.4	6.8	2.96	0.02	0.010
Great Britain	88,729	40,831,400	963,000	80,000	8.3	10.9	0.91	0.02	0.002

SOURCE OF INFORMATION: The basis of the table is the paper by M. Arthur Survelet, Consulting Engineer, Montreal, read before the Canadian Society of Civil Engineers. Subsequent information obtained by Mr. H. E. M. Keith and Mr. A. M. Beale, of the Dominion Water Power Branch, is incorporated. The table is not absolutely correct, but indicates a reasonable summary of the situation.

reassuring to know that our largest and most important potential water powers are located within transmission range of present congested industrial districts within the "acute fuel area."

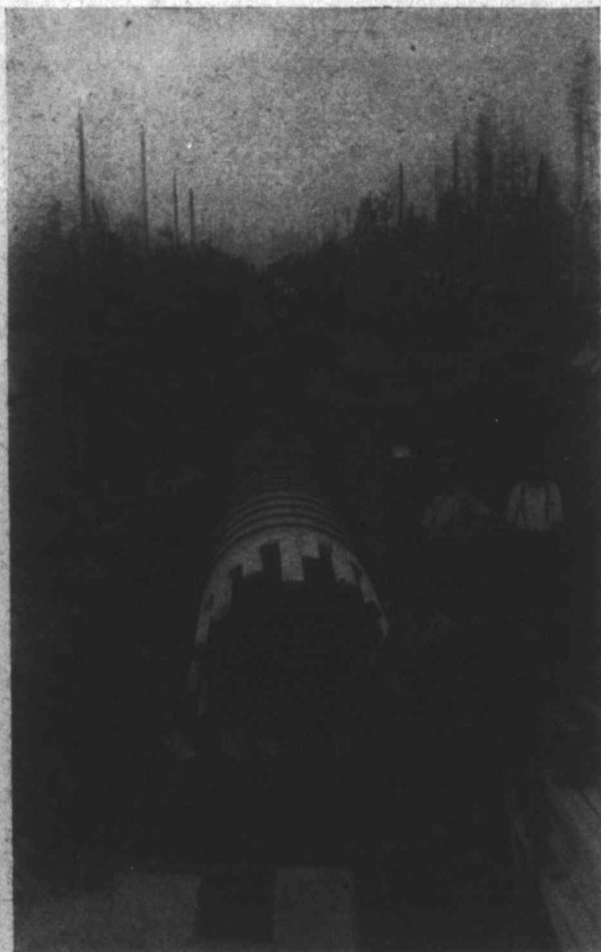
When considered in retrospect the production of hydro power in Canada has undoubtedly been an industrial achievement and an engineering triumph worthy

of our nation. In the short space of about twenty-five years, there has been developed and put in use, nearly 1,800,000 water horse power. A tabulated statement (see Plate No. 3) of the water power development in other countries, compiled recently from all available data, shows the universal importance of this resource and indicates the splendid comparative position Canada enjoys in both potential and developed water power. The present per capita power development in Canada is larger than all other countries except Norway. It is the same with respect to our known undeveloped water power. No country enjoys to a greater degree the benefits of cheap, dependable hydro power, and no country has had these benefits more universally applied for municipal, industrial and domestic use.

Fortunate Location of Our Water Powers.

The outstanding feature of the water powers of Canada is their fortunate location with respect to existing commercial centres. Within economic transmission range of practically every important city from the Atlantic to the Pacific, except those in the Central Western Prairies there are clustered water power sites, which will meet the probable demands for hydro-power for generations. The following table, prepared by the Dominion Water Power Branch indicates, reasonably accurately, the provincial distribution of the developed and undeveloped water powers within the settled portions of the Dominion.

Province.	Power Available.	Power Developed.
Ontario	5,800,000	789,466
Quebec	6,000,000	520,000
Nova Scotia	100,000	21,412
New Brunswick	300,000	13,390
Prince Edward Island	3,000	500
Manitoba	3,500,000	76,250
Saskatchewan		100
Alberta		32,860
British Columbia	3,000,000	269,620
Yukon	100,000	12,000
<b>Total</b>	<b>18,803,000</b>	<b>1,735,598</b>

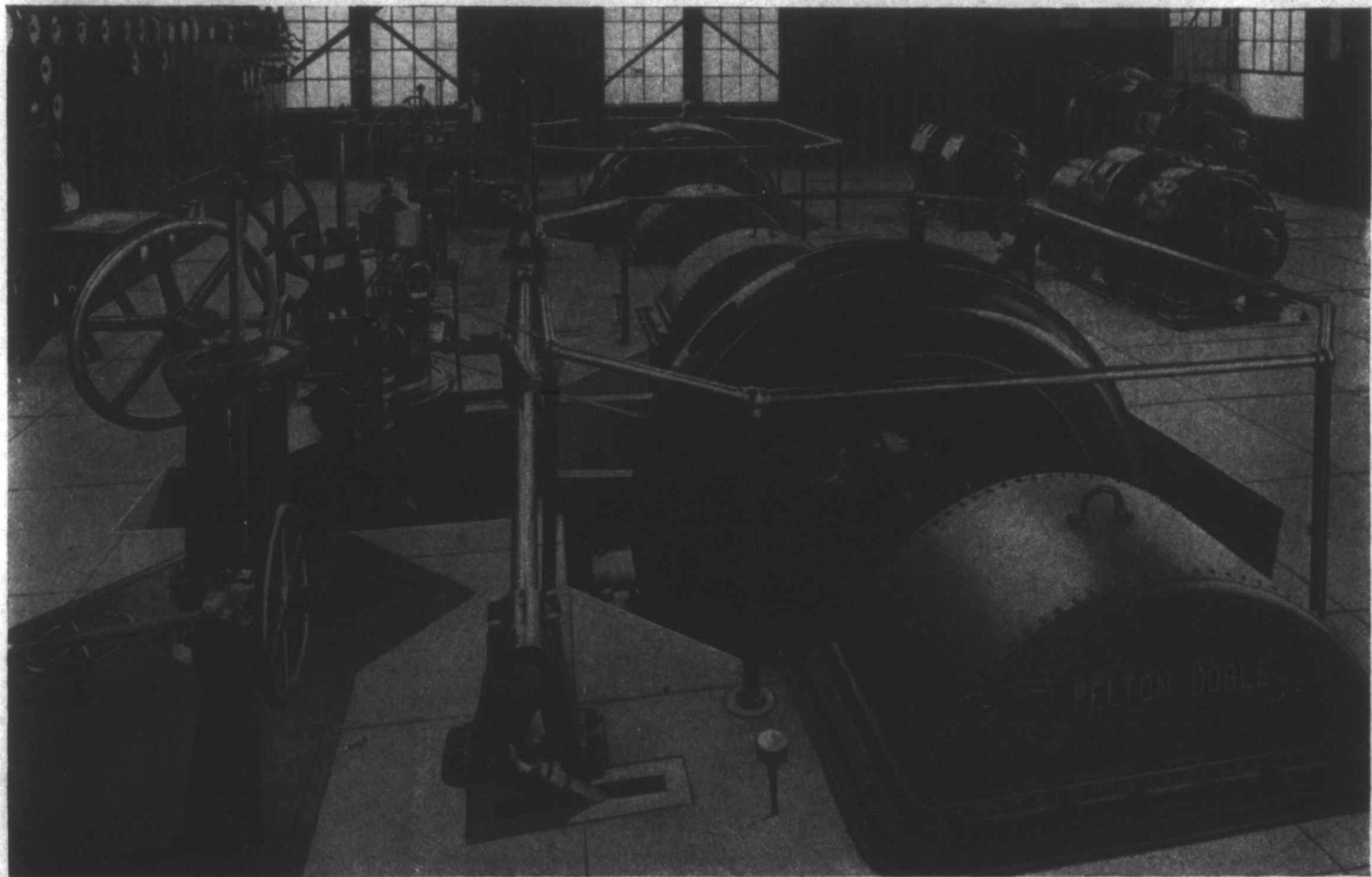


Canadian Collieries (Dunsmuir) Ltd. Wood Stave Pipe near Power House.





Chaudiere Falls, Chaudiere River, Quebec.



Power House, Granby Consolidated Mining, Smelting and Power Co., B.C.

To visualize the interdependence and interrelation of all the fuel-power agencies available in Canada, and to offer something as a basis for general discussion, I have prepared a chart (Plate No. 4). If the chart indicates any one thing it conclusively proves the immensity and complexity of the problems involved in effecting the co-ordinated, concomitant development and use of all our fuel-power resources. The chart shows that this can be best realized following the evolution of a national master fuel-power policy for all of Canada.

Cheap power promises to be one of this country's greatest assets in the post-bellum industrial rivalry of nations for world trade. Our great fuel reserves, supported by our water power resources, represent a sure source of cheap power, and should guarantee Canada her share in world trade, if our varied fuel-power resources are availed of to their maximum possible advantage.

### Conservation in Use of Coal

In the discussion of a paper presented at the New York meeting, Feb. 1918, of the American Institute of Mining Engineers, Edwin Ludlow, of Lansford, Pa., said in part:

For the first time in our history it has become the duty of the coal operator not only to practise the conservation of his own resources, but to preach conservation in the utilization of coal, by obtaining its full heat value. Coal operators in the past have been more interested in trying to mine coal at a cost that would enable them to keep their balance on the right side of the ledger, than in studying the full extraction of their coal resources. If they had done so in the past, only in favorable situations would it have been possible to mine and sell the coal in the competitive markets at a price that would return the cost of production. With the advance of prices and the demand for coal in excess of production, which is liable to last for many years, operators can now study more intensive methods for the complete extraction of the contents of their coal seams, with the security that their additional outlay and their higher costs will still net them a fair return on their investment.

With the higher cost of coal, it has also become a strong inducement for the manufacturer to pay closer attention to the results obtained from his boiler houses. In the past, coal has been so cheap that very little attention has been paid to scientific methods of firing, and to the full utilization of the B.t.u. in the coal purchased. A large manufacturer not long ago assured me that he was very particular about the purchasing of his coal, and insisted that all coal must be up to a standard of 14,600 B.t.u. In looking over his steam results, I called his attention to the fact that his coal should show an evaporation of 11 lb. of water per pound of coal, but that he was actually obtaining only 9 lb., and that by proper firing he would make a saving of at least 20 per cent. in the quantity of coal he used.

In a large number of cases that I have had occasion to investigate, it has been found that the fireman is really the arbiter of the quality and quantity of coal that is to be used, and that his methods of utilization are usually far from scientific.

It becomes the duty of coal men, when the opportunity offers, to call the attention of their customers to the conditions in their boiler rooms and point out to

them how their consumption of coal can be decreased by more economical methods of firing and better boiler practice.

Recent development of large power plants located at the mines, for the generation of electricity and its transmission to distant places, points to the most available method for the utilization of a great deal of inferior coal now thrown away at the mines, or not now mined, that could still be economically used under proper boilers if no transportation charges were added to the cost of this fuel.

This plan has already been put in practice in the anthracite region for the utilization of the finer sizes that have heretofore been considered too small to be economically used under boilers, and approximately three to four million tons of fine coal is being thrown away each year at the anthracite mines. Briquetting permits the transformation of this fine coal into a domestic fuel equal, for many purposes, to the best grades of anthracite.

These large electric plants are now burning the finest size buckwheat, which was formerly unsaleable, and are able to obtain a 200 per cent. rating on their boilers, and are sending out electricity at 110,000 volts to a radius of 75 miles. By doubling this voltage, it is estimated by electrical engineers that electricity can be sent at a less cost than fuel can be shipped to a radius of 200 miles, which would include Philadelphia and New York. The electric power required in these cities, instead of being manufactured at these points, could be more economically manufactured at a large central station located in the anthracite field. This development would relieve a tremendous congestion on the railroads in the handling of the fuel needed for these large electric plants in the cities, and would be utilizing a grade of fuel that has heretofore been largely thrown away at the mines. The accumulation of this class of material in the anthracite region amounts to at least 25,000,000 tons, and is being added to each year at the rate of 2,000,000 to 3,000,000 tons.

In the general production of anthracite, the Pennsylvania fields have probably reached their maximum, with very little virgin territory left to be developed, and no large increase can be expected in the output of anthracite coal for the future from the Pennsylvania fields, except by the utilization of what is now being wasted.

Mr. Chas. W. Goodale, vice-president, and Mr. Bradley Stoughton, secretary of the American Institute of Mining Engineers, have been visiting the Northwest, paying an official visit to local sections of the Institute in several cities. In Montana, they attended meetings at Butte and Anaconda, and in Washington, at Spokane and Seattle; they were cordially welcomed by members in all those cities.

Mine fatalities in British Columbia for the first quarter of the present year totalled five, compared with seven in the corresponding three months in 1917, according to the quarterly statement just issued by the Chief Inspector of Mines. Two occurred in coal mines and three in metalliferous mines, compared with one in the former and six in the latter last year. The coal mine fatalities occurred, one at the Michel colliery and the other at the Coal Creek colliery, of the Crow's Nest Pass Coal Company. Two of the fatalities in the metalliferous mines occurred at the Anyox mine of the Granby Company, and the third at the Florence mine in the Ainsworth division of West Kootenay district.



# Alberta Mines Can Supply all Coal Needed in Prairie Provinces

By John T. Stirling.

The amount of coal produced in Alberta during 1917 was 4,863,414 tons, exceeding that of 1916 by 214,810 tons, notwithstanding the fact that the production during the year 1917 was considerably interfered with owing to labor troubles and lack of railway facilities in certain districts.

If the mines had worked steadily throughout the year with the present labor employed and the present amount of development, the amount of coal produced would have been approximately 8,000,000 tons or more than 3,000,000 tons in excess of the amount actually produced.

The importance of this will be readily understood when it is remembered that over 3,000,000 tons of coal imported from the United States was consumed in the provinces of Manitoba, Saskatchewan and Alberta, territory which should be entirely supplied by the production from the Alberta mines. It might, therefore, be very well asked why it should be necessary to import into Western Canada at the present time over 3,000,000 tons of coal per year, particularly at a time when the operation of munition plants and other essential industries in the United States and Eastern Canada is being very seriously interfered with owing to lack of fuel. Is it not absurd that such a condition of affairs should exist or be allowed to exist?

Not only can there be more than sufficient fuel produced from the Alberta mines to supply the demands existing, or likely to exist in the prairie provinces, but in addition a sufficient amount can be produced to supply that part of the United States immediately to the south of us. It is being fully demonstrated every day that railway locomotives, steam plants, buildings and blocks of all kinds and sizes can use Alberta coal, in Alberta, Saskatchewan and Manitoba with very satisfactory results, so that there appears to be no reason why the same fuel cannot be used entirely throughout these provinces, including Winnipeg.

The statement has been made on various occasions that Alberta coal will not store. While this may be true to a certain extent regarding 25 or 30 per cent. of the output produced, it is not true of the other 70 or 75 per cent.

It is hardly reasonable to expect that while the United States is cutting down her industries to a minimum she will continue to supply fuel to Canada, more particularly Western Canada, when there is a supply in Western Canada more than sufficient to cover all demands. It might, therefore, be expected that Canada will be able to rely less and less on the coal supply from the United States.

In the first place it is not to be expected that American manufacturers will submit quietly to coal being exported to Canada while their own industries are idle for days at a time owing to lack of fuel. Up to the present time they have shared and shared alike; but already complaints are being received and it is not in the least surprising to learn that the Deputy State Fuel Administrator for New York is criticizing the actions of shippers and producers in sending coal to Canada at a time when the industries throughout that State are being considerably interfered with owing to lack of fuel required to fulfil war contracts.

Although a large surplus of coal exists in Alberta, it is necessary that some action should be taken in order to make the plan of distribution more satisfactory.

The greatest demand comes in the fall and winter months, at a time when the difficulties of operation are greatest, owing to scarcity of labor and lack of railway facilities, as the railways during those months are busy moving the crops and it is difficult to get a sufficient amount of rolling stock for the shipment of coal.

In January, 1917, 8,550 men were employed in connection with the mining industry in Alberta, while in June this number was reduced to 3,091 and again increased to 9,812 in December. The overhead charges run on just the same, thus causing a very considerable loss. No industry can be built up in this manner on a permanent basis and it remains for some authority to institute some system that will utilize this enormous force that is at present going to waste.

It has been suggested on several occasions recently that the Ontario forest reserves should be cut down for the purpose of supplying fuel, although there is an excess supply of fuel to the extent of several millions of tons in Alberta coal mines and complete facilities there for its production. It has also been suggested that Alberta coals have not been used in greater quantities in Saskatchewan and Manitoba because greater profits have led the dealers to push the United States product in preference to that of Alberta.

The development of the coal mining industry in Alberta along the lines suggested above, means that instead of the Western provinces paying Pennsylvania coal operators and transportation companies nearly \$18,000,000 for coal in the year 1916, this money would have been kept in Canada. Had the Alberta coal fields been properly developed and a market found for the product in Canada, we would have been about \$18,000,000 better off in our trade balance.

MONTHLY PRODUCTION OF COAL IN CANADA BY PROVINCES\*, 1917.  
(In short tons.)

Month	Nova Scotia	New Brunswick	Saskatchewan	Alberta	British Columbia	Total
January.....	533,111	17,144	37,693	489,727	187,396	1,265,071
February.....	468,589	16,634	27,890	445,011	208,884	1,167,008
March.....	485,864	17,351	22,932	451,125	241,227	1,218,499
April.....	490,764	14,963	13,471	209,288	160,140	888,626
May.....	505,008	13,700	18,051	99,027	158,399	794,185
June.....	585,454	13,881	21,688	101,875	153,004	875,902
July.....	575,667	14,832	20,380	355,936	191,540	1,156,355
August.....	600,974	14,514	27,255	488,940	212,848	1,344,531
September.....	543,929	15,120	27,642	455,879	210,082	1,257,524*
October.....	578,572	16,697	39,968	540,576	230,871	1,406,684
November.....	538,019	16,629	51,485	588,674	238,632	1,433,439
December.....	418,733	17,195	46,849	497,081	225,906	1,205,764
	6,324,664	188,660	355,304	4,723,139	2,418,929	14,015,588*

\*Includes 4,872 tons produced in the Yukon District.



# The Use of Coal in Pulverized Form \*

By H. R. Collins.

The purpose of pulverizing coal before burning it is to make available every heat unit it contains. Machinery has been developed which will pulverize coal in one operation, delivering it to bins in front of the furnaces at an expenditure of about 17 hp.-hr., per ton, in a medium-sized plant. The cost of the operation depends upon the amount of moisture that must be expelled before pulverizing, the cost of labor, and the cost of coal delivered at the plant. At a small plant, requiring a pulverizer with a capacity of only half a ton per hour, the cost per ton pulverized will naturally be greater than at a plant requiring the largest pulverizer, with a capacity of 7 tons per hour.

The first step is to reduce large lumps to a size suitable for drying uniformly, before passing to the pulverizing mills; this is done in rolls, at a single pass. The second step is the elimination of moisture, in order to facilitate pulverizing to great fineness, while also increasing the heating effect and the temperature attainable when the coal is burned. There are other mechanical advantages in the handling of dried coal.

Driers are now manufactured which are able to eliminate moisture without distilling any of the volatile combustible matter in the coal; they are fired by hand or with pulverized fuel. The heat first surrounds the shell of the drier, being confined within a chamber where complete combustion takes place; the heated gases are then led through a duct to the discharge end of the drier and enter the inside of the shell at a temperature not exceeding 300° F. This temperature is maintained by the operator and is indicated by a pyrometer. Volatile combustible matter is not likely to be distilled until the temperature rises above 400° F.

On discharging from the drier, the coal is usually passed over a magnetic separator in order to prevent pieces of iron from going to the pulverizer. Two types are used; a magnetic pulley which automatically discharges its collection of iron, and a lifting type, from which the iron is removed by hand when convenient.

In the operation of pulverizing, the coal should preferably be reduced until 95 per cent. will pass through a 100-mesh and 70 per cent. through a 300-mesh sieve. Such a product is obviously an almost impalpable powder.

After pulverizing, the fuel is conveyed by one of several methods to the point where it is to be used. In several installations the pulverized coal is conveyed a distance of over 900 ft. Where possible, a bin should always be installed at the furnace, in order to guard against interruption of supply.

Feeders are practically indispensable for regulating the passage of the fuel from the bin to the burner. They are now made quite simple and highly efficient. They deliver the pulverized coal in definite quantities into an air current of fixed volume, where the air disseminates the pulverized fuel, surrounding every particle and putting it into condition to develop all its energy. The first to ignite are the volatile gases; these raise the temperature to the ignition point of the solid carbon, and before leaving the zone of heated air every particle has released its last heat unit. It is entirely possible to obtain temperatures ranging between 1900°

and 3500° F.; the highest temperature (3500°) I have observed was in an open-hearth, when the average temperature of the furnace itself at some time ranged from 3100° to 3200° F.

To justify the expense of erecting a special building, and installing special machinery to pulverize coal, the following advantages in its use may be enumerated:

1. Conservation of the country's fuel, by utilizing every heat unit in the coal, made possible by this method of consumption.

2. Reduction of labor for handling coal to the point of consumption, handling by the fireman, and the removal of ash and unconsumed fuel from the ashpits; practically all of this expense is avoided when fuel is burned in pulverized form. All the coal is received at one point, and thereafter it is handled entirely by automatic machinery, the human element being thereby eliminated, except for supervision, adjustment, and repairs.

3. From actual experience with many grades of coal we believe that every carbonaceous fuel in solid form, from lignites to the graphitic anthracites of Rhode Island, will yield its maximum measure of heat, if burned in a truly pulverized condition.

4. Coal in pulverized form can be injected into a furnace on a column of air, at very low velocity, thus allowing the expanding gases to liberate their heat without erosion of the refractories.

5. Pulverized fuel permits the maintenance of a constant temperature in a furnace, when the relative amounts of fuel and air have once been set, and the body of the furnace has been brought up to the desired temperature. It will continue thereafter under what is known as a test condition. Furnaces can be operated in this manner hour after hour, as shown by charts of recording pyrometers. The correct relationship between the amount of pulverized fuel and the volume of air, for any desired temperature, can be controlled automatically, after adjustment to the particular grade of coal in use, thus using a minimum of excess air. We have obtained gas analyses as high as 17 per cent. of CO<sub>2</sub>.

Savings by the adoption of pulverized fuel in the operation of various types of furnaces have been attained as follows: heating and bushelling furnaces, 20 to 25 per cent.; puddling furnaces, 30 to 50 per cent.; open-hearth furnaces, compared with gas producers, 30 to 40 per cent.; copper reverberatory, smelting ore, 30 to 45 per cent.

In other furnaces, the consumption has been reduced to the following figures; continuous billet heating, 160 lb. of coal per ton of billets; desulphurizing iron ore in rotary kilns, 296 lb. of coal per ton of ore; drying and nodulizing iron ore in rotary kilns, on basis of 30 per cent. free moisture and 11 per cent. combined moisture 477 lb. of coal per gross ton of ore.

The above figures are from actual operations over extended periods, and confirm our contention that coal burned in true pulverized form is the only method by which every heat unit in the fuel will develop its full value.

\*Extracts from a paper to be read at the Colorado Meeting, American Institute of Mining Engineers, September, 1918.



## PERSONAL AND GENERAL

Mr. S. S. Fowler, general manager for the New Canadian Metal Company, operating the Bluebell lead mine and concentrating mill at Riondel, on the eastern shore of Kootenay Lake, B.C., has been spending a vacation in Southern California.

Mr. Herbert Carmichael, for many years provincial assayer for British Columbia, is again in Victoria, after having been for several years engaged in investigating tungsten properties in Nevada and in other mining business in California.

Mr. E. Jacobs has gone to California, after having been for twenty-two years engaged in British Columbia, largely in supplying mining journals and other publications with information concerning the progress of mining in that province.

Mr. Geo. H. Aylard, of Victoria, B.C., general manager for the Standard Silver-Lead Mining Co., operating in the Slocan district of British Columbia, has been spending the latter part of the winter in Southern California.

Mr. J. B. Tyrrell has returned to Toronto from Oklahoma.

Mr. J. H. Stovel, resident Inspector of Mines for the Sudbury district, has resigned and has entered the employ of the E. J. Longyear Company. He is located at Bessemer, Alabama.

Mr. T. B. Williams, who for several years has been chief engineer for the Canmore Coal Company at Canmore, Alberta, has accepted the position of night foreman and engineer for the Jasper Park Collieries, at Pocatongas, Alberta.

Mr. D. C. Bard, formerly of Victoria, but now with the Alaska Corporation, Seattle, Washington, recently examined mining properties in the coast district of British Columbia, with the object of securing more ore producers to ship to Ladysmith smeltery, Vancouver Island.

The Consolidated Mining and Smelting Co. is steadily increasing its output of zinc ore from its Sullivan mine in East Kootenay, B.C. The average quantity received daily at its electrolytic zinc refinery at Trail from that mine during the month of January was 185 tons; for February, it was 251 tons; for March, it was 320 tons, and for the first week of April, it was 432 tons a day.

Corp. John Thomas Garbutt, who enlisted in the 83rd Battalion, in July, 1915, died of wounds, May 19, 1916, at St. Eloi. His one brother, Fred, is in Scotland with a forestry battalion.

#### "LITTLE DAVID" PEDESTAL GRINDER.

A recent development of the "Little David" line of pneumatic tools, is the "Little David" Pedestal Grinder, No. 8, of the Canadian Ingersoll-Rand Company. This handy little machine is self-contained and can be readily moved. For mine work the most satisfactory location is with the sharpening equipment, so that as the drill steels are sharpened the shanks may be squared off.

## SPECIAL CORRESPONDENCE

## BRITISH COLUMBIA.

**Preparing for Resumption of Placer-Mining.**

As the spring season advances, preparations for resuming placer-gold mining are being made. It is expected that the supply of water for gravel-washing will be at least as large as that of most ordinary seasons, the fall of snow during the winter having been sufficient to warrant this expectation. Hydraulic mine operators have returned to Cariboo and Atlin, and in both fields piping should be in progress by the time these notes shall be printed.

**Dividends Paid by B.C. Mining Companies.**

Dividends paid by metalliferous mining companies operating in British Columbia for the first quarter of the year are reported to be higher in total than for the corresponding period of 1916, and this notwithstanding that the Hedley Gold Mining Co.'s dividend was less than for a number of years, having been restricted to three per cent. for the quarter and the usual bonus of two per cent. additional not paid. This gives a total for the quarter from that company of \$36,000 as compared with \$60,000, which was long the total of the customary quarterly distribution of profits. On the other hand, the Consolidated Mining and Smelting Co.'s quarterly dividend totalled \$261,936, against \$219,695 for the first quarter of 1916. The Granby Consolidated Co.'s total for the quarter was \$364,972, a similar amount to that of other quarters ever since the rate was increased to ten per cent. per annum. The result is that the first quarter of 1918 shows a dividend total of \$672,898 as compared with \$645,657 for the corresponding period of 1917, or a net increase of \$27,241.

## WEST KOOTENAY.

**Ainsworth.**—Ore shipment figures for the first quarter of the year show that in respect of total production there has been a substantial increase in the latter part of the period as compared with that of the first month. The total quantity of ore received at Trail from mines in Ainsworth division was 3,549 tons, of which 584 tons was the proportion for January, 1,319 tons for February, and 1,646 tons for March. The increase was not general, however, but was largely the result of a resumption of production at the Consolidated Co.'s No. 1 mine, from which 2,414 tons of silver ore, or more than two-thirds of the total, was received. The Bluebell, at Riondel, across Kootenay Lake from the town of Ainsworth, is again on the shipping list, troubles from excessive water underground having been in large measure overcome. The Florence, Little Phil, Spokane-Trinket, and Tariff, all near the western shore of Kootenay Lake; the Montezuma, on the South Fork of Kaslo Creek, and the Retallack and Bell in the western part of Ainsworth mining division, were other shippers during the quarter.

**Will Explore Manganese Deposit.**

Much interest is felt locally relative to the prospective development of a deposit of manganese ore, situated a few miles west of Kaslo, along the Kaslo and Slocan railway, on which some Seattle, Washington, men have secured an option of purchase. They state that a ready market can be found for the ore in the United States if exportation shall be permitted by the Canadian Government. Meanwhile, no work has yet been done, owing to there having been snow on the ground, but with the advance of spring this obstacle will disappear, and exploration of the extent and character of the ore will be undertaken.



**Slocan.**—Ore shipments to Trail from mines in Slocan and Slocan City divisions were considerably smaller in March than in February. The monthly totals for the quarter were as follows: For January, 712 tons; for February, 1,717 tons; for March, 575 tons; total for three months, 3,004 tons. Beside this there was a quantity of zinc concentrate shipped to the United States. Further, Northwest Mining Truth, published in Spokane, Washington, early in April, published the following statements relative to Slocan mines being operated by Mr. Clarence Cunningham, of that city, and associates: "Mr. Clarence Cunningham reports conditions at Slocan properties under his control as being satisfactory. Following declination of the Trail smeltery to accept shipments of ore as usual from the seven producers being operated under his direction, arrangements covering two years were made with the United States Smelting Co., Midvale, Utah, and shipments approximating 25 carloads monthly have been going forward for some time. Half of this quantity comes from the Queen Bess, while generous shipments are also derived from the Hewitt and Van-Roi, near Silverton. Hewitt concentrate contains about 62 per cent. lead and from 250 to 275 oz. of silver to the ton. Queen Bess ore runs more than 60 per cent. lead and about 90 oz. of silver to the ton. At the Sovereign, on Reco Mountain, near Sandon, a new body of clean ore has been found, while the Wonderful, on the opposite side of Sandon, is also yielding clean ore in quantity. At the Idaho and Alamo, on the mountain west of the Queen Bess, work has been continued in two places throughout the winter with excellent results.

"Briefly, every property under Mr. Cunningham's management now shows clean ore in quantity, while excellent saving is being made at the two concentrating mills on Four-mile Creek, near Silverton. It is understood that the Ruth mill, at Sandon, has been secured under lease and will be used for concentrating second-class ore from the Wonderful and Sovereign mines. If the results of development at the Idaho and Alamo come up to present expectations it is probable that the old concentrator at Alamo, on the C.P.R. Co.'s Slocan & Nakusp railway, about two miles below the mines, will be thoroughly overhauled and placed in operation next summer. The average number of men employed on the seven properties the Cunningham interests are operating is about 250."

**Trail.**—Ore receipts at the Consolidated Mining and Smelting Co.'s smelting works at Trail during the first quarter of the current year totalled 103,118 tons, of which 90,485 tons was ore from mines operated by the company and 12,633 tons was of custom ore. The monthly proportions of this total were as follows: For January, 27,404 tons; for February, 33,989 tons; for March, 41,725 tons. These figures serve to show the gradual progress that has been made since the settlement of strike troubles at the works last December.

More than one-half of the ore received during the period under notice was gold-copper ore from the company's mines in Rosslund camp, namely the Le Roi, Centre Star-War Eagle group, and White Bear, these having together shipped to Trail 15,843 tons in January, 16,790 tons in February, and 22,340 tons in March, making a total output of 54,973 tons. Receipts from the company's Sullivan zinc-lead mine, in East Kootenay, totalled 22,927 tons, of which 22,698 tons was zinc ore and 229 tons lead ore. From the Emma mine, in Greenwood division of Boundary district, receipts to-

totalled 9,383 tons of copper-gold ore, and from the No. 1 mine, in Ainsworth camp, West Kootenay, the total was 2,414 tons of silver ore. Shipments from other company mines were comparatively small, as follows: St. Eugene, East Kootenay, 281 tons of lead ore; Molly Gibson, in Nelson division, 342 tons of silver-lead ore; Lucky Thought, 129 tons, and Richmond-Eureka, 36 tons, both of silver-lead ore from Slocan division. Custom ore was in the proportion of 2,483 tons for January, 5,906 tons for February, and 4,244 tons for March.

Taking the receipts from the various districts or divisions, the quantities were as follows: From East Kootenay, 24,657 tons. From West Kootenay: Rosslund, 59,057 tons; Ainsworth, 3,549 tons; Slocan, 3,004 tons; Nelson, 655 tons; Trout Lake, 108 tons, and Arrow Lake, 10 tons. The total from Boundary district was 9,413 tons; from Kamloops division, Yale district, 836 tons, and Vancouver Island, 76 tons. Mines in the State of Washington shipped to Trail only 1,753 tons during the quarter, but much lead ore would have come from that source had lead-market conditions been such as would have admitted of its being smelted at Trail. As indicating the unfavorable position in regard to lead ores, it may be pointed out that of a total in excess of 100,000 tons of British Columbia ore received during the quarter, less than 6,000 tons was silver-lead ore, while the chief metal content of more than 60,000 tons was gold, of about 25,000 tons was zinc, and of 10,000 tons was copper. These quantities are approximate, yet they serve to give a general idea of the metal contents of the ores received at Trail during the first quarter of this year.

#### VANCOUVER ISLAND.

##### Coal Mining Companies Busy on Vancouver Island.

Coal-mining continues to be especially active on Vancouver Island, with the producing mines being operated to the full extent practicable under present conditions, there still being fewer miners obtainable than could be given employment at these collieries. The Canadian Collieries (Dunsmuir) Limited, is working its larger mines in both the Comox and Extension fields, and is proceeding with the development of a small mine near South Wellington. The Western Fuel Company continues to make a large output of coal from its Nanaimo colliery, with its No. 1 and Protection Island mines being operated, and its Reserve Shaft mine, several miles south of Nanaimo, opened in recent years and now also an important producer. This company, also, is developing a property that it is planned shall add considerably to the output of coal. The Pacific Coast Coal Mines, Ltd., is making its largest production from the Morden mine, opened in recent years in a part of the South Wellington field that had not previously been mined for coal, and its outlook is favorable for an increasing production as demands shall warrant further expansion, already provided for by the installation of modern plant and machinery and the establishment of shipping docks and loading appliances equal to handling a large quantity of coal. Progress is being made with the development of the coal lands situated a few miles south of South Wellington, acquired and now being opened by the Granby Consolidated Mining, Smelting, and Power Company.

Metalliferous mining is still having attention notwithstanding that ore-smelting facilities are not at present available under conditions allowing of a satisfactory return being received should ore be shipped. The Ladysmith Smelting Corporation has made it known that whenever there shall be a sufficient supply of ore



obtainable to ensure the continuous operation of its works, it will resume smelting at Ladysmith, but for the time the smeltery is idle, there being no profit in its operation intermittently. This company is developing what is known as the Thomson-Tolmie copper property, situated on Sooke Peninsula, southwest of Victoria, and it is expected that eventually sufficient ore will have been developed to make it a producer of importance. Another copper property in the same part of the island has already had the attention of local men who have been much encouraged by results obtained from the shipment of ore in quantity—several hundred tons—to Ladysmith. It is stated that New York men have lately bonded this mine, and are having it examined with a view to doing considerable work on it if a favorable report shall be received. Shipment of ore from the Blue Grouse, near Cowichan Lake, has been made to up-country smelting works, but freight and other charges have been found too high to allow of more being shipped under the circumstances. Another mine on which work has been done is that known as the Indian Chief, on Sidney inlet, west coast of Vancouver Island, and concentrating plant has been put in at it, but little is known as to recent results, except that beside the concentrating ore there has also been found some copper ore of high grade.

#### THE U.S. WAR MINERALS BILL.

Washington—According to the Boston News Bureau, the outlook is propitious for early action on the U.S. war minerals bill, carrying \$50,000,000 to encourage domestic production of rare minerals needed by the government for war-making purposes.

The terms of the measure carry the power of price fixing by the President, who is authorized to place the carrying out of its regulations in the hands of the secretary of the interior. It is definitely recognized as an administrative measure, and is strongly backed by Secretary Lane. Among the large number of minerals included in the bill, many are found which will be drawn upon heavily in war requirements, thus necessitating a price-fixing provision to stabilize the markets, as well as to furnish the incentives to high production through assurance of reasonable profits. While some objections have been raised against extension of the price-fixing provision in coming legislation, it is pointed out by supporters of the measure that such definite authority is more essential in the present instance than in dealings with the government with manufactured commodities, such as virtually new industries are called for in some instances in the present bill.

The bill also carries power to increase tariff rates on any of the war minerals whose production is to be encouraged, if this should be found necessary to prevent the government from confronting a loss by coming into competition at any time with imports of the same materials from abroad. This precaution naturally contemplates a situation such as would be brought about by the declaration of peace during any period which might be covered by the government's guarantee of a minimum price.

No small consideration has been given to the question of ship tonnage in the preparation of the bill. It has been estimated that the development of iron pyrites production alone in the United States will serve to release thousands of tons of space for other requirements in war transportation. In many respects, however, increased production is aimed at in direct connection with urgent war needs.

#### Advice From the Fuel Controllers

Ottawa, April 19.—C. A. Magrath, Fuel Controller for Canada, to-day made the following statement:

"The new fuel regulations went into effect on the 1st of April. Provision is made therein that no consumer may be supplied with more than 70 per cent. of his estimated normal needs for the year ending 31st March, 1919. I desire to point out, however, that this provision is not in any way designed to place obstacles in the way of consumers laying in coal supplies during the summer time. It is merely intended to ensure a more even distribution of coal receipts.

"The regulations on this point are extremely elastic, and provision is made whereby the moment the consumers in any municipality have been supplied with 70 per cent. of their requirements, the Provincial Fuel Administrator may, on the advice of the local Fuel Commissioner, entirely suspend the restriction referred to or may increase the percentage that may be delivered in any way he deems desirable. My advice to consumers throughout Canada is to get their coal supplies at the earliest possible moment and in as large quantities as they are able to, consistent with any restrictions that may be in force at the time.

"It is well for the people of Canada to bear in mind that we are absolutely dependent upon the United States for the great bulk of our coal supply. The United States Fuel Administration, in placing Canada on the same basis as the states of the Union with reference to coal shipments, has displayed a spirit of fairness which all Canadian will duly appreciate. There is, however, the implied moral obligation resting on Canada to conserve her fuel supply to assist the authorities across the line to solve the common fuel problem in any practical manner that may be indicated. Dr. Garfield, the United States Fuel Administrator, has recently issued a statement in which he lays the greatest possible stress on the public placing their orders for coal at the earliest possible moment. This advice, of course, applies with at least equal force to Canada.

"Dr. Garfield, in discussing the fuel situation south of the line, points out, that it is fundamentally a transportation problem. He goes on to say that there are sufficient coal cars and locomotives available only if every car and every locomotive is used to its maximum capacity every day in the year."

Toronto, April 22.—Some unexpected and most important announcements regarding the fuel and power situation, both in Canada and the United States, were made by Sir Henry Drayton, Dominion Power Controller; Sir Adam Beck, chairman of the Hydro Power Commission, and Commissioner R. C. Harris, Associate Fuel Controller, before a gathering of business men at the City Hall yesterday afternoon. Briefly stated, they were to the effect that, owing to the tremendous demands for electrical energy and fuel in both countries, to enable manufacturers to increase the output of munitions which were urgently needed, further restrictions would in all probability have to be placed on the use of light, power and coal by non-essential industries, merchants, storekeepers and private citizens. Beyond this the people were warned that next winter they must be prepared to suffer inconvenience and some measure of discomfort during the extremely cold weather, as it would be an absolute impossibility for the United States to supply sufficient coal to meet the normal demand for industrial and domestic uses. Canada would obtain



its proportionate share of the coal mined, and it would be distributed pro rata throughout the country, but there would be a shortage. The people of Toronto and of every city and town in Ontario, would have to conserve their coal supplies and be content to keep their houses less comfortable and warm than in former winters. In fact, they even might be called upon to close up part of their houses in order to conserve heat. Further than this, they would be well advised to endeavor to secure some substitute for coal, even if the thermal values were not so great. The question of comfort could not be considered, as the supply of coal coming from the States would only suffice to prevent actual hardship and distress.

Ottawa, April 20.—At the close of the conference held here this week of coal operators, labor delegates and transportation representatives with Mr. Neale, representing the United States Fuel Administration, and Mr. C. A. Magrath, Dominion Fuel Controller, a memorandum was submitted by Mr. Magrath covering the chief developments of the conference, which lasted for a couple of days.

The memorandum contained the important statement that the United States Fuel Controller felt it his duty to inform the Canadian Fuel Controller, so that he could pass the information to the Western provinces of Canada, that the situation is as follows:—

1. That anthracite coal supplies to points in Western Canada will be very materially restricted during the present coal year.
2. Under the circumstances, it is safe to predict that no American anthracite coal will be available for shipment to points west of Winnipeg.
3. It is also proposed to restrict shipments of anthracite to Canadian lake ports during the early part of the present season.
4. That the public, both East and West, must be given to understand distinctly that conservation of coal must be practised to the utmost extent by all classes of consumers.

Mr. Magrath's memorandum said that Sir George Foster had been able to announce that the attitude of the United States Fuel Administration was that Canada would receive precisely the same treatment as the various states of the Union. The Western States had been given to understand that they must use the softer coal of the West and that the available anthracite would have to be conserved for the purpose of supplying the Eastern part of the Union and the Provinces of Ontario and Quebec.

The Western coal operators stated their ability to increase the production of bituminous coal by 1,280,000 tons and of lignite coal by 1,225,000 tons. These increases would represent the amount of coal that could have been mined during the times the mines were idle last year due to strikes and want of railway transportation. The figures would not hold good unless the same amount of labor was available as last year, and unless the railways were able to furnish transportation required.

The operators urged that dealers and the public take a large portion of their supply during the summer months, when the railways are in a position to handle it.

The memorandum of the Nova Scotia operators stated that the production of Nova Scotia mines had been estimated at 5,950,000 tons, but the production actually attained was 5,660,000 tons. The operators reported a considerable improvement in transportation facilities, and pointed out that scarcity of labor had been the main factor in the reduction of output.

### House Discusses Fuel Problem

In the House of Commons on April 15th Mr. J. E. Armstrong of Lambton proposed a resolution urging that deposits of bituminous and anthracite coal in Canada, located in the extreme Eastern and Western portions of the Dominion be more thoroughly utilized, that peat and lignite deposits be developed, and that the Government make a special effort to this end. Development of Canadian coal areas, he said would materially increase production.

Turning to natural gas, Mr. Armstrong stated that the waste of this valuable product in the West was enormous. He had, he said, written to the Interior Department protesting against the waste. Natural gas, he said, was the cleanest and best of fuel, and was used extensively in the United States for the manufacture of gasoline. The Government ought to take action to conserve the gas supply of the Dominion.

Powdered coal was another product which the speaker thought could be successfully used in Canada. It has been a success in Brazil, and also in the United States.

The development of Canada's great water powers for the production of electricity was urged by Mr. Armstrong. He recommended the appointment of a Minister whose duties should consist in developing water power for light, heat and power. In the Dominion, he said, 17,000,000 horsepower was undeveloped. The peat deposits of Canada should also receive the attention of the Government.

In closing, Mr. Armstrong emphasized the seriousness of the fuel situation, and insisted that drastic measures must be enforced by the Government. At present the Dominion was absolutely dependent on the United States, and if that country should be unable to supply our demands we would find ourselves in a bad situation.

W. D. Cowan, Regina, wanted to know what the Government was going to do in the line of developing the Saskatchewan coal fields. He was pleased to hear from the previous speaker that an Order-in-Council providing for an expenditure of \$400,000 on the Saskatchewan coal fields had been passed.

In Saskatchewan, said Mr. Cowan, while these coal fields were only producing 200,000 tons a year, people were importing Pennsylvania coal. He argued that Saskatchewan was not a legitimate market for coal from Pennsylvania.

H. C. Hocken (Toronto West) spoke of the suffering in Ontario last winter owing to lack of fuel. If Western coal areas were developed, Pennsylvania coal now going to the West might be diverted to Ontario, and material improvement thus effected. Mr. Hocken urged the development of water powers with a view to the operation of railways by electricity and the saving of coal.

The Minister of Mines dealt briefly with the efforts of the Government to develop peat production in Canada. About 140,000 acres of peat bogs had been mapped out. He referred to the experiments which had been made by the Government at Alfred, Ontario, saying that \$18,000 had been spent there in experimental work. In 1910 the operations at Alfred were discontinued. A private corporation which subsequently failed, taking over the plant. Owing to the fuel shortage last year, the Government had resumed experiments at Alfred, and these were now being conducted in co-operation with Provincial Government of Ontario. In



closing, Mr. Burrell said that he would bear in mind the suggestions which had been brought out by the debate.

Hon. Arthur Meighen replied to the statements of Mr. Armstrong in respect to the escape of natural gas on Dominion lands in Alberta. Mr. Meighen denied that there was any laxity on the part of the Mining Lands Branch of the Interior Department, and indicated the steps taken to prevent any waste of natural gas. Regulations to control Dominion mining lands, Mr. Meighen said, had been in effect for the last four or five years.

W. A. Buchanan (Lethbridge) felt that Western mines could meet the needs of the Western provinces and some of the needs of Eastern Canada. He was not quite sure, however, whether it was feasible to ship Western coal to Eastern markets. He thought the question of storage might well be taken into consideration by the Government, as it would go far towards solving the problem in Alberta.

J. C. Douglas (South Cape Breton) declared that the three greatest questions of the day were those of continued reinforcements for the troops in France, increased food supplies and increased coal production. He said that if the Fuel Controller was appointed mainly with a view to increasing production in Canada, and not to borrow coal from the United States, then he had been unsuccessful in his work. Since the appointment of Mr. Magrath in July, last, there had been a decrease of 600,000 tons in the production of coal in Eastern Canada.

To remedy the situation, he proposed that a reduction in the overhead charges of collieries should be effected, underpaid employes should receive increased wages, mining machinery in Nova Scotia should be improved, and companies should be made to spend excess profits in improving conditions at the mines generally. He also urged the appointment of an energetic man as a "speeder-up," the appointee to be given wide powers.

Dr. Clark (Red Deer) advocated the lifting of restrictions on the entry of mining implements to this country, declaring that only a nominal duty on such tools had existed in Argentina for a great many years. He urged the removal of the duty, but cautioned the Government not to give money away where the tariff had failed.

Alex. McGregor, Pictou, suggested that the Dominion Government should co-operate with the Provincial Government of Nova Scotia and take over the mines

of the Acadian Coal Company, operating them in such a way as to benefit the public. He did not approve the way these mines were being operated by the company.

Dr. Edwards argued that Dr. Michael Clark's assumption that the removal of the duty from coal would tend to solve the fuel problem was incorrect. The kind of coal which was used for domestic purposes and to heat houses was anthracite coal, on which there was no duty. He maintained that the trouble last year was due largely to a shortage of cars and inclement weather, which made it impossible to move the fuel.

Sir George Foster devoted the major portion of his remarks to a vindication of the Fuel Controller and an explanation of what his duties actually are. He said that the Government, in making the appointment, did not have in view the enhancing of coal production in Canada, so much as making it definitely sure that the allotment of 16,000,000 tons of coal from the United States should be obtained and equitably distributed at a fair price in Canada. He maintained that Mr. Magrath had successfully carried out his part of the programme, with the help of the United States authorities, who had been eminently fair and sympathetic in their dealings with him.

"His duty was to get the coal to Canada, but not to transport it after it had been brought across the border. The bad situation last winter, in connection with the transportation, was responsible for a great deal of the suffering throughout the country. Some people fear that we shall suffer privations again this year. If things go on ordinarily well and the transportation difficulties are not so great as last year, we shall get out allotment of 16,000,000 tons as usual."

With regard to the Western lignite coal, Sir George stated that the Government, in co-operation with the Provincial Governments of Manitoba and Saskatchewan, proposed to establish one or two units for making briquettes near Estevan. If this experiment proved a success, the Government could then choose whether it would continue the manufacture of briquettes for public consumption or leave this to private enterprise. A start on the installation of the Estevan plant would, said the Minister, be made at once, but it would be a year before manufacture of briquettes could be started. Briquettes could be manufactured at a cost of between six and seven dollars per ton and the supply of low-grade lignite coal in the West was practically inexhaustible.

CANADIAN PRODUCTION OF COAL IN RECENT YEARS.

	1915		1916		1917	
	Tons	Value	Tons	Value	Tons	Value
Nova Scotia.....	7,463,370	\$16,659,308	6,912,140	\$18,514,662	6,324,684	\$23,740,176
New Brunswick.....	127,391	309,612	143,540	386,016	188,660	705,673
Saskatchewan.....	240,107	365,246	281,300	441,836	355,304	662,228
Alberta.....	3,360,818	8,283,079	4,559,054	11,386,577	4,723,139	14,197,756
British Columbia.....	2,065,613	6,455,041	2,584,061	8,075,190	2,418,929	8,308,581
Yukon Territory.....	9,724	38,896	3,300	13,200	4,872	29,232
	13,267,023	\$32,111,182	14,483,395	\$38,817,481	14,015,588	\$47,643,646

IMPORTS OF COAL IN 1916 AND 1917.

	1916			1917		
	Tons	Value	Average	Tons	Value	Average
Bituminous, round and run of mine..	9,504,552	\$12,368,679	\$1.30	12,407,486	\$33,712,894	\$2.72
Bituminous, slack.....	3,505,236	3,704,624	1.06	3,129,776	8,739,877	2.79
Anthracite, coal and dust.....	4,570,815	22,216,363	4.86	5,320,198	28,109,586	5.28
Total.....	17,580,603	\$38,289,666	\$2.18	\$20,857,460	\$70,562,357	\$3.38

CANADIAN MINERAL PRODUCTION BY PROVINCES 1916 AND 1917.

Province	1916		1917		Increase (.) or Decrease (—)
	Value of Production	Per cent. of Total	Value of Production	Per cent. of Total	
Nova Scotia.....	\$20,002,262	11.31	\$25,333,643	13.13	5,291,381
New Brunswick.....	1,118,187	0.63	1,372,620	0.71	254,433
Quebec.....	14,406,598	8.13	17,115,161	8.87	2,708,563
Ontario.....	80,461,323	45.41	88,821,815	46.02	8,360,492
Manitoba.....	1,823,576	1.03	2,539,393	1.32	715,817
Saskatchewan.....	590,473	0.33	832,335	0.43	241,862
Alberta.....	13,297,543	7.50	16,426,154	8.51	3,218,611
British Columbia.....	39,969,962	22.56	36,161,528	18.74	3,808,434
Yukon.....	5,491,610	3.10	4,380,188	2.27	1,111,422
Dominion.....	\$177,201,534	100.00	\$192,982,837	100.00	15,781,303

**TORONTO MARKETS.**

Cobalt oxide, black, \$1.50 per lb.  
 Cobalt oxide, grey, \$1.65 per lb.  
 Cobalt metal, \$2.25 per lb.  
 Nickel metal, 45 to 50 cents per lb.  
 White arsenic, 17 cents per lb.  
 April 24, 1918—(Quotations from Canada Metal Co., Toronto).  
 Spelter, 10 cents per lb.  
 Lead, 9 cents per lb.  
 Antimony, 16 cents per lb.  
 Copper, casting, 28 cents per lb.  
 Electrolytic, 28½ cents per lb.  
 Ingot brass, yellow, 21 cents; red, 26 cents per lb.  
 April 24, 1918—(Quotations from Elias Rogers Co., Toronto).  
 Coal, anthracite, \$10.00 per ton.  
 Coal, bituminous, nominal, \$9.50 per ton.

**SILVER PRICES.**

April—	New York cents.	London pence.
12 .....	93%	46¼
13 .....	93%	46¼
15 .....	95¼	47
16 .....	95%	47¼
17 .....	95%	47¼
18 .....	95%	47¼
19 .....	96%	47¾
22 .....	99¼	49

**NEW YORK MARKETS.**

Connellsville Coke—  
 Furnace, \*6.00.  
 Foundry, \*7.00.  
 Crushed, over 1-inch:  
 Beehive, \*7.30.  
 \*Fixed under Lever Act.

Straits Tin, spot, f.o.b. none offering.

**Copper—**

Prime Lake, 23.50.  
 Electrolytic, 23.50.  
 Casting, 23.50.  
 Lead, Trust price, 7.00.  
 Lead, outside, normal, 7.12½.  
 Spelter, prompt western shipment, 6.87½.

**Antimony—**

Chinese and Japanese nominal, 12.25 to 12.50.  
 Aluminum—Government price, carload lots, f.o.b. plant:  
 98-99% Virgin, 32.10.  
 98-99% remelt, 32.10.  
 No. 12 Aluminum Co., 32.30.  
 No. 12 remelt, 32.30.  
 Sheet 18 ga. and heavier base, 40.20.  
 Powdered aluminum, 65.00 to 70.00.  
 Metallic Magnesium—99% plus \$2.00 to 2.50.  
 Nickel—Shot and ingot, 50.00.  
 Electrolytic, 55.00.  
 Cadmium, nominal, \$1.45—1.50.  
 Palladium, \$115.00.  
 Quicksilver, nominal, \$120.00—125.00.  
 Platinum (pure), \$105.00.  
 10 per cent. Iridium, \$113.00.  
 Cobalt (metallic), 2.50 to 3.50.

**Tungsten—**

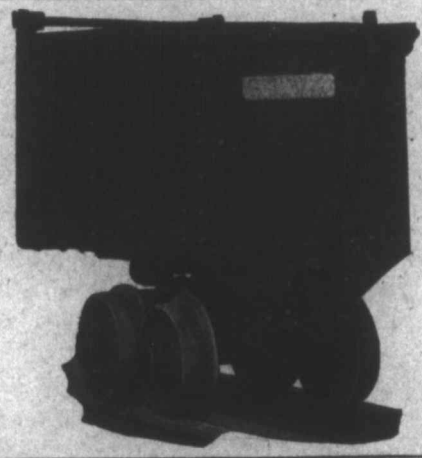
Scheelite, 24.50.  
 Wolframite, 20.00 to 24.00.  
 Gravel Fluorspar: f.o.b. mines—  
 Prompt, 33.00 to 35.00.  
 Contract, year 1918, 25.00 to 28.00.  
 Silver (official), 99¼.

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**WILL DUMP EITHER END OR EITHER SIDE**

We make these cars to order only, and to suit the customer.  
 We make and list two standard types, with a choice of eight sizes and shapes in each type.  
 We also make any other style to customer's specifications.  
 Prices reasonable; Delivery good.  
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