

Coal Problem of Canada Demands National Action

A Solution of a Vital National and International Question Outlined — Our Natural Resources Not Inexhaustible — Canada's Present Dependence Upon the United States for Coal — The Dominion Possesses Independent Fuel Resources Which Must Be Developed

By ARTHUR V. WHITE

SO much has been said, drawn from seemingly authoritative sources, respecting the "unbounded extent of the natural resources of Canada," that it is little wonder the popular view is entertained that Canada's resources are practically unlimited, and perpetual prosperity only waits upon their fuller development. For Canadians, however, to hold and be governed by such a view is to live in a "fool's paradise."

Little more than a decade ago, a large majority of the people of the United States believed that the natural resources of their country were unbounded, and that there was hardly any limit to material progress based upon their development. Even in that country, however, there were many who did not share these views, and through their efforts special investigation was made respecting the actual conditions of the natural resources of the nation.

Natural Resources of United States Exhaustible

The President called for a conference of the governors, leading officials and experts of all the States of the Union. Addressing the conference on the 13th of May, 1908, the President stated:—

"This nation began with the belief that its landed possessions were limitless and capable of supporting all the people who might care to make our country their home; but already the limit of unsettled land is in sight, and, indeed, but little land fitted for agriculture now remains unoccupied save what can be reclaimed by irrigation and drainage. . . . We began with an unapproachable heritage of forests; more than half of the timber is gone. We began with coal fields more extensive than those of any other nation and with iron ores regarded as inexhaustible, and many experts now declare that the end of both iron and coal is in sight. . . . The enormous stores of minerals, oil and gas are largely gone. . . . Our natural waterways are not gone, but they have been so injured by neglect and by the division of responsibility and utter lack of system in dealing with them that there is less navigation on them now than there was fifty years ago. Finally, we began with soils of unexampled fertility, and we have so impoverished them by injudicious use and by failing to check erosion that their crop-producing power is diminishing instead of increasing. In a word, we have thoughtlessly, and to a large degree, unnecessarily, diminished the resources upon which not only our prosperity, but the prosperity of our children and our children's children must always depend."

Canada's Natural Resources Also Exhaustible

No country possesses, within its own borders, more varied and extensive resources than the United States, yet it is now recognized that many of these are within measurable distance of exhaustion. This fact was so clearly demonstrated that prompt action by the trustees of the nation became imperative. So far as one can judge, natural resources from the 40th parallel to the Gulf of Mexico are better situated, geographically, and must always be more desirable than those from the 49th parallel to the Arctic ocean; thus, by reason of situation, Canada's usable natural resources are in variety and extent less than those of the United States.

Those who have observed the rapid disappearance of many of the natural resources of Canada and the present alarming rates at which some are being consumed, realize that the situation, as a whole, is one of great gravity. Consequently, true conservation in Canada is as great, if not greater, a necessity than in the United States.

On the 6th of December, 1917, at the annual meeting of the Bank of Montreal, its president, referring in hopeful

terms to Canada, said: "Our natural resources are unbounded and our credit is irreproachable."

Now, as a matter of fact, our resources are not unbounded, and our very credit is involved in the use we are making, and shall make, of the resources at our disposal. Many of these, as just stated, at present rates of depletion, and without proper methods of conservation being rigidly applied, are within measurable distance of exhaustion. By way of illustration: There was a time—and not so very long ago either—when the buffalo and the carrier pigeon existed in the United States and Canada in countless millions. To-day they are gone.

Resources Must Be Wisely Used and Conserved

It is true that some resources, such as minerals—perhaps more especially coal, oil and gas—if used, must in time, necessarily become exhausted. On the other hand, such resources as the soil, plants, grass, waterways and ground waters, may be conserved and transmitted to posterity unimpaired, or at least unabsorbed, just as a good husbandman passes on his farm in an improved condition to that in which he received it. The policies advocated by the Commission of Conservation of Canada have aimed at passing on to succeeding generations in an improved condition the heritage of the natural resources of this country.

By intelligent and thrifty use, the natural resources of Canada may beneficently serve the needs of a large population. If, however, Canadians become really dependent upon necessary commodities supplied them by other countries, they must be prepared to accept the circumstances in which they may suddenly find themselves if the supply of such commodities is cut off. Such circumstances will be aggravated by any abuse of our assets.

Coal Scarcity and Coercion

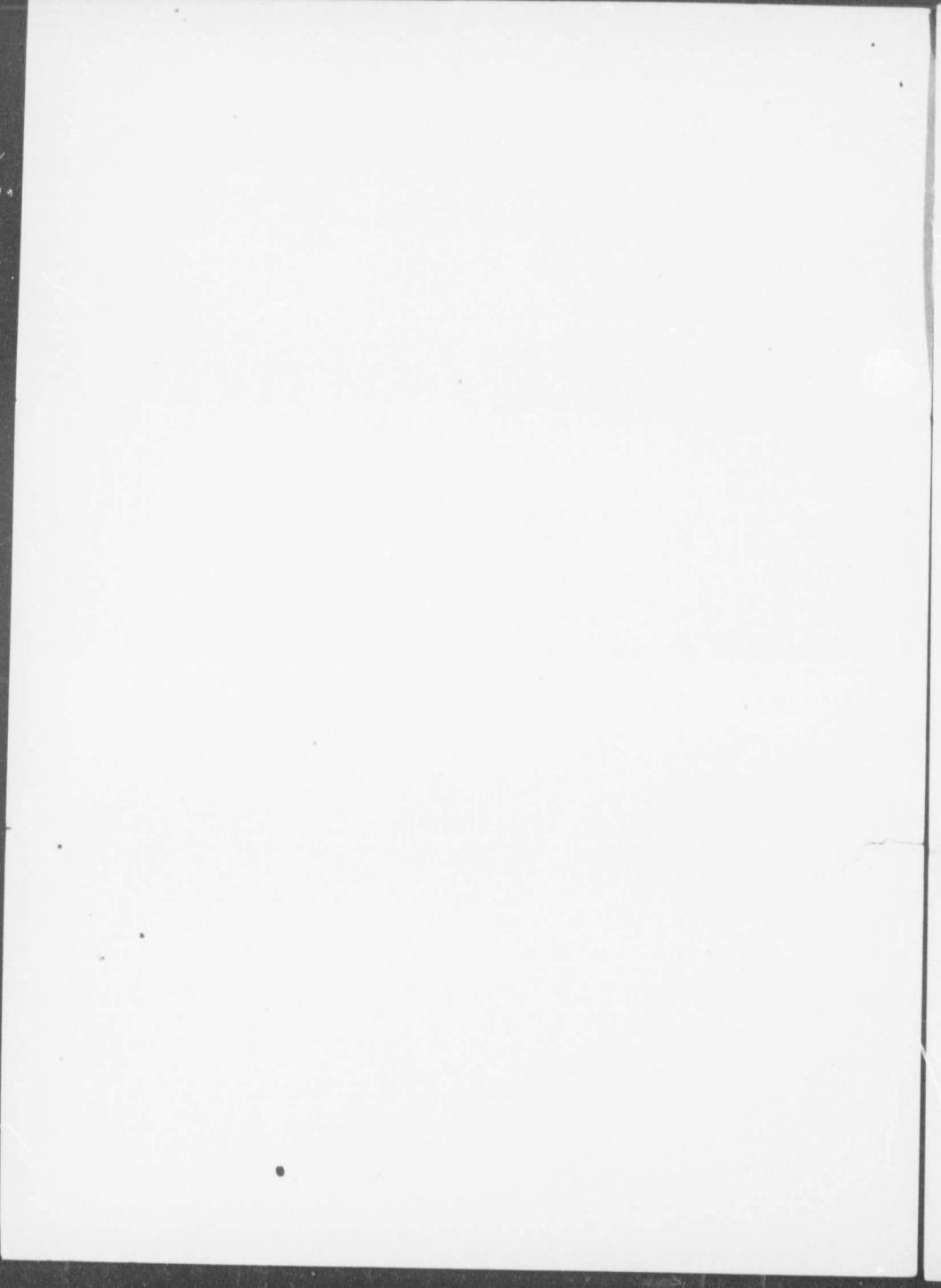
There is, apart from food, raiment and shelter, perhaps no single commodity which has been found so necessary for the maintenance of life and for the carrying on of commerce and transportation as fuel—chiefly coal. During the past few months the public interest has been keenly aroused respecting the nation's fuel supply and increasing dependence upon hydro-electric energy. The present war conditions are going to drive home to Canadians as never before the tremendous gravity of their position with respect to fuel.

Countries like Norway and Sweden, Denmark, Holland and Switzerland—countries, indeed, which are neutral—are practically dependent upon the warring nations for coal, and have found themselves seriously curtailed in obtaining this commodity. They have been forced to recognize the momentous fact that the countries which possess coal are able, absolutely, to dictate the terms upon which coal will be supplied to others.

Norway and Sweden are short of coal. Both Great Britain and Germany have released coal to these countries in exchange for food. Britain has required European neutral ships calling for coal to bring cargoes of foodstuffs or other desirable commodities. Holland must get its coal from Germany which consents to supply it only in return for large quantities of food, especially vegetables and meat raised on Dutch soil. Holland at present has open to her no other market in which to secure coal. From Switzerland, Germany demands cash at the rate of 40,000,000 francs monthly for nine months at five per cent. in return for a monthly delivery of 200,000 tons of coal; and within the last month it has been reported that Germany has liberated some hundreds of agents instrumental to secure control of the hydro-electric resources in Switzerland, so that, with these under their direction, and in control, also, of the coal supply, Germany would more completely dominate Switzerland. One of the chief factors

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JAN 5 1918



which has existed in connection with Alsace-Lorraine has been that Germany wishes to maintain this outlet for her coal and in return derive from these areas the supply of iron which she herself lacks. The necessities of life—not the precious metals—are the real arbiters of exchange.

Portion of Canada Dependent Upon United States for Coal

Now, a very large portion of Canada—and for this one may hold in mind much of the populated territory extending, say, from Quebec to Winnipeg—has become increasingly dependent for its fuel supply upon the coal fields of the United States, and absolutely dependent upon that country for its annual supply of some 4,500,000 tons of anthracite coal.

In addition to the use of imported anthracite coal for fuel for heating and domestic purposes, large quantities of bituminous coal—some 10,000,000 to 14,000,000 tons—are also imported from the United States, largely for power purposes.

The known anthracite coal fields of the United States are within measurable distance of exhaustion. Upon this point there seems little difference of opinion. The time during which the supply will last, at rates of consumption existent prior to the war, is placed at about one hundred years. Doubtless, in the near future, the United States will feel compelled to conserve this valuable commodity, and the exportation of it may be largely restricted, if not entirely cut off.

There are available scores of examples, arising out of the present war conditions, where the United States has found it necessary to place stringent embargoes upon natural and manufactured products.

If Canada is to be in a position to command special consideration under possible restricted conditions, she must realize the value of her own resources and have them strictly under national control in order that she may be enabled to deal on a basis of *quid pro quo*. When the commodities of commerce are exchanged there must, of course, be a substantial basis for barter. When Germany demanded gold from Switzerland she offered to exchange coal. Suppose that the United States, in the conduct of her commerce, concluded that it was in the national interest of her citizens only to barter coal for certain commodities which she specially required, what desirable commodities has Canada to barter?

Canada an Exporter of Electrical Energy

Other than the products of her agricultural lands, mines and forests, there are certain resources in Canada of unique and special value. One of these is the hydro-electric energy which may be developed from Canada's waters, including her equity in international waters. At the present time the United States is importing from Canada about 275,000 horse-power years of electrical energy.* Many factors, of course, enter into the determination of the equivalent of this electrical power in terms of anthracite coal. Electric power has great advantage for many purposes over steam. Speaking in round figures, and taking cognizance of some of these special factors, the electrical power now imported by the United States would be the equivalent of probably not less than 3,000,000 tons of coal—it may be a quantity substantially greater.

Canada has been richly endowed with water-powers, although those serviceable from the standpoint of present economic development should be carefully conserved so that they may be used in the general public interest.

Any estimate for the water-powers of Canada must be presented and considered with a due appreciation of its limitations. The following table representatively sets forth the water-power situation in Canada. By no means may all the water powers be economically developed:—

Estimate of Water-Power Resources of Canada **

Province	Total possible horse-power.	Developed horse-power.
Ontario	5,800,000	760,000
Quebec	6,000,000	640,000
Nova Scotia	100,000	26,000
New Brunswick	300,000	15,000
Prince Edward Island	3,000	500
Manitoba	3,500,000	76,000
Saskatchewan		33,000
Alberta	3,000,000	250,000
North-West Territories		12,700
British Columbia	100,000	
Yukon		
Total	18,800,000	1,813,200

Men far-sighted in the fields of industry and finance have foreseen the extent to which present and future generations will be increasingly dependent upon power, whether it be steam or hydro-electric.

Concentration of Control

In the United States, for many years past, special efforts have been made to concentrate control of water-powers. Most of the water-powers which are more readily capable of economic development in Canada, as well as in the United States, either have been already developed or are privately controlled. Concentration of ownership is a noticeable feature of this control. It has been authoritatively published that in the United States, in 1913, about 6,300,000 horse-power was controlled by ten groups of interests. This concentration is still going on. Owing both to provincial and federal legislation, it has not been possible for interests so readily to obtain control of water-powers in Canada. Efforts, however, are continually being made to secure the rights for such desirable water-powers as are yet vested in the Crown. The efforts made by the powerful financial interests behind the Long Sault Development Company to obtain control of the almost unequalled power rights at the Long Sault rapids, on the St. Lawrence River, are still in mind.†

Power Monopoly

The public cannot be too well informed respecting the extent to which they may be compelled to pay tribute to those concentrating hydro-electric powers, by reason of the control which such interests have over the distribution and supply of electrical energy.

In this connection no words are better fitted to express what is going on than those of Mr. Gifford Pinchot when he states:—

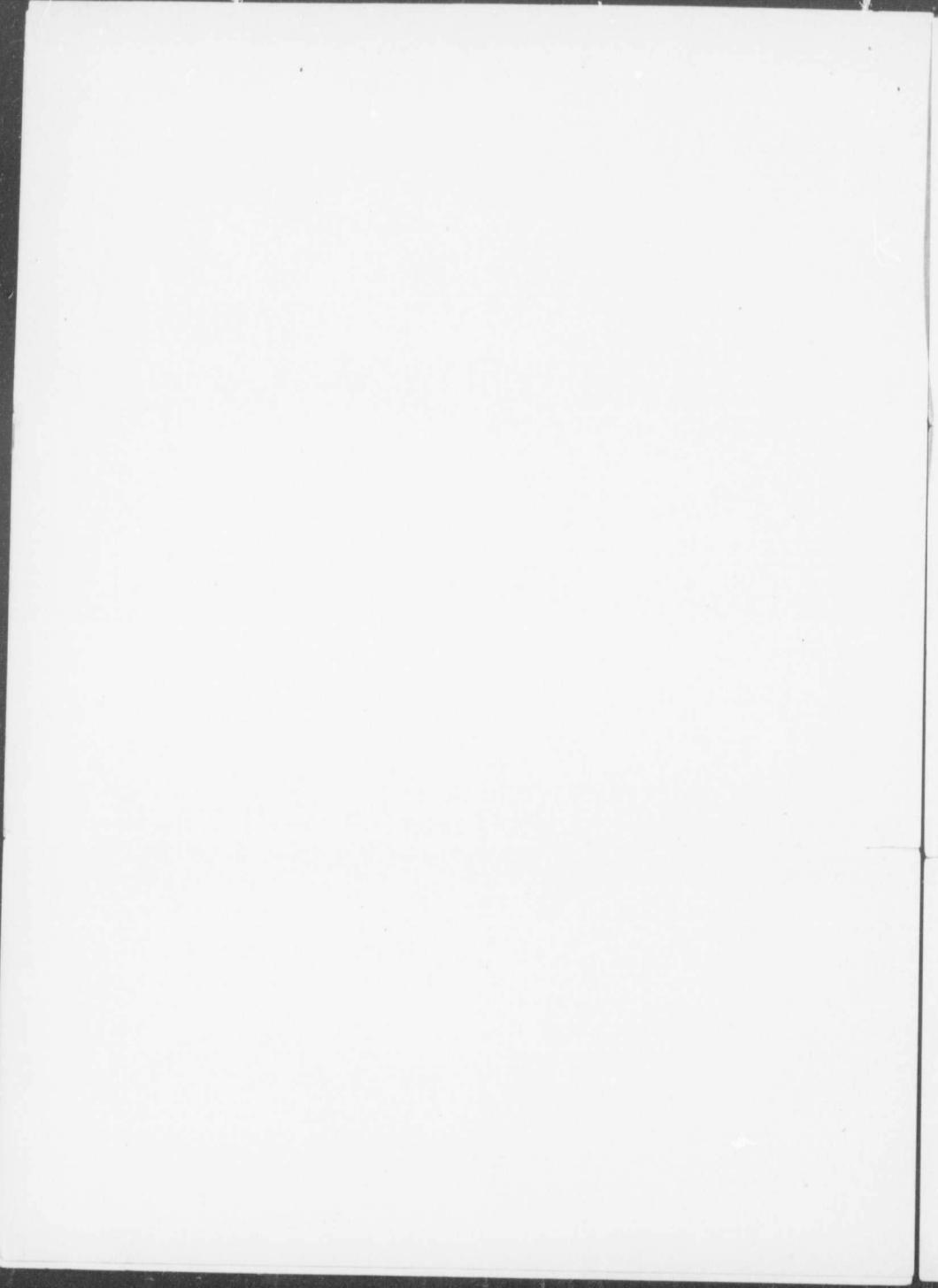
"And whoever dominates power, dominates all industry. Have you ever seen a few drops of oil scattered on the water, spreading until they formed a continuous film, which put an end at once to all agitation of the surface? The time for us to agitate this question is now, before the separate circles of centralized control spread into the uniform, unbroken, nation-wide covering of a single gigantic trust. There will be little chance for mere agitation after that. No man at all familiar with the situation can doubt that the time for effective protest is very short. If we do not use it to protect ourselves now we may be very sure that the trust will give hereafter small consideration to the welfare of the average citizen when in conflict with its own."

Respecting the water-powers of the United States and the attempt to create a monopoly of same, Mr. Roosevelt, in accurate, prophetic terms, as true for Canada as the United States, has stated that:—

"The people of this country are threatened by a monopoly far more powerful, because in far closer touch with their domestic and industrial life, than anything known to our experience. A single generation will see the exhaustion of our natural resources of oil and gas, and such a rise in the price of coal as will make the price of electrically transmitted water-power a controlling factor in transportation, in manufacturing, and in household lighting and heating. Our water-power alone, if fully developed and wisely used, is probably sufficient for our present transportation, industrial, municipal and domestic needs. Most of it is undeveloped, and is still in National or State control. To give away without con-

*Respecting various phases of this subject, consult an article by Arthur V. White on the "Exportation of Electricity," which appeared in the *University Magazine*, October, 1910, pages 460 et seq. Consult, also, *Toronto World*, March 25th, 1912, also "Exportation of Electricity—An International Problem: Relation of a Possible Coal Embargo by United States to a Curtailment or Stoppage of Canada's Electric Power," by Arthur V. White, in *The Monetary Times* of January 5th, 1917, pages 21 et seq. Consult, also, *Annual Reports of Commission of Conservation*, Ottawa.

**See *Conservation*, Ottawa, for December, 1917. †For a review of the water-power situation on the St. Lawrence River, consult report of recent annual meeting of the Commission of Conservation, Canada; also *Electrical News*, Toronto, 15th December, 1917.



ditions this, one of the greatest of our resources, would be an act of folly. If we are guilty of it, our children will be forced to pay an annual return upon a capitalization based upon the highest prices which our trains will bear. They will find themselves face to face with powerful interests entrenched behind the doctrine of "vested rights" and strengthened by every defence which money can buy and the ingenuity of able corporation lawyers can devise. Long before that time they may, and very probably will, have become a consolidated interest, dictating the terms upon which the citizen can conduct his business or earn his livelihood, and not amenable to the wholesome check of local opinion."

This prophecy of the ex-President is daily in process of fulfilment. In view of all the exigencies facing her—both national and international—Canada cannot afford to have great water-powers, like those of her boundary waters, pass into the hands of powerful private interests, but must retain full command of all the nation's resources.

Common Aims and Aspirations a Great Asset

Nothing is further from the thought of the writer than to suggest that it is, or that it would become, the arbitrary desire of the United States to deprive Canada of the coal which is present is so necessary to life in Canada. It is important, however, to take cognizance of the fact that a nation, pressed by the demands of its own people, may be compelled, under certain conditions, to deprive other nations—in part, at least—of even the necessities of life until the needs of its own citizens are met. No country can be expected to send out of its confines that which is essential to the very existence of its own people.

Canada is, indeed, exceedingly fortunate in being neighbor to a country whose national aims and sympathies are so akin to its own. Our great Ally to the south has extended to Canada specially generous consideration in the present coal shortage. Dr. H. A. Garfield, United States Fuel Controller, has announced that recognition will be given to Canada's needs for coal as though she were one of the States of the Union.

No one can contemplate the hearty efforts made to relieve the suffering begotten of the Halifax catastrophe without placing the greatest value upon the readiness of our neighbors to co-operate where assistance is really needed. In response to the distress of Halifax the governor of Massachusetts telegraphed accordingly: "The people of the Commonwealth of Massachusetts are ready to answer any call that may be made upon us. Massachusetts stands ready to go the limit in rendering every assistance you may be in need of." The governor of Maine telegraphed: "Any help Maine can give is yours," while many others sent corresponding messages. Sentiments like these, however, cannot better be summed up than in the inspiring message sent by President Wilson to:—

"His Excellency the Governor-General of Canada:

"In presence of the awful disaster at Halifax the people of the United States offer to their noble brethren of the Dominion their heartfelt sympathy and grief, as is fitting at this time, when to the ties of kinship and community of speech and of material interests are added the strong bonds of union in the common cause of devotion to the supreme duties of national existence."

Obviously, so long as such sentiments govern men's actions, the people living on the North American continent cannot be deprived of that which is essential to their existence; nevertheless, with the growing scarcity of coal, the United States, no matter what her goodwill or desire for exchange of commodities may not be able to cope with the prevailing need, and Canadians must be prepared to help themselves by the development of their own fuel resources in a way that they have never done before. There is no doubt that if this effort is made, the United States, in the spirit and disposition recently manifested in the statements above quoted, will see that Canada is fairly dealt with. We should not, however, trespass unduly upon friendly accommodation.

Coal Resources of Canada

The alternative open to Canada, and it is this to which special attention is directed, is to develop, and that as rapidly

as possible, her own fuel and power resources, and by co-ordination of transportation and other cognate agencies to provide for the early annual distribution, including reasonable reserves, of fuel to all communities in the Dominion. In some respects it is more important to move coal and have it adequately stored and distributed throughout Canada than it is to move the grain out of the country.

The coal fields of Canada may conveniently be divided into four main divisions:—

(1) The bituminous coal fields of Nova Scotia and New Brunswick.

(2) The lignites of Manitoba and Saskatchewan, and the lignites, sub-bituminous and anthracite coal fields of Alberta and the eastern Rocky Mountain region.

(3) The semi-anthracite and bituminous fields of Vancouver Island, Queen Charlotte Island and the interior of British Columbia, and the lignites of Yukon.

(4) The low-grade bituminous and lignites of the Arctic-Mackenzie basin.

The coal areas and estimated quantities for the different provinces are shown in the following table. There should, of course, for practical consideration, be a substantial reduction made in these quantities, due to waste in mining operations:—

Estimated Coal Resources of Canada*

PROVINCE	Area of Coal Lands Square miles	Semi-Anthracite Tons	Bituminous Tons	Sub-Bituminous Tons	Lignite Tons
Nova Scotia	524		10,791,000,000		
N. Brunswick	512		166,000,000		
Ontario	10				27,500,000
Manitoba	48				178,000,000
Saskatchewan	134,676				65,793,000,000
Alberta	81,278	845,900,000	217,915,000,000	312,953,000,000	20,092,000,000
Brit. Columbia	174,676		272,000,000,000		5,715,000,000,000
Yukon	2,540		77,000,000,000		5,370,000,000,000
Northwest Territories	900				1,500,000,000
Arctic Islands	6,000		6,600,000,000		
Total	111,164	845,900,000	312,973,000,000	312,953,000,000	11,178,000,000

(a) Includes some anthracite coal. (b) Includes some sub-bituminous coal. *Consult "Coal Situation in Canada" by W. J. Dick, in Transactions of the Canadian Mining Institute, 1916.

Canada's coal and coke production in 1916 was as follows*—

	1916 Short tons
Nova Scotia	6,932,149
New Brunswick	143,459
Saskatchewan	281,300
Alberta	4,559,654
British Columbia	2,584,661
Yukon	3,300
Total	14,483,395

Distribution of coal production:

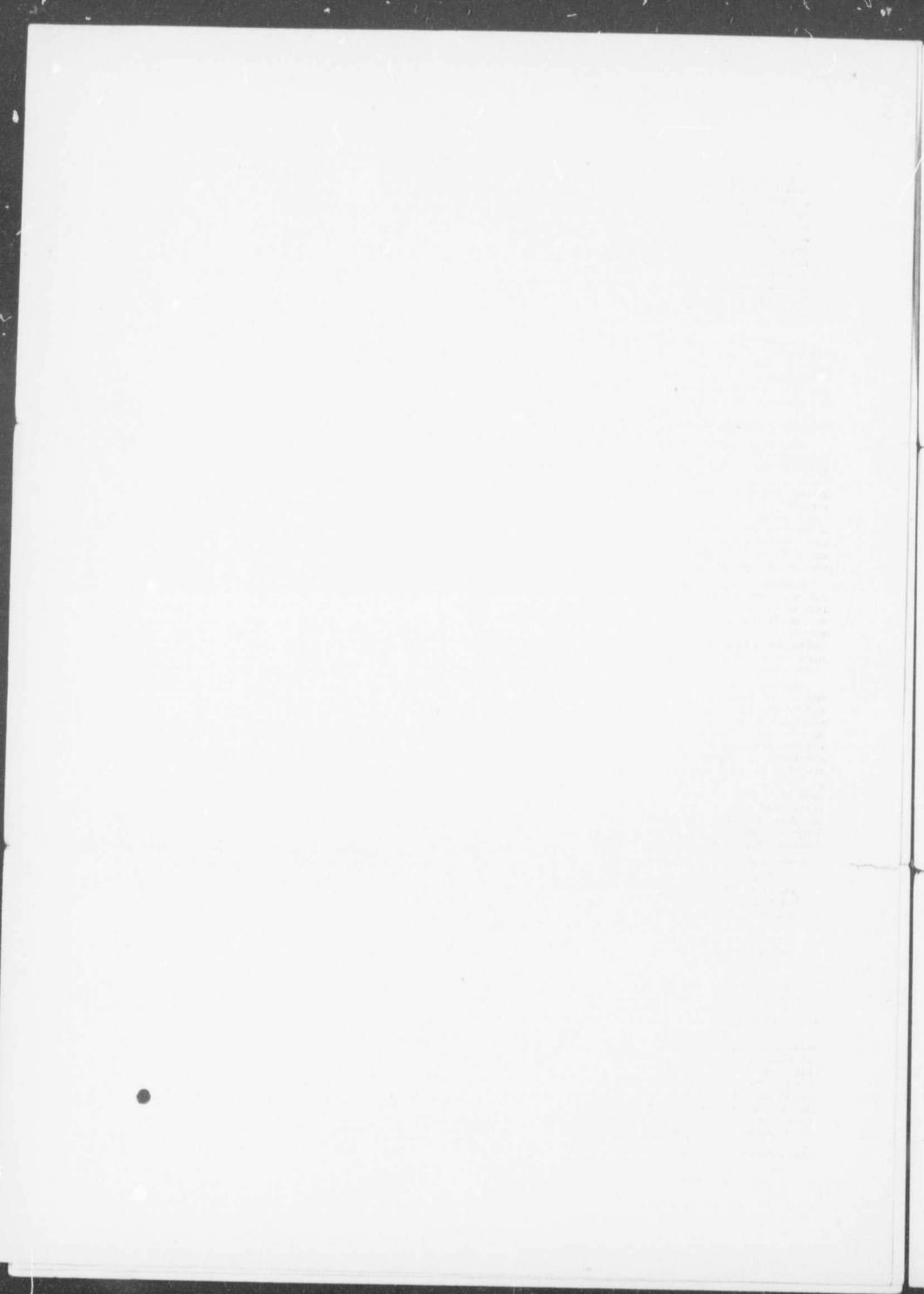
Sold for consumption in Canada	10,701,539
Sold for export to United States	1,451,675
Sold for export to other countries	284,513

Total sales	12,437,118
Used by producers in making coke, etc.	804,814
Used for colliery operation and by workmen	1,241,463
Total	2,046,277

Peat Resources of Canada

Respecting the peat bogs of Canada, Dr. Eugene Haanel, Director of Mines, Canada, from time to time, has strongly urged the necessity of developing our peat resources, and at the recent annual meeting of the Commission of Conservation of Canada he gave an able, forceful and serious address upon this subject which the people of Canada cannot too carefully consider. Dr. Haanel again affirmed the commercial and economic practicability of peat production. Throughout

*From figures issued by Mr. John McLeish, B.A., F.S.S., Chief of Division of Mineral Resources and Statistics, Ottawa.



Canada there have already been discovered areas of peat bog estimated to aggregate 37,000 square miles. According to a broad estimate by Dr. Haanel, and assuming an average depth of bog of six feet, this area corresponds to over 28,000,000,000 tons of peat, having a fuel value equivalent to over 10,000,000,000 tons of good coal. Manitoba, Ontario, Quebec and New Brunswick have peat bog areas aggregating 12,000 square miles.

Canada Must Bestir Herself Respecting Her Fuel Resources

Anthracite coal as a fuel is a luxury. Within the last twenty-five years many farmers and citizens especially in outlying communities who formerly utilized only wood, now use anthracite coal. It became easier and more convenient for the farmer to haul his coal from the railroad siding than to go into the bush and chop his year's supply of wood. Now, what opinion would be expressed respecting a farmer who allowed his family to suffer great privation, through failure in the supply of anthracite coal, if within ready access was a wood lot from which ample fuel supply could be obtained? Obviously, the opinion expressed would be that the farmer had better take up his axe and make available such fuel supply as was within his reach and control.

This illustration is not offered by way of suggestion that farmers and many others may find full relief by resorting again to "the woodpile." It is, however, applicable to Canada at large. A great portion of this Dominion, like the farmer, has become dependent upon others for coal. If this supply is gradually, but seriously, curtailed, or even finally cut off, there is no more excuse for Canada remaining unsupplied with fuel than for the farmer in the case of our illustration. We have already cited the extensive character of the undeveloped fuel resources of this Dominion.

Canada, even though she may regret being deprived of the luxury of clean-burning anthracite coal or the easily-delivered bituminous coal, must, nevertheless, arouse herself and bestow the necessary intelligent labor upon her own fuel resources in order to make them available for her national needs. Absolutely, no time is to be lost. Governments—both federal and provincial—in Canada should utilize to the fullest possible extent the results of research and investigations already made; the knowledge of which is possessed by able members of a number of government departments.

It is not the intention again to emphasize the distress which is at present upon the country in connection with its annual fuel supply from the United States. Canada has had repeated warnings in this respect. The lessons of the coal shortage of 1902-1903 were soon forgotten. The indications in 1915 were unmistakable for a shortage in 1916; conditions in 1916 indicated a worse state of affairs for 1917; and present conditions forebode increasing distress for 1918. Let it be appreciated that Canadians need never expect to have electrical energy replace coal and other fuel for heating purposes except to a relatively limited extent.

The present coal shortage, with its perplexing difficulties, is being ably and conscientiously dealt with by Canada's Fuel Controller, Mr. C. A. Macgrath. Hence it is more the purpose of this statement to draw attention to the fuel and power situation in its broad national and international issues.

Fuel Problem Can be Solved

Once a broad national policy has been determined, financial and other assistance should be promptly rendered to enable sane and businesslike development of Canada's lignite, peat and other fuel resources for the benefit of the nation, to be carried out by competent technical officials entrusted with this great and honorable responsibility.

There is no need to start again learning the A. B. C. of this fuel problem. Officials of the government of Canada, such as those in the Geological Survey, Department of Mines, the Commission of Conservation and other organizations, have knowledge of existing conditions and of practical means by which much of the stress may be relieved. To carry out these measures of relief and to place Canada in a reasonably independent position with respect to fuel will take time; but there is no doubt that if matters are dealt with in a broad, statesmanlike manner, and the necessary encouragement of financial and other assistance is given to those who are competent to handle same, Canada will, at a minimum of effort and expense, be relieved of a menace with respect to her coal supply which threatens not only her economic life, but the physical life and well-being of a large proportion of her citizens.

Statements to the effect that we cannot afford to produce and transport our peat or our lignites, because the cost may be even a few dollars more a ton than imported coal, are simply ridiculous. Anthracite coal, due to war conditions, is now practically unobtainable in the countries of Western Europe. In the winter of 1916, for such coal as was available, France was paying about \$40 per ton and Italy \$50 per ton. Recent reports from these countries state that coal at present is selling at \$60 per ton. Now, Canada imports annually about four and one-half million tons of anthracite from the United States. Suppose that circumstances prevailed for a year such as would make the citizens of Canada willing to pay even a fraction of the advance in European countries—say, \$10 advance—this would amount to about \$50,000,000. When one thinks in such terms of increased yearly outlay, surely a million dollars, or even a few millions of dollars if necessary, placed at the disposal of technical officers, assisted by men of sound commercial judgment, in order to get our own lignite and peat resources under national development, constitutes so intrinsically small a sum in comparison to the results as to be practically unworthy of debate.

From the foregoing we clearly perceive that there is no need for Canada, with her vast resources of fuel and water-power, to go cold or to have her industries throttled by reason of power shortage; but Canada may have a sore trial in both these respects unless every possible effort is speedily made to deal with the fuel and power situation in a comprehensive manner.

Shall it weakly be said, "There is a lion in the way?" or, with confidence in Him to Whom belongs "the earth and the fullness thereof," and who ever guides men in all honest effort, will Canadians forthwith assume the responsibility of this fuel question and unite in energetic action until this great national problem is satisfactorily solved?

EXTRACT FROM WHO'S WHO IN THE ANNUAL NUMBER OF THE MONETARY TIMES, JANUARY 4, 1918.

WHITE, ARTHUR V., Toronto. Formerly consulting engineer with Brown Brothers, London, England, for whom he executed commissions in France, Belgium and the United States, travelling for a number of years, extensively in connection therewith; later with Mr. R. A. Ross, of Montreal, for whom he executed work connected with the field investigations of the Ontario Power Commission, the precursor of the Hydro-Electric Power Commission of Ontario. Later, Mr. White was with Department of Public Works, Canada; for several years past he has been consulting engineer to International Joint Commission, Ottawa and Washington, on the Lake of the Woods Investigation; also consulting engineer to Commission of Conservancy, Canada, with whom he has for many years persistently been urging that Canada take prompt and statesmanlike action with respect to her grave national fuel and power problems.