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DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

JOSEPH A. HOLMES, DIRECTOR

ALASKAN COAL PROBLEMS

BY

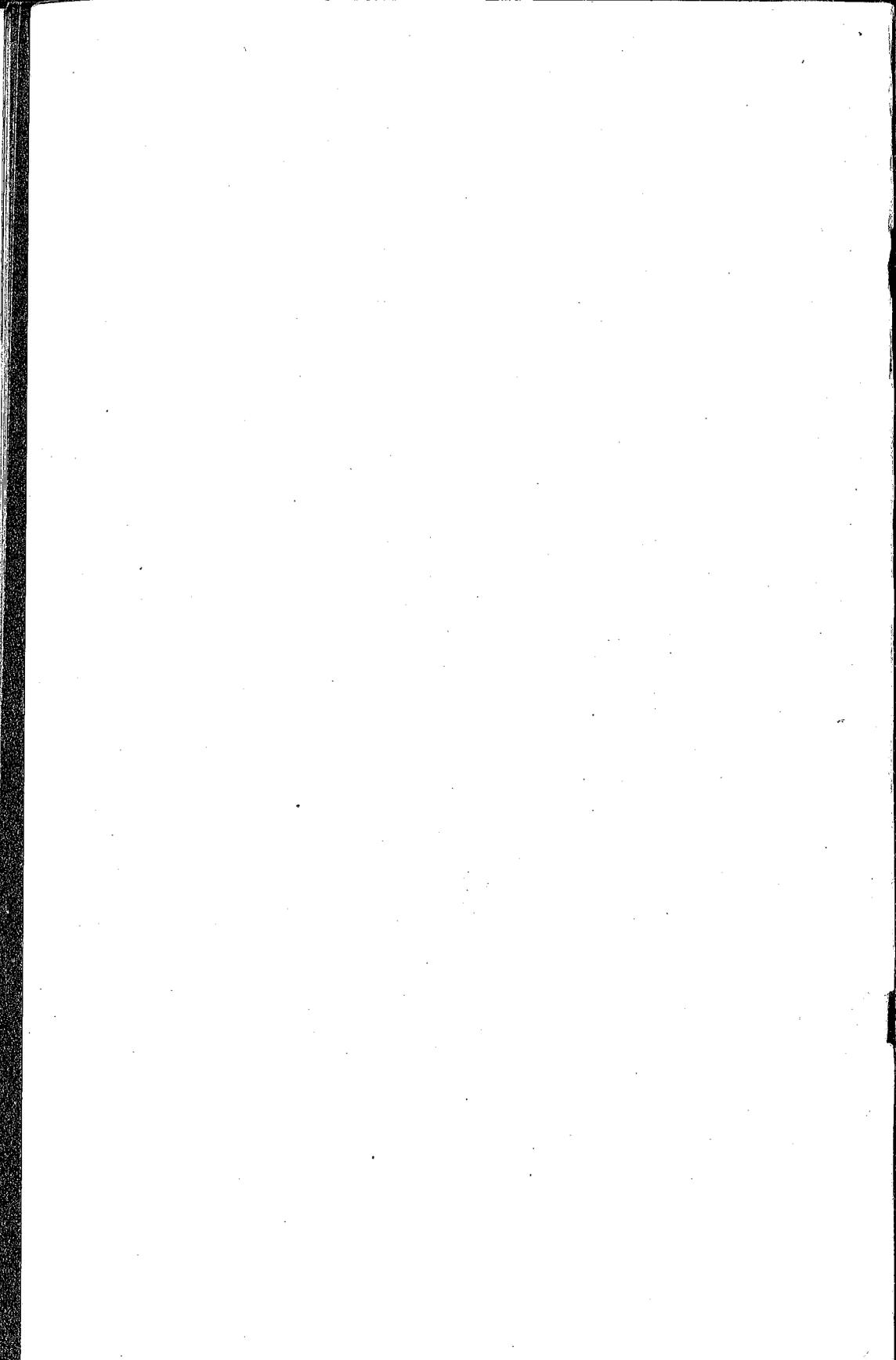
WALTER L. FISHER

SECRETARY OF THE INTERIOR



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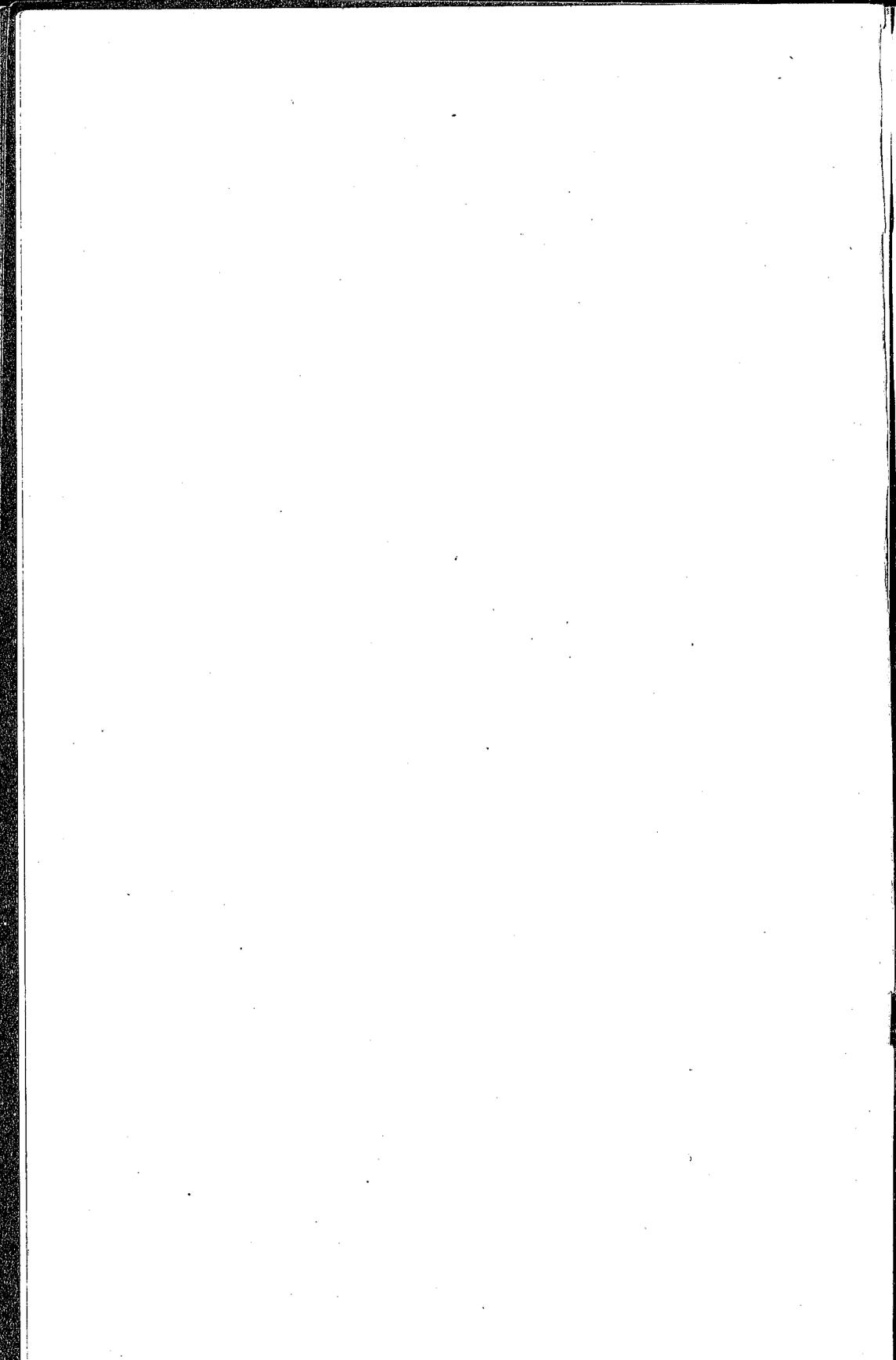


CONTENTS.

	Page.
Preface.....	5
Introduction.....	7
Need of adequate mining laws and transportation facilities in Alaska.....	8
Alaskan coal.....	10
Probable markets for the coal.....	10
Bering River coal field.....	12
Use of coal by copper smelters.....	13
Railroads and harbors for the Bering River field.....	13
Matanuska coal field.....	18
Transportation facilities for the Matanuska coal field.....	18
Methods of opening the Alaskan coal fields.....	22
Some advantages of and objections to the leasing of coal lands.....	23
Conditions to be incorporated in coal leases.....	26
Experience with coal leases in Australia and New Zealand.....	28
Opinions regarding the leasing of coal lands in Alaska.....	30

ILLUSTRATION.

PLATE I.—Map of Alaska, showing distribution of mineral deposits..... At end.



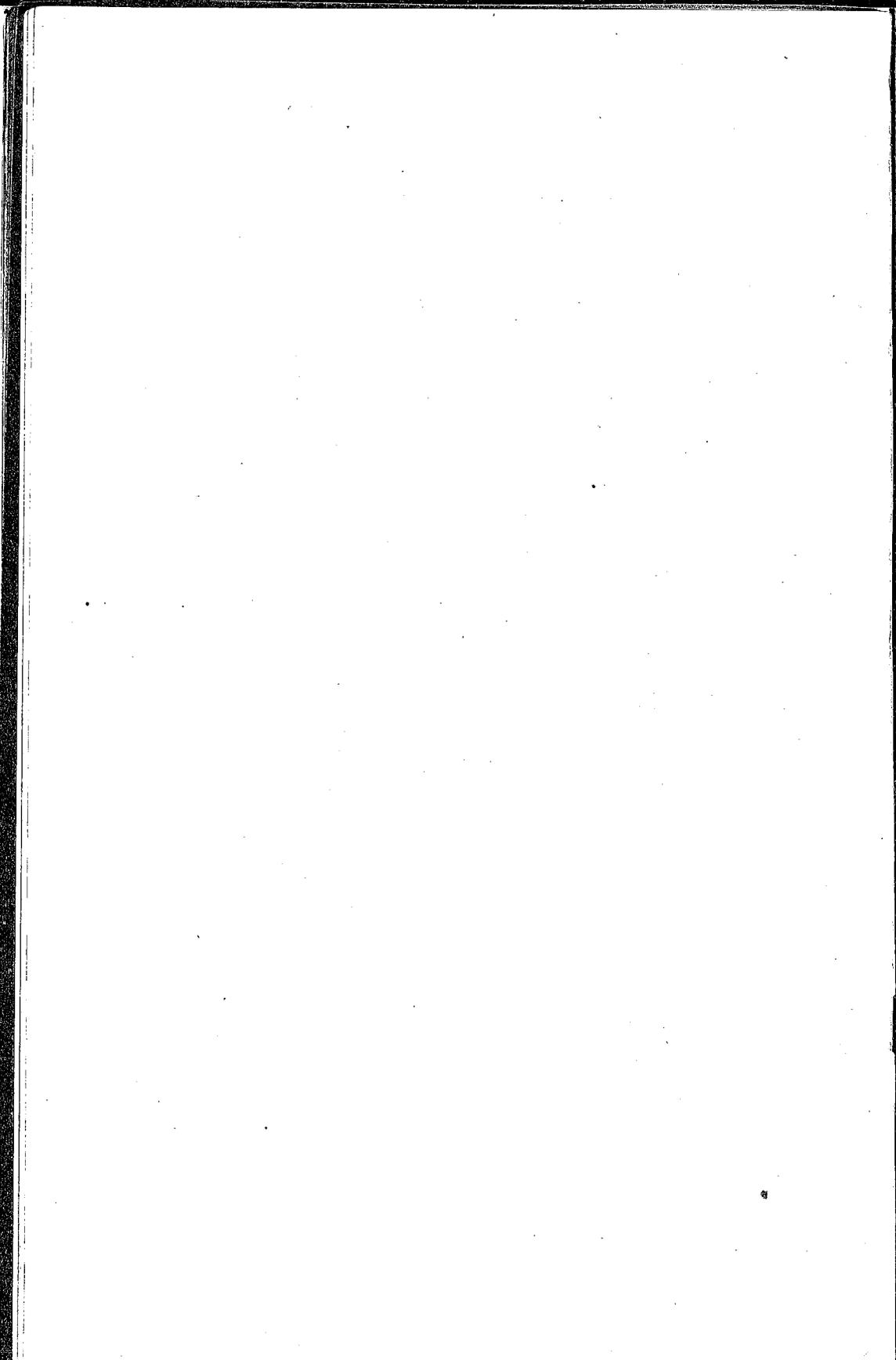
PREFACE.

By JOSEPH A. HOLMES.

The accompanying address, in slightly different form, was delivered by the Secretary of the Interior before the American Mining Congress at Chicago, Ill., on October 27, 1911. It embodies, in addition to the results of the Secretary's personal examinations in Alaska, results of investigations conducted by the director and certain engineers of the Bureau of Mines during the summer of 1911, and of more extensive investigations, covering several years, made by geologists of the Alaska division of the United States Geological Survey. The facts brought out in the address relate to the mining conditions and the possible mining operations in the two more important Alaskan coal fields, namely, the Bering River field and the Matanuska field.

Many of the problems involved in the efficient mining and utilization of the coal in the two fields mentioned and in other Alaskan coal fields come within the province of the Bureau of Mines, since this bureau is not only authorized to carry on investigations relating to methods of mining and to the utilization of fuels, but is also charged with the inspection of mines in Alaska. Among those who are most interested in these mining problems and who should be most helpful in their proper solution are the engineers and the coal operators of the country.

There will necessarily be some delay in the formal publication of the data collected by the Bureau of Mines; consequently, this statement by the Secretary of the Interior is now published by the bureau to meet the large demand for immediate information. The statement gives a summary of information concerning the quality of the coal in the two fields discussed and of the problems involved in the mining and utilization of this coal. It is accompanied by a map of Alaska, prepared by the United States Geological Survey, showing the distribution of the various coal fields.



ALASKAN COAL PROBLEMS.

By WALTER L. FISHER.

INTRODUCTION.

The public interest in the Alaskan situation is such that, with the consent of the President, I have concluded, at the request of the American Mining Congress, to make at this time a candid, if somewhat informal, expression of the views I have formed as Secretary of the Interior, under whose official supervision much of the administration of the Territory is now placed. Pressure of other matters imperatively requiring attention has prevented their presentation in as precise and comprehensive a form as I had hoped. The absence of the President from Washington has also prevented the submission to him of what I have prepared. I wish to say, however, that no one is more earnest than he in the desire to see a policy of prompt and wise development inaugurated in Alaska, and that the general policy contained in this address has been discussed with him, meets his approval, and will have his support.

I have recently returned from an altogether too brief but nevertheless a most interesting and profitable visit to those portions of Alaska that are more immediately involved in the questions now under public consideration. Favored by extraordinary weather and the cooperation of steamship and railroad lines and the assistance of all of the governmental agencies, including the Revenue-Cutter Service, I visited every port in Alaska that seems likely in the near future to become an important entrance to the country. I examined all of the harbor and town sites which for this purpose have attracted any considerable public attention. I traversed the entire length of each of the three railroads that have been constructed in the Territory and made a short trip from White Horse down the upper Yukon. Both before and during the journey I examined a mass of books, records, and papers relating to the country and its resources. I had conferences with official committees representing the principal communities I visited and with numerous individuals, residents both of the coast and of the interior, and conferred with engineers, miners, prospectors, railroad officials, business and professional men.

I had the good fortune to have with me throughout the entire Alaskan trip Alfred H. Brooks, geologist in charge of the Alaskan division of the United States Geological Survey. For 14 years Mr. Brooks has been studying Alaskan conditions on the ground; for nine years he has been in charge of the mineral division of the Geological Survey work there. I had arranged for Dr. J. A. Holmes, Director of the Bureau of Mines, to precede me to the Bering River coal field, which he examined thoroughly before joining me at Cordova. In the examination of the Bering River field Dr. Holmes was accompanied by L. T. Wolle, of Ohio, an engineer of large experience both in coal mining and railway construction; F. W. C. Whyte, of Montana, whose coal-mining and railway experience has been extensive in the management for years of the coal developments and operations of the Anaconda Copper Mining Co.; T. H. O'Brien, who for a number of years has been organizing and managing the coal operations of the Copper Queen, Stag Cañon, and other companies in the Southwest; and George Watkins Evans, a coal-mining engineer of experience in the Northwest States, who had already made several professional examinations of the Bering River coal field. To these gentlemen I am greatly indebted for the valuable service they have rendered in this connection. In his subsequent examination of the Matanuska coal field Dr. Holmes was accompanied by Mr. Whyte and by Sumner S. Smith, who is a mining engineer and the inspector of mines for Alaska.

At the very outset I wish to express the high opinion I formed of the remarkably large and fine body of people who have become permanent residents of Alaska. While there is unquestionably a considerable floating population of a character that does not add to the real strength or stability of the Territory, there is a substantial percentage of vigorous, law-abiding, law-respecting men and women of the highest type of American citizenship, and I found that they possessed what is perhaps the highest form of moral courage—the ability and the willingness to look at both sides of the questions which affect their interests and to admit that they are wrong when once convinced that they have been led into a mistake of fact or of opinion. The total population is about 65,000 persons, of whom a little less than half are whites. They are entitled to a Territorial government better adapted to their peculiar local conditions and needs.

NEED OF ADEQUATE MINING LAWS AND TRANSPORTATION FACILITIES IN ALASKA.

The existing coal-land laws applicable to Alaska neither promote development nor protect the public, and all its coal fields are withdrawn from entry. Numerous claims under entries made or attempted to be made prior to the withdrawal are pending in the De-

partment of the Interior. Their investigation is now being pushed as rapidly as possible, and wherever indictments are not pending they will be decided as promptly as this can be done properly.

I found Alaska a country of wonderful scenic beauty, which in itself will in future years be one of its greatest financial assets. From all the information I could gather, I believe it to be a country of great mineral and agricultural possibilities; indeed, I should go further and say a country of great mineral and agricultural probabilities, needing development, ready for development, and inviting development, but held back chiefly by inadequate transportation facilities and inadequate laws.

Its present steamship lines are probably as good as could be expected, in view of the restricted commerce and the inadequate manner in which its coasts are marked and lighted. Its present roads are almost entirely those which have been built out of the meager appropriations made by Congress for this purpose. Travel by road or trail in Alaska is still generally of the roughest pioneer description. Its present railroads are incidents to the exploitation of its mineral resources.

Aside from the White Pass & Yukon road there is only one real railroad in Alaska, and that is the Copper River & Northwestern Railroad, which leads from Cordova, on Prince William Sound, 200 miles up the Copper River, and its eastern tributary, the Chitina, to the Bonanza copper field, and is reported to have cost approximately \$20,000,000. The White Pass & Yukon Railroad is an excellent narrow-gage road along the line of the historic trail that leads over the mountains and down the Yukon to the gold fields of the Klondike, but only a small part of this railroad is in the territory of the United States. The Alaska Northern Railroad starts from Seward for the Matanuska coal fields and the Yukon, but stops, discouraged, 71 miles north of Seward. The present cry in Alaska and among those who are financially interested in Alaska is that development has been stopped by the withdrawal of the coal fields from entry. I am convinced that the coal withdrawals have exerted only an incidental influence upon the development of railroads in Alaska. Even if the withdrawals had not been made, the enforcement of the restrictive provisions of the present law and of the act of 1904 would have had substantially the same effect as the withdrawals themselves. The critics of the withdrawals are usually either those who do not realize the prohibitory effect of the coal laws in Alaska or those who have assumed that these laws could be violated with impunity. If the coal fields had remained open to unrestricted private exploitation, railroad development might have been stimulated, but in that event the profits of the coal and not of the railroads would have been the incentive to construction.

We have already seen in this country the injurious effects of the joint or common ownership of coal fields and railroads, and we are now engaged in the attempt by drastic legislation to remedy the evils which the withdrawal of the coal fields of Alaska should prevent from recurring there. We should not repeat in Alaska or elsewhere the mistakes that have been made in the older portions of the United States. This does not mean that Alaskan coal should not be developed and developed at once. It means merely that the coal should be developed properly as well as promptly.

ALASKAN COAL.

Alaskan coal is of great value, but its extent and character have been much exaggerated. There are great quantities of lignite and low-grade bituminous coal in several parts of the Territory, but there are only two fields of accessible high-grade coal known in Alaska. Their location is shown on the accompanying map (Pl. I). The better known of these two fields is the Bering River field, which is near Controller Bay, and in which the Cunningham claims were located. It is the field about which the Alaskan controversy has been fiercest and most bitter. The Matanuska field is larger and may prove to be the more important. Both of these fields contain anthracite and high-grade bituminous coals. The question is how they shall be opened so as to promote development and protect the public interests. Before answering that question it is necessary to consider the general conditions that now exist and the real end that we wish to attain. Alaskan coal can be opened so as to enable a larger or smaller number of individuals or groups of individuals to make money out of its development, bringing with this development considerable incidental benefit to the community as a whole through the expenditure of money and the employment of men, or it can be opened on terms which will offer to the operator a sufficient profit to furnish an adequate incentive for his investment and his efforts, but which will result in placing the coal upon the market at the cheapest price consistent with this incentive, conferring upon the community the manifold advantages of cheap fuel and of the development of the many forms of industrial enterprise that cheap fuel renders possible.

PROBABLE MARKETS FOR THE COAL.

I think there can be no room for doubt that the second of these objects is the one to be attained. If, however, Alaskan coal is to be mined and sold under any plan, it is important to know what is likely to be the present and future market. There is at present on the Pacific coast no available anthracite except that in Alaska. It would be natural, therefore, to expect an immediate demand for this

particular kind of coal. There is little high-grade bituminous coal on either the eastern or western border of the Pacific, and it would be natural to expect a considerable demand for coal of this character. There is little, if any, high-grade coking coal on the Pacific coast unless in Alaska, and there is an immediate demand for a certain amount of coking coal for smelting copper and other ores. There is, of course, a certain present limited demand in Alaska for coal for steaming purposes. The amount used for all purposes during the last fiscal year was 116,000 tons. Except for coking use, it is clear, however, that Alaskan coal must now contend with serious competition. There are considerable quantities of lignite and low-grade bituminous coal throughout the lower Pacific Northwest and in British Columbia. Much of the bituminous coal is of fair quality. When freight and handling charges are taken into consideration it is clear that for steaming purposes the coal of British Columbia and of the Northwestern States will hold everything but the Alaskan market itself against competition from any of the Alaskan coal except that of the very highest grade, and coal of this quality can expect to win only where special considerations control.

For ordinary heating and steaming purposes it is always possible for low-grade coal at lower prices to control the market. But for these purposes the most serious competitor of Alaska coal is California oil, which is already supplanting coal in many fields and possesses advantages in economy and convenience of handling. The most reliable estimate as to the life of the California oil fields of which I have any knowledge is that they will be an active competitor for the entire heat-producing market for the next 50 years. Oil has already supplanted coal on many of the western railroads, and is now being installed in the railroads and steamships of Alaska and the Pacific coast. Whether it will be possible for Alaskan coal to compete with it, once the necessary changes in the boiler equipment have been made, is exceedingly doubtful. Oil, however, is a less dangerous competitor in smelting and in making steel. It is not now used for either of these purposes, except experimentally.

Extensive deposits of copper are already known to exist in Alaska, and smelters will undoubtedly be established in that country as well as farther south upon the Pacific coast. Some iron exists in the Pacific States, and there are numerous indications of its presence in Alaska, although commercial development there is as yet practically negligible. My own judgment is that the present market for Alaskan coal is limited and uncertain, but that the demand will rapidly increase as the country is developed. There are now the local needs of a comparatively small population and comparatively few industrial enterprises. There is also some demand for high-grade coal on the Pacific coast, which Alaska alone can meet.

If the mines are opened there should be, and in my opinion there will be, immediately established on Prince William Sound one or more smelters capable of smelting the copper ores which are now being mined and of taking care of the development of this ore which seems sure to come in the early future. There will be at some time a demand for coke for making steel; and if adequate transportation facilities are furnished so as to permit of the development of the iron and other minerals which probably exist in the country there will be an increasing demand for coke for these and for the ores of the lower Pacific. After all, however, important as these needs and opportunities are, it seems reasonably clear that Alaskan coal will not dominate the coal market of the Pacific coast as it was confidently thought it would when the fields were first discovered. That this is true will be apparent upon a further consideration of the physical condition of the coal fields and of the coal itself.

BERING RIVER COAL FIELD.

I personally visited the Bering field and examined some of its coal beds and coal mines. It is located along the foot of the Chugach Mountains, in the region a little south of Prince William Sound and some 1,200 miles from Seattle. The fields cover an area of 50 square miles or 32,000 acres, lying approximately 25 miles from the coast at Controller Bay with an immense glacier, known as the Bering Glacier on the east from which the Bering River runs and empties into Controller Bay. This field was discovered in 1896 and practically all of it appears to have been covered by claims entered under the law of 1904. The country is exceedingly rough and broken and the rocks are faulted and folded to an extraordinary degree.

In addition to the titanic upheavals which must have occurred at this point, the stratification has slid or moved within itself in such a way as to crush the larger portion of the coal beds in this field, leaving what otherwise would have been the highest grade of bituminous coal so that much of it can not be mined as lump coal, but only in a finely crushed condition. There is, however, some coal in the field that doubtless can be mined as lump, but how much there is of this coal remains a question of considerable doubt. This doubt is further intensified by the fact that in the crushing process the coal beds have become pinched so that beds of considerable thickness at one point become thin or even pinched out within a short distance, making it difficult to determine what will be the condition of the beds at any given point beyond the explored area. All of these conditions will add materially to the cost of mining, which will be further increased by the fact that the coal itself can not be relied upon to support the roof of the mine and that resort to

timbering will have to be had to an unusual extent. Although the local timber is of poor quality, it will probably answer for ordinary mining purposes, but the cost for labor will be high. Aside from its crushed condition, much of the coal itself is of excellent quality, possessing high thermal value. The crushed condition does not impair the coking quality if the coal is otherwise good. Although the coal can be briquetted, or with the use of specially constructed furnaces it can be burned successfully in its present form, its physical condition will undoubtedly interfere with its immediate commercial value. The erection of smelters on Prince William Sound will cause an immediate demand for this coal, as the first smelters will probably be erected at or near Cordova, the tidewater terminal of the Copper River & Northwestern Railroad which now taps the principal copper field of the Territory.

USE OF COAL BY COPPER SMELTERS.

One of the pressing needs of the Territory is the construction of such smelters at which the copper ore especially can be smelted without the labor and expense of transporting the ore the enormous distance now necessary for this purpose. The main purpose and practically the only present use of the expensive railroad from Cordova up the Copper River is the transportation of the ore from the so-called Bonanza copper field in which the Morgan-Guggenheim syndicate, which owns this railroad, already has extensive interests. No smelter, however, has as yet been constructed, and none would be profitable until the coal and the copper can be brought together. Once the Bering coal fields are open the transportation problem becomes in this, as in other respects, the most important problem, upon the solution of which future development will depend. The enormous expense of railroad construction through the mountainous and glacier-covered territory makes it practically certain that the Copper River Railroad will remain the natural distributor for any of this coal for which there may be a demand in the interior of the particular district in which it is located. I think it may be assumed, not only from the statements made to me by its officials, but also from the very nature of the case, that the people interested in this road will construct smelting works at Cordova as soon as Alaskan coal is available for use there. Smelters at Cordova would be able to take care of the copper ores, of which there are many indications throughout the entire district tributary to Prince William Sound.

RAILROADS AND HARBORS FOR THE BERING RIVER COAL FIELD.

The exploitation and commercial development of these ores would promptly follow the construction and operation of such smelters.

Representatives of the Copper River Railroad state that they will construct a branch line to the Bering coal fields as soon as these are opened to development. Under these circumstances it is natural to inquire what, if any, advantages there would be in the construction of another railroad from tidewater to these fields. The answer to the question depends largely upon how effectively the Government will be able to make proper regulation of the service and the rates of the Copper River road. Such regulation, however, should be comparatively simple and effective, especially if we insist upon keeping the railroad or its owners from acquiring a controlling interest in the coal fields. That this can be done by a proper system of leasehold I see no reason to doubt. Representatives of the railroad have assured me that its owners recognize and intend to accept in good faith, so far as the coal fields are concerned, the principle upon which public opinion and the law now insist in the States and will undoubtedly insist in Alaska—the principle that transportation lines should not be interested, directly or indirectly, in the commodities which they transport. Whatever may be thought of such assurances, the law itself should divorce the railroads from the coal business, so that all the lessees of coal lands may receive impartial service from the roads and the incentive to favoritism may be removed. If this can successfully be accomplished, it is apparent that a competitive railroad will simply divide the profits of transportation, which are now not adequate to pay the cost of operation and whose future can not be foretold with any certainty because of the doubts as to the market for the coal, to which reference has already been made.

There is, however, abundant opportunity for competitive roads if they should ever become desirable. Not only is there room at or near Cordova for competitive terminals, but there is ample frontage reserve for a Government railroad if one should ever be desired. The harbor at Cordova is so clearly superior in all respects to any other harbor available for the Bering coal fields that the slightly longer transportation necessary by this route appears unimportant, especially as the grade is practically a water grade to the coal fields. Nevertheless, there is a possible harbor, although a poor and expensive one, available at Controller Bay. This much-discussed bay, tempest tossed by controversy as well as by nature, is inclosed partly by rocky remnants of the hills and partly by low reefs built up of mud brought down by glacial streams and raised above the water surface by action of the waves. The bay itself is gradually being silted up by similar material from the same extensive glaciers which border the coal fields on the north and east and probably cover many beds of coal. These long, low reefs and flats, together with the islands of Kayak and Wingham on the southwest, protect its

waters from the open sea. The area from the base of the coal-bearing mountains on the north, along the east side of Bering River, to the bay, a distance of 15 to 20 miles, is a low-lying plain but a few feet above water level, much of it flat and swampy, built up of glacial débris.

The entire bay is shallow except a narrow, irregular channel from a few hundred yards to a mile in width and a few fathoms in depth leading southward and westward to the sea. The tidal currents passing into and out of the bay diminish the settling of glacial silt in this channel, but these do not appear to prevent the silting up of the larger part of the bay itself; and doubtless the channel is slowly but continuously becoming smaller and more shallow. This channel lies 2 to 3 miles out from the present shore, with these shallow mud flats intervening. Of course, whether and how rapidly the large quantities of silt brought down from the glaciers will continue to fill up the waters of Controller Bay can only be determined by careful and protracted observation, but there is every reason for believing that this process will continue in the future as it has done in the past unless the conditions are improved by artificial construction and dredging.

I should add, however, that some persons insist that the future deposits brought down by the Bering River will in no appreciable way affect the navigability of the bay; and that the conditions can be easily improved by dredging. As the Controller Bay region is only 20 to 30 miles distant from the coal fields, there have naturally been numerous investigations to determine the possibility of constructing harbor facilities there. I am told that it was carefully investigated on behalf of the Copper River Railroad by engineers of high standing and was discarded as impracticable. The attempt, however, was made under the advice of engineers of this road to construct a harbor at Katalla, which is outside of the range of islands to the westward of Controller Bay, where there is deep water immediately offshore and where a pier or breakwater was constructed at considerable expense in the vain attempt to protect shipping from the force of the winds and waves of an open roadstead. A storm promptly demolished these works and led to the removal of the railroad to Cordova. Its representatives say they would not now construct a harbor at Controller Bay even if they should become interested in a railroad to the coal fields, and give as an added reason the necessary duplication of dock facilities which they are now constructing at Cordova.

Obviously, if modern dockage is provided at Cordova for copper ore and other heavy freight, it can be made to provide for coal with less additional expense than if separate facilities should be constructed on Controller Bay. Nevertheless, several other rail-

road enterprises have been projected at Controller Bay, but apparently all have become inactive except that in which R. S. Ryan and his associates are interested. It was the persistence of Mr. Ryan which led to the elimination of the shore of Controller Bay from the Chugach National Forest, and he has made three scrip entries on the shore, which are still pending before the Department of the Interior. Following the law, these entries each have a frontage of 160 rods, leaving 80-rod intervals between them, which the law provides shall be kept free from entry. On one of these 80-rod strips a railroad terminal has been located, but this entry appears to be without any warrant of law and is based wholly upon the theory that a railroad-terminal location does not constitute an entry within the meaning of the act. It seems to have been made merely to exclude others and upon the chance that the statute may be open to the construction mentioned. I do not believe that it is even intended to be seriously pushed.^a At all events, all the rest of the shore, except as stated, remains free from entry, thus disposing effectively of the claim that a railroad monopoly has acquired the frontage of Controller Bay. Whatever may be the merits or demerits of this harbor, it has not passed out of the control of the Government.

To develop the harbor at all it will be necessary to construct piers or roadways from the shore out over the shallow flats to the channel I have described; and after the elimination from the national forest Ryan obtained from Congress, without apparent objection from any source, a special act containing many provisions for the protection of the public interests, permitting him to construct a pier with dockage facilities where it reaches the deeper water. Here, 3 miles from the shore, he proposes to create a harbor. Similar facilities can be created at other points along the shore if this should be desired, and by dredging, a certain amount of which Mr. Ryan admits he will have to do, facilities just as advantageous as his can apparently be created, if desired. Ice from the Bering River and other small streams forms in winter and collects in the shallow waters of Controller Bay. Some of those familiar with Alaskan conditions, whose opinions are entitled to weight, regard this ice as a menace to the harbor, but the greatest disadvantage, aside from the shallow waters, appears to be conceded to be the fierce winds which sweep down over the bay from the glaciated regions on shore. Under somewhat similar conditions elsewhere, shipping is said to be actually blown from the docks in extreme cases; and if winds of this character should blow while vessels were attempting to enter Controller Bay the danger would be great.

^a Since this address was delivered the Controller Railway & Navigation Co., Richard S. Ryan, president, has filed a formal relinquishment of this terminal location on the 80-rod strip.

Mr. Ryan has recognized the difficulties and thinks they can be met, at least so far as the docks are concerned, by constructing them so that ships will dock with their bows directly facing the prevailing winds. The plans which he has recently prepared are so drawn. That such precautions are necessary even in his judgment is a sufficient indication of the importance of this particular problem. If he should really construct a road and extend it from the coal fields to a connection with the Copper River Railroad, copper ore might be diverted either by enforced or voluntary switching arrangements to smelters established in the coal fields themselves or at Controller Bay, but these smelters would not possibly be as available for the copper ores of Prince William Sound as would smelters at Cordova. For the reasons which I have thus indicated, I am unable to see how a railroad at Controller Bay would be of any particular advantage to the Alaska syndicate, and if a real competitive railroad should be built, it would serve as a check upon the Copper River road. If, on the other hand, a Government railroad is desirable now or in the future, there is ample opportunity for it. If the Ryan railroad should be built and the Government desired its acquisition, the opportunity for the Government to build a competitive road should be effective in preventing an exorbitant price.

However, under the conditions which exist, including the character of the Bering coal fields, the present state, and the immediate future of the coal market, and the fact that the Copper River Railroad is already in the field, I see no reason why the Government should at this time take upon itself the unnecessary financial risks of supplying transportation. If railroad rates and service can ever be effectively regulated, this can be done in the case of a railroad carrying but a single commodity between fixed points, as would be the case with the Ryan railroad, or carrying but few commodities and those chiefly in bulk, as is now the case with the Copper River Railroad, and is likely to be the case with it for many years to come. While I am an optimist as to the future of Alaska, I see no reason why the Alaska syndicate should not be permitted to continue the enormously expensive experiment to which its present investment has already committed it and which that investment prevents it from abandoning. The essential thing is that we shall adopt proper coal laws under which monopoly will be impossible and that we shall preserve ample opportunities for whatever action by the Government the future may require. Adequate facilities for the storage and transshipment of coal must be furnished. The immediately important thing is that the Bering coal field shall be open to wise development so that it may supply local needs and afford ample opportunity for supplying any market for this particular coal which may now exist or which it may be possible to create on the Pacific coast.

MATANUSKA COAL FIELD.

My visit to Alaska has led me to take a far greater interest in the future of the Matanuska coal field, which is larger in extent, having an area of 74 square miles, or 47,360 acres, better in coal, better in physical condition, and freer from the complications of private claims than is true at Bering River. Against these advantages must be set off its greater distance from the sea, but this very distance connects it more intimately with the real problem of Alaskan development—that of adequate transportation from tidewater to the Yukon. What Alaska needs more than all else is a trunk-line railroad from the ocean to the great interior valleys of the Yukon and the Tanana, opening up the country so that its future development may really be possible. To-day, as I have said, Alaska is a country of large probabilities, minerally and agriculturally. Mineral resources of great variety and extent are indicated by such surface exploration as is possible. The real value of these mineral indications, however, can not be effectively determined while the cost of transporting even the simplest of mining machinery into the interior is practically prohibitive and can be justified only as a gigantic gamble by men of sufficient means to pocket their losses. The vast interior valleys are covered with luxuriant grasses and can be made to raise cattle and sheep, and even grain if proper seed and proper methods are experimentally developed by scientific agriculture. But agricultural development can not go forward where the local markets are small and scattered and exportation is impossible.

The Matanuska coal field lies north of Prince William Sound and from 150 to 200 miles from Seward, on Resurrection Bay. It is known to contain extensive beds of coal of the same quality as or slightly superior to that of Bering River, and in better physical condition both as to the coal itself and as to the obstacles to profitable mining. The country is not so broken, faults and pinching are less in evidence, and the crushing process appears to have gone on to a much less extent, although comparatively few openings have been made, and intrusions of igneous rocks occur in places, so that the cost of recovering the coal may be greater than now anticipated. There is also a larger percentage of coal that will make coke than in the Bering River field. A far smaller percentage of the field has been entered by private claimants, and most of these claims appear to be clearly illegal on account of dummy entries and other violations of the law, for which indictments are now pending.

TRANSPORTATION FACILITIES FOR THE MATANUSKA COAL FIELD.

A railroad to develop this field and to open up the great interior valleys has been started from Seward, which has by far the best

harbor and the best town site in Alaska which I saw or of which I have been able to obtain any knowledge. The town of Seward lies at the head of Resurrection Bay, which is a magnificent and extensive harbor, landlocked and free from ice, and already selected by the Government as a naval coaling station, and where smelter operations may be one of the future industries.

The only criticism of the harbor of which I have heard is that the water is so deep that docks and fixed moorings will be necessary for perfect safety, but as this is also true of the harbor of Seattle, which has been regarded as one of the most magnificent in the world, it seems to be a fault that closely approaches a virtue. The railroad from Seward—the so-called Alaska Central or Alaska Northern—at present extends only 71 miles to a point on Turnagain Arm, where it stopped for lack of funds and for various other reasons, among which the withdrawal of the coal fields from entry is particularly emphasized. I think, however, that its financial plans afford a more convincing reason for its failure. At all events, it has passed through the courts into the custody of its bondholders, who are not particularly eager, if they are able, to finance its further extension. While a part of its construction does not seem wisely adapted to the transportation of coal or other heavy freight, I believe this road should be continued on to the coal fields and beyond them to the interior, and that if private interests do not care to undertake the task the Government itself should do so. The situation here is not like that in the Copper River country. No large financial interests are back of the railroad; no large investments have been made which it will be necessary for private interests to protect.

Such a railroad as I have suggested will pass through a country which appears to have large agricultural possibilities as well as great mineral resources. These possibilities and resources, however, will require time for their development. The adoption of a leasing policy will take away from the promoters of such a road the lure of great gain from the exploitation of the coal fields. This exploitation clearly should be prevented in the public interest. But at the same time the Government must recognize that if it withdraws from private capital this incentive for railroad construction the Government itself must assume the obligation of making possible that kind of development upon which it insists for the general good. It has been urged that the Government should meet this objection by guaranteeing the payment of bonds or the interest on bonds equal to the cost of the construction of the road. I can see no advantage whatever in this policy. If the Government is to guarantee the cost of construction, I see no reason why the Government should not own the road outright, whether it operates it or leases to an operating company.

If a plan for construction at the joint risk and joint profit of the private investor and of the public along the lines of the Chicago traction ordinances could be put into successful operation, this might reconcile the conflicting views of public policy as to the Government ownership of railroads, especially if the Government's share of any future profits should be commuted into an equivalent reduction of the rates or should be directly expended in furnishing to Alaska the other means of transportation of which it is and will continue to be so much in need. After such consideration, however, as I have been able to give to the matter, I believe that the uncertainty of immediate financial return will prevent the adoption of this plan and that the imperative need of immediate transportation development calls for the construction of at least one main trunk line from tidewater to the Yukon (approximately 500 miles), which can better be constructed from Resurrection Bay through the Matanuska coal fields than in any other way. There seems to be no likelihood that the Copper River Railroad will be extended into the interior for years to come, and even then its route would probably be far removed from the line I have suggested.

The Matanuska coal should be brought to Seward for the use of our naval coaling station, and a mine for that purpose can well be opened by the Government on the Matanuska, where it can be made to serve as an example for private mining, where it can furnish information and serve as a check upon excessive profits by the lessees under Government leases. The Secretary of the Navy authorizes me to state that he believes there should be reserved a sufficient portion of high-grade Alaskan coal, suitable for the use of the Navy, to be mined hereafter for this express purpose under some appropriate Government agency. There is great need of suitable coal on the Pacific coast for the Navy. The Navy Department is now conducting a test of the available coals in the Pacific Coast States with the result that none of these coals have been found suitable for naval uses. It is the intention to test additional coals from New Mexico and Wyoming.

I have made some inquiries to ascertain whether the present owners of the Alaska Northern are willing to give any assurances that they will extend that railroad through the coal fields to the interior in the near future, with the result that some at least of those interested in it have indicated a preference to sell the railroad to the Government for the face of the outstanding bonds, which amount to some \$4,600,000. I assume that it can be purchased for the real value of the road, whatever that may be, and that it will not be extended by its present owners.

In undertaking railroad construction there is ample precedent at Panama, and it must always be borne in mind that as a matter of

principle the Government is not thus invading the legitimate domain of private enterprise, but is in effect simply resuming one of its own proper functions. The Supreme Court of the United States said in *United States v. Joint Tariff Association* (171 U. S., 505-570): "The business of a railroad carrier is of a public nature, and in performing it the carrier is also performing, to a certain extent, a function of government." In *Talcott v. Pine Grove* (23 Federal Cases, 652) the United States Circuit Court for the Western Division of Michigan said that railway corporations "exercise delegated sovereign rights" and are "but a portion of the public government. * * * And it is not true, we submit, that it is in degree only that these franchises differ in their relations to the public from mills and inns, as is said in *People v. Salem*. The one is private property; the other is a political function, which, when resting in the hands of government where originally it resided, or delegated still for the same public use, to either persons or corporations, ever has been, and of right may be, aided by taxation. * * * It is for the performance and regulation of this old and familiar governmental duty, in a mode deemed by the legislature most efficient and economical, that in modern times railway and other corporations have been created. And in the most plenary and critical sense, under the general railroad law of Michigan, they are parts of the political organism. The road, once constructed, is, instantaneously and by mere force of the grant and law, embodied in the governmental agencies of the State and dedicated to public use. All and singular its cars, engines, rights of ways, and property of every description, real, personal, and mixed, are but a trust fund for the political power, like the functions of a public office."

Indeed, the most important features of our railroad law are squarely based and depend upon this theory of the relation of railroads to the functions of government. What has happened, then, with respect to railroads is simply that the Government has delegated one of its own functions to private agencies for what, at the time, are believed to be considerations of wise expediency. If, for reasons of equal expediency, the Government decides at any given time or place to resume its true function, it can not be said to be in any sense invading the field of private enterprise.

If we may assume that some of the coal claims that have been entered in Alaska in either the Matanuska or the Bering fields have complied with the law and should be allowed, the suggestions I have made will enable us to compare in practical operation the development of coal under private ownership, under Government leasehold, and under the direct operation of the Government itself. We shall have an important railroad under private ownership, with governmental regulation, to compare with one under public ownership, and these two railroads will operate in separate fields where they

will not directly conflict, but where each may serve as a check upon the other, and the advocates of each method will doubtless come to appreciate more fully and more fairly both the difficulties and the advantages of the railroad as a governmental agent.

METHODS OF OPENING THE ALASKAN COAL FIELDS.

It remains only to consider more in detail the methods by which the coal fields should be opened. Those suggested have been the sale of the lands in fee, their development under lease from the Government, and their operation by the Government itself. I believe that the time has passed when the Government should convey an unrestricted title to its coal fields. The day is done in which the Government should deliberately encourage the unrestricted private exploitation of the sources of power. To impose effective regulations upon these sources after they have passed to private individuals in fee is exceedingly difficult, even if not impossible. The ownership of the fee carries with it under the law the right of unrestricted sale, and many regulations which are desirable in the public interest can be imposed, if at all, only after radical changes in the laws and prolonged litigation in the courts, perhaps only after constitutional amendments. It is therefore unwise, and in my opinion unnecessary, to sell our coal lands in order to secure their effective development.

On the other hand, direct Government operation, including the mining and the selling of coal, involves such deep and far-reaching changes, both of policy and of administration, that there is no likelihood at the present time of its adoption to the exclusion of private operation. Unlike the Government ownership of railroads, public coal mining has never been held by the courts to be a function of government. It would be regarded by many sincere and disinterested citizens as an invasion of the field of private enterprise, and would involve such general and uncompromising opposition that even those who believe in its adoption as a matter of principle should not insist upon tying up the coal fields of Alaska until the great economic and political questions that are involved in its exclusive application to these fields have been fought out to a practical conclusion. The true function of government is not merely the preservation of public order or the regulation of the conduct of individuals, but the carrying on of any enterprise which will promote the welfare of the community as a whole more effectively if carried on by the organized community than if left to the voluntary action of individual members of the community. But to determine whether a particular activity answers this test depends in every instance on a final and complete analysis involving a consideration not only of immediate results, but of the far-reaching consequences upon humanity and upon the social order. While, therefore, much can be said in favor

of permitting the Government to enter experimentally into those fields upon which industrial development and the welfare of society depend, which perhaps may in the future include the development and distribution of power and the means by which power may be created, I do not believe that the Government alone should preempt these fields or exclusively assume their development until it becomes far clearer than it is to-day that their development by private enterprise can not be effectively controlled. For this reason I am opposed to the policy of having the Government alone own and mine Alaskan coal.

SOME ADVANTAGES OF AND OBJECTIONS TO THE LEASING OF COAL LANDS.

I believe that the leasing system avoids the controversies and the difficulties of both extremes of public and of private ownership. It has been adopted with conspicuous success in the great mining communities of Australia and New Zealand. It is now the established law of the Yukon territory lying in Canada just across the border line from Alaska. It is the system under which much of the privately owned coal land of the United States is in fact to-day being developed. Under it we can insert as matters of contract and as conditions to which the lessee voluntarily consents those regulations and requirements which promote the public interest, the enforcement of some of which by mandatory law might be unconstitutional. By making the terms of our leases liberal we can make them even more attractive to capital than if we adopt the policy of an outright sale of the fee.

Let us consider for a moment what ordinarily happens with coal land that is sold outright. Comparatively little of it is mined by the original purchaser. He usually disposes of his title to a succession of others, each of whom in turn adds to the cost of his purchase the profit in consideration of which he sells, and with increasing frequency the final result is the operation of the coal mines by a lessee, who must pay a return on these accumulated profits and who adds his own, transferring the burden of it all to the consumer. One hundred and fifty-six million tons of coal, or 34 per cent of the total production of the United States for the year 1909, were mined from lands operated under private leases, and these leases are common in every coal-mining State, naturally much more so in some States than in others. Considering the areas involved, we find that in West Virginia, in the great Pocahontas and New River coal fields, which yield the finest steaming coals of the continent, about 90 per cent of the area in the Pocahontas district and about 60 per cent of that in the New River district are mined on a private-lease basis, which pays the lessor a royalty fee averaging 10 cents per ton.

In the Southern Appalachian coal fields, just south of the Pocahontas region, it is estimated that 75 per cent of the area is mined on a lease basis; in the Hocking Valley region of Ohio, 75 per cent; in Iowa, more than 70 per cent; in Arkansas, 60 per cent; and in Oklahoma nearly all of the coal land is operated on a lease basis.

Taking all of our principal coal-mining States, the census figures for 1909 show that out of a total of 6,900,000 acres of coal lands under operation, more than 2,000,000 acres, or 30 per cent of the whole, was in 1909 operated under a system of private leases. It is therefore substantially correct to say that, whether we like it or not, the choice is not as to whether we shall mine our coal on the leasehold system, but whether we shall mine it under leases from private owners or from the Government direct. That the consumer has everything to gain under the governmental leasehold must be apparent, for the Government can make its royalties as little as it chooses and it has no invested capital and no unearned increment on which to pay returns. Opposition is to be expected only from those who wish to obtain our coal lands for stock jobbing or speculative purposes or so that they may make a greater profit than is essential to assure immediate development. Indeed, immediate development can be assured only under the leasehold system. Without it there is no reason why private individuals should not acquire the property and hold it out of development until they can take advantage of the increasing demands of the future. Expedients could be adopted in the effort to enforce development by requiring the purchaser to mine a certain amount of coal or to expend a certain amount of money in developing the land under pain of forfeiting his title to the Government, but these, after all, are only crude and awkward devices for securing what can be far more effectively secured by means of lease. Indeed, these devices are economically unsound, for they compel development whether the immediate market justifies it or not. The leasing system, upon the other hand, can be given much of the flexibility necessary for meeting automatically the fluctuating demands of the market.

The opponents of the leasing system delight to dwell upon the fact that in the first half of the last century the Federal Government undertook to lease the lead mines on the public domain and that the effort was not a success and was abandoned in 1847, but when we consider the conditions under which the attempt was made, and especially that the leases were limited to five years, with a royalty of one-sixth of the lead for Government use; that the validity of the leases was constantly attacked upon the ground that the statute did not contain the necessary provisions for carrying it into effect; and that the system was permeated with the same kind of fraud and evasion that until recently characterized the operation of certain of our later

land and mineral laws, we can understand the failure and that the experiment is of no value whatever in determining the merits or demerits of a properly drawn and properly enforced law for the leasing of the public coal lands of today. The whole experiment was carried on under such crude and inefficient methods that the total rental received by the Government for the four years ending with 1844 was only \$6,354.74, whereas the expenses for the same period amounted to \$26,111.11.

A few persons who have expressed themselves as being "unalterably opposed" to a leasing system for the coal lands of Alaska have stated that they were unalterably opposed to it because, in the first place, it would be impossible to get any leasing legislation through Congress; and in the second place, if a leasing bill did pass Congress, it would be impossible to get anybody to work coal lands on a lease basis. I need not discuss at this time what Congress may or may not do, except to say that, in my judgment, Congress is far more likely to pass a rational leasing measure than it is to throw the coal fields of Alaska open for unrestricted private exploitation.

As to the second of these objections, whether or not the leasing of the coal lands in Alaska is practicable, let us see what the experience has been with reference to such a proposition in our own and other countries. A similar objection was raised when it was proposed to lease the coal lands in New Zealand and in the Australian States, such as New South Wales, Western Australia, Queensland, Victoria, and Tasmania. In each of these far-away countries the local conditions in some respects resembled those in Alaska. The fields were remote from commercial centers, with meager or no transportation facilities, and industrial development was carried on under great difficulties. It was argued in each of these countries that the great need was capital and development, and that the coal fields should be thrown wide open to all who were willing to risk their capital in helping to open up and build up the country. In some cases the sale of the fee was tried; but the wise Anglo-Saxons of that region thought it better as a matter of national policy to keep the ultimate control of these essential resources in the hands of the State, and they adopted a leasing system as the best means of doing this. And what was the result? The coal lands in each of these countries have been taken up and are being developed and mined under the leasing system; and under that system coal is not only being mined for home consumption, but it is being exported to our own Pacific coast, and to other countries bordering on the Pacific. The difficulties that stood in the way of leasing the coal lands in those countries were imaginary difficulties, and they disappeared when the matter was put to a practical test.

Again, in Nova Scotia, where the conditions for investment are even more unfavorable than they are in many parts of Alaska, those who were opposed to the adoption of a leasing system said that it would be impossible to lease public coal lands on any basis; but when the experiment was tried, parties came forward to take out the leases and are operating the coal lands.

In our own country, in the States of Wyoming and Colorado, when it was proposed that these States should lease their coal lands instead of selling them outright, it was argued that nobody would take out the leases. But experience has shown otherwise. In Colorado in 1900, in addition to the large acreage of coal lands held in private ownership, nearly 6,000 acres of State coal lands were operated under lease, and in 1910 nearly 20,000 acres of the State coal lands were being operated under such leases, with a royalty charge of 10 cents per ton. In Wyoming to-day more than 3,000,000 acres of State lands of all kinds are being operated under 5,700 leases. While only a small portion of this acreage relates to coal, the State statistics do not indicate what this proportion is.

The statutes of Colorado, Montana, and Idaho provide for leasing State lands containing stone, coal, coal oil, gas, or other mineral. Colorado and Montana require a minimum royalty of 10 cents a ton for coal mined on such land. Montana prohibits the sale of its coal lands but authorizes the lease of the surface for agricultural or grazing purposes. It also requires the locator of a mining claim for gold, silver, and other metals, at the expiration of one year from the date of the location, either to purchase the claim at \$10 per acre or take a lease thereof at such price and upon such terms as may be agreed upon between him and the State Board of Land Commissioners. Idaho also authorizes leases of State land containing precious metals. Minnesota authorizes leases of State land containing iron ore. North Dakota provides for the leasing of coal lands at a royalty of 10 cents per ton. Oregon and Washington provide for leasing State lands containing gold, silver, lead, cinnibar, or other valuable minerals. Wyoming authorizes the State Land Board to lease on a royalty basis State or school lands supposed to contain coal, oil, or minerals, the royalty not to exceed 10 per cent of the gross output of mineral or oil, and not to exceed 10 cents per ton for coal. Some of the States above noted limit the leases to 5 years with provision for renewal, some to 50 years, and some to a period to be fixed in the discretion of the State land officials.

CONDITIONS TO BE INCORPORATED IN COAL LEASES.

With records at hand giving the results of a large volume and great variety of experience covering the operations of both private and public coal-land leases in our own and many other countries, it

should not be difficult to decide upon the ordinary conditions and requirements that should be incorporated in a leasing system for the Alaskan coal fields—working conditions that will meet the legitimate demands of the prospector, the investor, and the operator, safeguard the health and life of the mine worker and the property of the Government, to the end that the public may secure an adequate supply of fuel at the lowest cost consistent with these conditions.

Some of the bills that have been recently introduced in Congress provide that the Interstate Commerce Commission shall regulate the prices at which the coal mined under these leases is sold, not only by the miner but by the middleman and the retailer to the consumer. Important as is the question of protecting the consumer, it seems unwise that price regulation by the Government should be insisted upon as a necessary feature of a coal-leasing law for Alaska. Obviously such regulation must extend to the retailer if it is to do anything but enable the middlemen to make the profit denied to the miner. Regulation of this sort would be a new departure in either State or Federal administration. It raises fundamental questions of public policy about which differences exist that are as yet uncompromising. It would doubtless prevent any early action by Congress. Certainly if enacted in the form presented in these bills, which merely declare the general principle and leave all of the real difficulties to be worked out by the commission and the courts, it would prove a serious, if not prohibitive, barrier to the development of a new country and a new and uncertain market. Under these conditions it would seem a sufficient undertaking to inaugurate a new system of tenure without imposing upon Alaska the additional difficulties of the administration of a hitherto untried attempt to settle by public regulation what would constitute a reasonable profit for the miner, the wholesaler, and the retailer of coal. It is especially hard to understand how those who doubt the success of railroad regulation in Alaska can now advocate entering the more difficult field of the regulation of commodities. Price regulation has been suggested by some representatives of large corporate interests as a safeguard under which the modern economic tendency toward consolidation might be safely permitted to continue, but the bills referred to do not propose to treat Alaskan coal on the principle of a regulated private monopoly. This question should be left for more mature consideration as a question of broad general policy applicable, if at all, to the States as well as to Alaska.

It may be practicable to provide in connection with the renewal of leases at their termination that such renewals shall be subject to the then existing laws applicable thereto. This principle has been successfully adopted in the Australian leases. Our first leases can well be made more favorable than those which follow, so that prompt

development may be secured; and if they are for reasonable but fixed periods, and if we lease only as much of our coal lands as may be required for the existing market and its effective extension, we can thus proceed experimentally, correcting early mistakes and meeting future conditions as they arise.

The prime requisites of a leasing system are that only sufficient coal lands should be leased to meet the existing market and encourage its development; that the terms of the lease should be such as to attract capital and protect both the capital invested and the public interest; that the quantity leased to any one lessee should be limited to the amount that can be profitably mined as a unit and yet be large enough to attract investors; that the lessee shall pay his royalty as he mines his coal; that this shall annually amount to at least a fixed minimum which will make it unprofitable for him to hold the land without production; that he shall mine his coal without unnecessary waste and with due regard to the health and safety of his employees; that he shall not engage directly or indirectly in any combinations, agreements, or understandings to control the price of coal; and that the revenues derived by the Government shall not be used as a source of Federal revenue or as a substitute for taxation, but shall be devoted to the development of the State or Territory in which the coal is mined. These at least are the principal features which should be embodied in a leasing law. It is to be noted, however, that the Alaska coal fields will not require the large permanent plants that economic development justifies in certain Pennsylvania and West Virginia fields. Indeed, the physical condition of the Alaska fields makes the limitation of the area and of the investment under a single lease a natural if not a necessary feature of their development.

EXPERIENCE WITH COAL LEASES IN AUSTRALIA AND NEW ZEALAND.

From the information that I have at hand I infer that in Australia and New Zealand the quantity embraced within a single lease does not seem to be limited, but reliance is placed upon the requirements which make it unprofitable for a tenant to lease more land than he really develops. That both the Government and the coal operators are believers in the leasing system is apparent from its universal application and from the investigation made in 1907 and 1908 at the instance of President Roosevelt by Arthur C. Veatch, of the Geological Survey. With regard to the conditions in Western Australia, he says:

At Kalgoorlie I found the mining men unanimous and emphatic in the indorsement of the statement that the leasing system is a better method of promoting mining development than freehold. The views of Mr. Richard Hamilton, president of the chamber of mines and manager of the Great Boulder Proprietary Co. mine, one of

the richest gold mines of the world, carry great weight, as they represent the views of a man who is not only a mining engineer, but a lawyer, a man with wide experience, and one who speaks only after careful consideration, and then with mature judgment. Man after man in the field said: "See Hamilton; he knows what we think; he knows the conditions; and what he tells you may be taken as the opinion of the mining men of this country." Mr. Hamilton has spent considerable time in America in studying our mining conditions, and is emphatic in the belief that mining development is promoted more by the Western Australian leasehold system than by the American freehold.

In view of these facts one may confidently assert that the mining law of Western Australia is, with minor exceptions, regarded as quite satisfactory by the mining interests of the country, and that in the opinion of the mining men development is promoted more by a leasehold than a freehold tenure. * * *

Among the factors that make these leases important for comparison with the statutes of other countries are:

1. In Western Australia the population is largely made up of those interested in mining.

2. Western Australia is a country of great mineral wealth, having produced in each of the last eight years between 1,500,000 and 2,000,000 ounces of fine gold, or several times that produced by Alaska, and has for the same period had a greater total annual mineral production than any of the other Australian States or New Zealand, except New South Wales, which surpassed it in 1906 and 1907.

3. It contains enormous areas yet undeveloped, the State having an area of almost a million square miles, or more than the combined areas of California, Oregon, Washington, Nevada, Idaho, Utah, Colorado, Wyoming, and Montana, and a total population of less than one-twentieth of that of all these States, or less than that of the single State of Utah.

4. It is a country in which mineral lands were sold outright, and its mineral laws have therefore been evolved from a basis similar to that which now is, and for many years past has been, commonly accepted as the rule and practice in the United States.

5. The desire of the Government to promote and encourage the development of its mineral wealth in every way is emphatically shown by the policy of Government aid. This policy in the past has involved enormous expenditure in connection with water supplies for the mining districts, the Coolgardie water system alone (built to pump 5,000,000 gallons a day 351 miles to an elevation 1,200 feet above the supply point) involving an expenditure on the part of the Government of over \$18,000,000. * * *

The mining act of 1904 must therefore be regarded not as a theoretical attempt of political economists but as the matured law of a State which has had large practical experience in mining matters, in which, in fact, mining is the principal industry and in which vast areas await settlement and development; a State which has, moreover, in many ways conclusively demonstrated its desire to permit and encourage the development and settlement of its territory.

And with regard to New Zealand he reports that—

The net result of the administration of the minerals contained in the public domain of the United States and New Zealand for the past 60 years is that, while both have provided for the sale of mineral lands and neither has reserved minerals in patents or grants, in the United States all the mineral production is either derived from freehold land or land that is in process of becoming freehold, while in New Zealand 90 per cent of the whole mineral production comes from areas held under lease from the Government. Truly, this result but corroborates the statement called forth by the investigation in Tasmania that the patriotic and efficient administration of the land affairs of a country is not a human impossibility.

The country in which these results have been attained is one of no mean mineral wealth, and is one in which the mining industry is in a very healthy and progressive condition. It contains, in the Waihi gold mine, the most productive gold mine in Australasia and the third or fourth in the world. It has the third most productive colliery company in Australasia, and is second only to New South Wales in its total coal production. It has been the center of several gold rushes, which, following those in California and Victoria, to some degree depopulated the Victorian fields and attracted many from California. It has produced in a little over 50 years more than \$350,000,000 worth of gold, and, with but little over one-sixth the area of Alaska, produced in 1905 three-fourths as much gold, five times as much silver, and many times as much coal. It has one-third more area and about three times the population of Utah, and in 1905 produced one-quarter more coal, about twice the amount of gold, and one-eleventh the quantity of silver.

The comparison with the coal production of Alaska is, of course, of no consequence, as the coal lands in Alaska were not really open to development in 1905. This, however, does not detract from the value to us of the experience of New Zealand. In the Yukon territory of Canada coal lands are now leased by the Government for a term of 21 years at an annual rental of \$1 an acre, and not more than 2,560 acres can be leased by one applicant. The royalty is 5 cents per ton on the merchantable output of the mine. Here, as in Alaska, facilities for transportation are necessary before any extensive development can be expected.

OPINIONS REGARDING THE LEASING OF COAL LANDS IN ALASKA.

Shortly before I went to Alaska I improved an opportunity to discuss the question of its coal development with a group of prominent coal operators in the State of Pennsylvania and I was surprised to find that they were unanimously of the opinion that the leasing system should be adopted and that only sufficient land should be leased to meet the demands of the market and provide the incentive for developing that market in a vigorous and rational manner.

When I reached Cordova I was presented with a series of resolutions adopted by the Cordova Chamber of Commerce expressing its disapproval of a leasing system for Alaskan coal lands. Since my return to the States I have received from the chamber of commerce a most courteous statement to the effect that after further careful consideration the chamber did not now desire to be considered as opposed to a leasing system, assuring me of their confidence and support, and suggesting certain requirements or conditions which it believed should be incorporated in leases if such a system is adopted.^a What is desired in Alaska is prompt action by Congress in some direction that will promote development.

^a Since this address was given I have received the following telegram:

SEWARD, ALASKA, November 2, 1911.

Mass-meeting Seward people most heartily indorse your policy advocated before mining congress. Godspeed.

SEWARD COMMERCIAL CLUB.

I have been equally interested in receiving a resolution adopted by the executive committee of an important organization in the oil industry of the State of California stating the conviction that a leasing system was the only way likely to be found out of the existing situation and urging its members to devote their attention to a consideration of the proper terms to be embodied in a leasing law. I have also received from the Philadelphia section of the Mining and Metallurgical Society of America, which embraces in its membership some of the most experienced and distinguished coal-mining engineers in the country, a set of resolutions adopted at its meeting on the 17th of this month, after preliminary submission by mail to its members and an extended discussion at the meeting. These resolutions are interesting and instructive, if only as suggestions. They read as follows:

Your committee find the following conditions existing in the Territory of Alaska relative to its coal resources:

First. It is essential for the proper development of Alaska that its coal fields be opened for commercial use without further delay.

Second. There are now known to exist in Alaska but two relatively small fields containing high-grade Navy fuel, and inasmuch as the Government now possesses no original source of such supply on the Pacific coast, it is desirable in the interests of national defense that a selected area of these fields be held and operated under the direct control of the Government.

Third. It is in the interests of conservation, economic operation, and due regard to the public welfare as well as to the operator, that coal lands in Alaska be leased and that these leases be made for all the coal in the ground.

Fourth. The royalties should be low and based on percentage of selling price of the coal at the mines.

Fifth. The minimum annual royalty should be nominal for the first two or three years after the execution of the lease, in order to permit and encourage the installation of efficient and durable equipment. After that period the minimum per acre should increase more rapidly than the area increases.

For example, the minimum royalty for 5,000 acres should be several times more per acre than for 1,000 acres. Such a plan would tend to prevent the tying up of large areas of undeveloped coal territory.

Sixth. A due diligence and forfeiture clause to effect continuous work should be included in the lease.

Seventh. Leasehold in coal land shall include all necessary mining rights and agricultural rights to the surface.

Eighth. Leases should not be given for less than 160 acres, and in shape should be square, their boundaries being east and west and north and south. In surveyed territory the boundary lines must conform to governmental subdivisions and consist of four contiguous 40-acre plats.

Ninth. It should be clearly recognized as a basic principle that the value of coal lands in Alaska to the Nation lies more in their use for industrial, commercial, and naval purposes than in the royalties to be derived therefrom.

Tenth. It is desirable that the revenue obtained from coal royalties revert to the benefit of the Territory.

Eleventh. The quality of Alaska coal varies from poor lignite to high-grade semibituminous and anthracite. The physical character of the seams also varies, the best coals being seriously and unfavorably affected by the geologic structure. The

high-grade coals of Alaska, which are now available for development under the present state of the art of mining and utilizing coal are limited in quantity, notwithstanding the exaggerated reports to the contrary which have appeared in the public press.

Resolved, That your committee is of the opinion that the present coal-mining conditions in Alaska are unsatisfactory and detrimental to public welfare and that laws should be enacted, based upon the above principles; be it further

Resolved, That the committee recommends that this resolution be adopted as an expression of the views of the Philadelphia section of the Mining and Metallurgical Society.

I have already stated that Director Holmes, of the Bureau of Mines, and his associates have personally visited both the Bering and the Matanuska coal fields, and I am glad to be able to say that Dr. Holmes has read this address and concurs in its statements of fact and in its recommendations. That they are infallible I do not claim. They may include inaccuracies of statement and more serious mistakes; but these I reserve the right to correct whenever I discover them or whenever new facts or more mature consideration may lead me to a different conclusion. For the present they are offered as definite suggestions for a policy under which the Territory of Alaska may be immediately opened for wise and vigorous development.

I have been greatly pleased with the fair-mindedness and public spirit of the Alaskan people on this subject. I believe back of their naturally great and justifiable desire for immediate action they want done in this matter whatever will in the end prove best for Alaska and for the Nation as a whole, without regard to special individual or corporate interests; and I believe that Congress and the American people as a whole will be in accord with that purpose.

