

## The Maritime Features of the "Crude Petroleum" Problem

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*Introductory.*—There are many interesting and important events connected with the petroleum problem. The remarkable men who conceived the thought of transporting petroleum by pipe line, conserving the by-products of the commodity, and conducting extended investigation and research whereby the flash point of the oil was raised, its cost reduced and its supply assured, are deserving of the gratitude of this nation.

It was primarily the success attained by Captain Lucas, after his comprehensive search for oil in Texas and Louisiana, that was the impelling cause which prompted the Navy Department to conduct the extensive series of liquid fuel-oil tests that were made from 1901 to 1903. The sensational discovery of oil at Spindle top made a deep impression upon Rear Admiral George W. Melville, then Engineer-in-Chief of the Navy, and the discovery of the vast oil field in Texas convinced him that, within a generation, if not within a decade, crude petroleum was going to play a very important part in warfare, and that the commodity might possibly develop into a necessary munition of war.

*The United States' Commanding Position as a Petroleum Producer.*—In the study of the various problems relating to the world's production of crude petroleum, the position of the United States is one of commanding importance, whether viewed from the industrial or the military aspect.

The present yield of this country is practically double that of the rest of the world, and, in view of the productive and prospective fields possessed by various countries, together with the comprehensive and exhaustive search that has been made throughout the world for petroleum, it is extremely probable that this lead will be maintained for the next decade.

As regards the character of the crude-oil yield of different countries, America possesses the greater part of the supply that contains a paraffine base, and therefore a considerable portion at least of the American product produces the best illuminant. Of all the crude-oil distillates, kerosene is in many respects the most important, and the Appalachian product for this purpose is favored, particularly in the Far East, above that of any other petroleum yield of the world.

We are undoubtedly in advance of any other nation in the extent and character of our prospecting and drilling facilities, and this is attested by the fact that American experts are found in nearly all the other oil districts of the world, directing the activities of production.

In methods of refining our position is on a parity with others, if not a commanding one. We have been able to obtain from the crude product various distillates of as high character, and at as low a cost, as can be produced by the foreign refineries. New and important uses are being found for the by-products of crude oil, and our discoveries in this direction may undoubtedly be regarded as important as, if not superior to, those of our rivals.

In methods of land transportation our lead is undisputed. This should not be surprising, considering the extended and diversified experience that we have had in the construction of pipe lines, pumping stations, and containing tanks, as compared with the relatively limited experience of the rest of the world.

*The United States' Weakness as Regards Ocean Transportation.*—There is one important feature of the fuel-oil problem, however, wherein we are lamentably weak, and that is the maritime distribution of the product from the terminals of the pipe lines to various important seaports of our own country, as well as to ports abroad.

The modern sea-going tankers that we possess are few in number as compared with those that fly the ensign of Great Britain. Our failure to convey or distribute crude oil in as efficient a manner as we produce, refine, and transport the product, constitutes a serious industrial reproach to our commercial abilities. When viewed from a military standpoint, our lamentable dearth of ocean tankers and sea-going barges constitutes a great military weakness.

*Our Lack of Sea-Going Oil Craft Entails Heavy Direct and Indirect Loss to American Industrial Activities.*—It appears incongruous that a British corporation should find it a profitable venture to spend millions of dollars in prospecting for oil in Mexico, Ecuador, Colombia, and other Central and South American republics, when our own capitalists ought logically to undertake the practically exclusive development of those fields.

The British corporations engaged in petroleum development cannot possibly have the intimate professional knowledge and extended practical experience that is possessed by our own experts. Our banking interests are likewise undoubtedly as ready to advance capital in the exploitation of legitimate fuel-oil enterprises as the financial interests of England. It appears evident that it is only because the American maritime feature of the fuel-oil problem is so unsatisfactory that it has been possible for the Pearson Corporation in Mexico to compete against the American interests in that country.

As illustrative of the deplorable condition of affairs as regards the maritime feature of the crude-petroleum problem, it is pertinent to call attention to the fact that, when the Liquid Fuel Board of the Navy was conducting its extended series of fuel-oil tests from 1901 to 1903, an investigation that extended over a period of 30 months, and an investigation wherein there were expended at least a quarter of a million dollars, there were several periods when the President of the Board was informed that, for two or three days at least, there was not one single American tanker carrying fuel oil between the Texas terminal ports and the leading seaports on the north Atlantic coast. Careful investigation was made to determine if such a condition of affairs actually existed, and, from the best information obtainable, there was one period, if not two, when it happened that every American sea-going tanker was either temporarily disabled, detained in port, or had met with some delay so that no oil vessel was steaming between the Gulf and north Atlantic ports.

It is possible that, at these two particular periods, one or two such tankers may have been proceeding with empty compartments to the Gulf for a cargo of oil. It may be stated as a fact, however, that in 1901 or 1902 a situation arose whereby, for at least a few days, not one gallon of crude oil was being transported by water from Texas to northern ports. There were, of course, during this special period, considerable quantities of oil being transported in barges from the terminal pipe lines and refineries at Baltimore, Point Breeze, Marcus Hook, and Bayonne to other points on the Atlantic.

As bearing upon the question of the world's dearth of oil tankers, it may be well to call attention to the fact that, about 18 months ago, the Paymaster-General of the Navy made an effort to find out the number and character of the tankers that could be chartered at short notice by the government. It was found at that time that it would not be possible to secure at short notice one single American tanker on the Atlantic coast; every tanker flying the American flag being required to convey the oil that was used for industrial and other purposes by regular consumers.

A still greater surprise was experienced when it was found that but one British tanker could be procured at that period, and that this vessel could only be chartered by the Navy Department by the payment of a rental of \$575 per day, which rental did not include fuel and port charges. This rental had to be paid from the date the British tanker was chartered in London, and was to continue until the return of the vessel to the same port.

It seems surprising, if not astounding, in view of the fact that we not only surpass the world as regards the yield of the crude-oil product, but that likewise we possess advanced methods of boring, improved

processes of distilling, and incomparable methods of land transportation, that the maritime feature of the oil industry should have been neglected by this nation.

*Profits of the Oil Industry have been in the Refining and Transportation of the Product.*—In the study of the extensive and far-reaching report of the Commissioner of Corporations, as contained in the government brief against the Standard Oil Co., it is observed that the principal profits of that corporation have been in the refining and the transportation of the oil, and not in prospecting and drilling for the product. The distribution agencies, however, have been inadequate, except so far as they concerned districts fairly contiguous to pipe lines, refineries, and deep-water terminal points. At such particular points, which must necessarily be limited in number as compared with the rest of the country, the distributing facilities have been efficient, considering the expense, difficulty, and hindrances encountered in distributing all inflammable hydrocarbon products. There is no doubt, however, that every interest concerned either in prospecting, boring, refining, or distributing crude oil has been very materially injured by our failure to control the distribution by sea.

*The Importance of Petroleum as a Factor in Extending Our Foreign Market.*—Fuel oil has played a very important part in extending our trade with China. The writer, in the course of his duties as a naval officer, spent about 6 years in Asiatic waters, and interviewed various American and British Consuls, as well as the leading merchants of the China coast, in reference to the far-reaching influence of the petroleum industry. The study of our trade development with China must cause one to be impressed with the fact that the three distinguishing agencies which have done most to cause the Land of Sinim to abandon many of its traditions and much of its medievalism have been the missionaries, modern surgery, and the work of the Standard Oil Co. In distributing throughout that country an illuminant that has been a direct boon to the people, the Standard Oil Co. has exerted an indirect influence that has been of far-reaching consequence in extending our trade relations with that Empire.

Light is a great civilizer, and the remarkably convenient, economical, and safe manner in which the Standard Oil product was distributed, even to the wilds of Hunan, was the forerunner of the entry in large quantities of other American products.

In the distribution of refined petroleum in cases rather than in bulk, our country attained for some time considerable success in the employment of sailing vessels. We lost, however, a great opportunity in not effecting legislation that would have retained to us this trade by regulating the export of the product, and that would have given to this nation a paramount control of the distribution of petroleum.

The writer was on the China coast about the period when the Russian oil interests, supported by the Rothschilds and other great banking interests of Europe, attempted to wrest the control of the petroleum industry from America. Modern steel oil tankers were built for the Rothschilds for this purpose, and large containing tanks were erected on shore at various points on the China coast. It was found, however, that the American product was so superior in quality as an illuminant, and it was so well contained and boxed, that it was practically impossible to supersede its use by the substitution of the Russian product.

It was not by a haphazard guess or by accident that the existing 5-gal. rectangular petroleum case was constructed. The form of the containing case, the material from which it is manufactured, the character of the soldering and the method of boxing and shipping constituted a development that represented heavy expenditure, extended experimentation, and practical knowledge upon the part of the Standard Oil experts.

In distributing this product, therefore, even unto the uttermost portions of the Chinese Empire, the Standard Oil Co. rendered a service of incalculable benefit, both to China and to America. If it had not been for the energy, efficiency, and tact displayed in developing our petroleum export trade, many looms in New England and many furnaces in the Appalachians that are now finding it a profitable venture to export their output to the Celestial Empire would be idle to-day.

It is believed that the American export trade of the future to Central and South America, Australia, and particularly to China, is greatly dependent upon the distribution or maritime feature of the fuel-oil problem. This phase of the oil problem is therefore a matter that is specially worthy of the consideration of the American Institute of Mining Engineers, for it is the mining engineer who is most intimately interested in the primary feature of the oil industry—and that is the prospecting phase.

There is something lamentable in the thought that, despite the fact that this country has a commanding lead in all but one of the various phases of the petroleum problem, America should fall down at the last stage, and that we should see our British cousins, through their superiority as regards the maritime feature, wresting from us a maritime activity of great value—an activity that logically should be possessed by America.

*The Military Importance of the Maritime Phase.*—It is not opportune at this time to speak of the military features of the distribution problem, since there are phases of the matter that intimately concern national defense. The fact is well known, however, to British naval experts, and mention has been made of the subject in the English press, that our navy is lamentably lacking in the oil tankers that will be required to supply American battleships and other naval vessels that have been designed

to burn oil exclusively. The various publications of the Congress that are distributed both at home and abroad, tell of the number and character of American naval vessels that have been designed for an exclusively oil-fuel installation, and therefore our weakness as regards the number and character of the merchant and naval oil tankers that we possess must be well known to foreign military experts. The various publications issued by the government even tell, in detail, of the tonnage, cargo capacity, and other important structural features of these ships.

*Our Inadequate Oil Reserve at all Our Industrial Centers in Considerable Part due to Our Maritime Weakness.*—The maritime feature is an important one, from whatever standpoint the question is considered. There are hundreds of industries in this country which would substitute petroleum for coal if an assured supply of the former combustible could be maintained. There are hundreds of industries that have experimented with petroleum with the intention of using it exclusively as a fuel, that have been compelled to return to coal, due to the impossibility of obtaining an assured supply of oil.

The cost and risk of transporting oil by cars constitute an insuperable bar to the distribution of the product in sufficient quantities to insure an adequate supply for large industries. Crude oil will, however, always be used for purposes wherein a substitute cannot be found, independent of the question of cost. It is, in fact, our dearth of water-transportation facilities that prevents the distribution of the product, and therefore limits the use of petroleum. There is no doubt that there are many important industries which, with the use of oil, would produce special articles that would find a ready and profitable sale in foreign countries, if they could be guaranteed that they would be able to get all the oil they required. It is well known that petroleum is an incomparable fuel for many industrial purposes, but no manufacturer dares to use the product except to a limited degree, unless his plant is so located that he can be assured of an adequate supply at other than a prohibitive cost.

*Should not an Export Duty be Placed upon Petroleum Products when Carried in Foreign Bottoms?*—When it is considered that the United States furnishes about two-thirds of the world's yield of crude oil, and that it is somewhat probable that, at least in this country, the maximum of annual production has nearly been reached, unless there are vast undiscovered pools of oil at lower depths than we are now able to drill, it ought to be possible for this nation to so regulate the export of the product as to conserve the industry in a manner that will best help ourselves, if not mankind. There are undoubtedly in the United States a sufficient number of steamship companies, railroads, and individual firms that would use all the oil produced in this country, if such plants could be assured of an adequate and reliable supply, and therefore the foreign export of oil may not be necessary in the disposal of the apparently large quantities produced.

In many industries the cost of the product is not a serious matter as compared with the particularly beneficial and industrial results that could be expected to accrue. It is all-important, however, in every enterprise, that, once an industry adopts a special form of fuel, such plants should be assured that an adequate supply of that fuel could be promptly obtained.

Many of the distillates of crude oil should even be regarded as munitions of war, and legislation should be enacted that would make it possible for us to prevent the export of oil at such times as we deemed advisable. Except for a brief period, it is extremely probable that, if we placed an export duty on petroleum, no permanent financial injury would accrue to any one interested in the drilling, refining, transportation, and distribution of the product. The writer has been told repeatedly, during the past 10 years, by various manufacturers and individuals, that it was solely the lack of assurance than an adequate supply of crude oil would be available that prevented them from using the product.

Probably no better way of helping to give the American merchant marine a reasonable share of the foreign oil-carrying trade could be devised than by placing an export duty on every barrel of oil exported from the United States in ships carrying a foreign flag. We are one nation that is unreservedly adopting the policy of fitting our battleships with an exclusively oil-fuel installation, and this installation is of such a character that, except at enormous expense, the structural change to coal-burning arrangements cannot be brought about. One of the most effective ways, therefore, of providing a supply at various points for naval purposes is to conserve the petroleum industry, by taxing the export of the product and by exercising the prerogative that logically belongs to us in controlling, to a limited degree, the sale of the commodity.

International comity and the law of nations sanction the policy of a nation placing an export duty on a commodity that it substantially controls. We are therefore justified in taking some radical means to control the maritime phase of the matter.

In the consideration of the problem of imposing an export duty upon petroleum, there are several phases of the question that merit thoughtful consideration and investigation. If serious thought is ever to be entertained of the proposition of imposing an export duty upon crude oil, the question may well be asked: "How will it affect our trade relations with China? Is the American illuminant of such superior quality that the Chinese would pay the additional cost that would be the result of such action? Have the foreign competitors of the Standard Oil Co. effected such improvements as regards refining the product that they can now furnish as good an illuminant as that which can be obtained from the paraffine-base product of the Appalachian region? Are our foreign competitors already making serious inroads into the sale of the American product in various countries? Would the loss of the petroleum trade of

the foreign countries, and particularly the petroleum trade of China, be followed by a marked reduction of other American imports into those countries?" The question of an export duty is therefore one which admits of a wide divergence of opinion.

*Conservation of Our Oil Resources.*—The conservation of our oil industry can only be brought about by some national organization like the American Institute of Mining Engineers taking advanced ground upon the subject, and urging that early and thoughtful action be taken in the matter. Various individual officials of the government, as well as individual experts, have urged such a course, but such individuals do not, in many respects, possess the machinery for being the proper central agency in bringing about such important action. The influence of the American Institute of Mining Engineers extends throughout the country, and, if it should recommend some thoughtful line of policy in the matter, there is no doubt that various commercial exchanges and maritime associations of the country would supplement the work of this Institute.

There is no doubt that the high purpose and urgent necessity of conserving the petroleum industry can be brought about in various ways, but the more study one gives to the matter the more impressed he becomes with the fact that, in the control of the maritime phase and in placing an export duty on oil shipped in foreign bottoms, it ought to be possible to do much, not only in conserving the industry, but in helping to bring about the restoration of the American Merchant Marine.

*Efficiency of Our Oil Tank-Car Facilities as an Agency in the Distribution of Petroleum Products.*—By reason of the wide extent of our country, the diversified character of its industries, and the limited number of existing oil pipe lines, the greater portion of the distribution of the crude oil product will have to be done by cars. The existing design and arrangement of these cars represent extended and thoughtful development. The facilities for the safe and economical storage and handling of petroleum products are undoubtedly in many respects of the most efficient nature, and there is no doubt that all persons connected with the crude oil industry are exceedingly receptive of counsel and advice that will improve the oil tank-car arrangements.

When there are considered the insurance and regulations, the danger attendant upon the transportation of oil by cars, together with the limited facilities for the storage of such combustibles in our various industrial cities, it becomes a question of paramount importance that wherever possible the car facilities should be supplemented in some manner, and that a greater distribution of the oil product be brought about by barge or through some other maritime agency. However great may have been the shortcomings of those controlling the petroleum industry, there is no doubt that, so far as tank-car equipment and storage facilities are concerned, an exceedingly earnest effort has been made by

the oil corporations to bring an adequate amount to the various industrial cities, and to store it in as convenient a location as possible. The oil-distributing companies, however, have been confronted with the problem that, at every important industrial center, there exists not only a dearth of oil tank cars, but a lack of freight-handling facilities. It has not therefore been possible, by reason of existing railroad terminal facilities, to give preference to the distribution and handling of crude oil when the railroad companies are confronted with the more serious and more important problem of handling the daily food supply of these great municipalities; and this, in general, is one of the reasons why manufacturers cannot get the oil they need.

*Our Lack of Merchant Marine a Serious Bar to the Development of the Crude-Oil Industry.*—One can well understand that it has been primarily due to the lack of suitable oil barges and tankers that makes the sea-going distribution, or maritime, phase of the problem a matter that concerns our industrial life. Under existing conditions the transportation of oil in American vessels to foreign ports is substantially a venture impossible of profit. On the Pacific coast it may now be possible; but, with the development of the Mexican fields and the opening of the Panama Canal, we may lose even that trade. The cost of operation of American-manned ships has been so great, as compared with the operation of foreign ships, that it is certain we cannot hold any foreign trade, and therefore it has fallen into the hands of our foreign rivals. The indirect financial loss to this nation in the loss of the petroleum export trade has undoubtedly been of vast extent. American crude petroleum is one of the products that is favorably received, if not eagerly sought, in foreign countries, and therefore the control of this special trade is of far-reaching importance to our manufacturing interests at large. Following the importation of petroleum products into foreign countries, there has almost invariably been a progressive increase of imports of other American articles to such countries. It therefore appears that, if there is one industry that needed the support of the government, or even that should have been heavily subsidized, it is that relating to the carrying of crude oil in American-registered ships.

*Nation's Reserve Stock of Crude Petroleum.*—It is significant to note that the petroleum stocks on hand in the United States at the close of 1913 approached about 130,000,000 barrels, a quantity that would not meet the nation's existing consumption for a period exceeding eight months. On Jan. 1, 1913, the reserve stock was actually less than that on hand Jan. 1, 1912. During the past year, however, there has been a slight increase in the reserve stock, although drilling for the product was stimulated in every State in the Union as a result of the increased price obtained for substantially every distillate and by-product of crude oil. It is of exceeding commercial, if not military, interest, likewise, to

remember that the yield for 1913 from every oil-producing State except California and Oklahoma was less than the yield of some previous year, despite the fact that progressively increased prices were obtained for the oil in every district of the country, and that oil fields which had been abandoned in previous years are now able, under existing conditions, to yield a profitable return upon the capital invested.

A very distinguished authority upon the California product has recently declared that, despite the continuous and careful research that has been made for oil in that commonwealth, the possible productive area of that State appears to be about 2,000 acres beyond that established in 1909, when Secretary Garfield, then the executive head of the Department of the Interior, ordered a survey to be made. He furthermore said that in all probability, nearly every crude-oil basin within that State had been located, and that there would be a constant drain and reduction in the reserve stocks that could be maintained there. In fact, another expert has asserted that, due to water intrusion and certain wasteful methods of production practiced in California, this country should be prepared to not a startling slump in the oil production of California. The wasteful manner in which drilling is being carried on in that State, taken in connection with the fact that the most important wells can henceforth be expected to show a progressively decreased supply of the product, affords some ground for the belief that the curve of production in that State may suddenly drop like the hump on the back of a camel.

As regards the thousands of miles of productive fields that are supposed to exist in Mexico, the United States Geological Survey, in its Advance Bulletin for 1914, states that, despite the phenomenal energy of crude-oil exploration work in Mexico, the fact remains that so far as the present supply is concerned the Mexican yield has been practically limited to a few large wells, and not to a very large number of smaller wells. It is questionable, also, whether many new wells are likely to be drilled under the peculiar conditions that exist in Mexico at present, and that may possibly exist for years, as regards shipments. It is extremely probable that the supply will not be sufficient to meet the demands of the numerous large-sized tankers that have been contracted for to carry the product from Mexico to England. It must further be considered that, with greater confidence developed as regards the Mexican supply, the price per barrel may increase rather than be reduced, because an assured supply from that country will not only stimulate refining, but tend to increase the oil consumption throughout the world. At present the Mexican yield is but 5 per cent. of the total yield of the world, and there is substantial evidence that most of the promises as regards Mexican development are not likely to turn into performances. It is even going to be for some years quite a serious matter to safeguard the Mexican wells from destruction at the hands of brigands and insurrectos.

*The Military, if not the Industrial, Necessity of Installing Additional Pipe Lines to Certain Points on the Atlantic Coast.*—By reason of the fact that the vicinities of Cape Hatteras and Cape Cod constitute certain storm centers, the insurance companies of the United States charge additional rates on ships that pass near these storm points. These additional rates of insurance likewise apply to the cargoes carried by the vessels. While the rates for approved sailing-ship transportation are less than those demanded for approved steamship transportation, the fact remains that all classes of vessels, whether steam or sail, are made to pay an extra insurance charge of about 10 per cent. when plying within range of the lighthouses of Hatteras and Nantucket.

There are undoubtedly urgent military reasons, if there is not an industrial need, that the leading transporting oil companies should extend their pipe lines to some point on the Atlantic coast south of Hatteras, and to another point either on Narragansett or Massachusetts bay. An oil pipe line leading to New England ought to prove a paying venture at least in the course of a few years, by reason of the increased quantity that would be consumed there, and the higher prices that would be willingly paid by the manufacturers if they could be assured of an adequate and reliable supply.

In the manufacture of illuminating gas, crude oil is an important and essential constituent, and it ought to be possible, without in any manner impairing the financial interests of those engaged in oil transportation, to make the New England project a desirable investment. The number and character of the industrial cities between Bayonne and Boston, and the possible extent to which crude oil could be used in the industries of those cities, ought to warrant the building of a New England oil pipe line.

However numerous and however large may be the containing tanks that may be installed, but which must be supplied either by tank cars or by sea-going barge or ship, there will be periods, as long as we depend on tank cars and due to the railroad terminal conditions at all our leading industrial centers, when the reserve stock will be of such a limited nature as to prevent certain users from obtaining an adequate supply; and it is for this reason that there appears to be an industrial necessity for a New England oil pipe line.

The construction of a pipe line from the West Virginia fields to some port south of Hatteras—a port which possesses the deep-water facilities of Charleston, is a national necessity, and if necessary its construction should be subsidized by the government. The far-reaching influence of providing an ample supply of oil to naval vessels alone cannot be over-estimated, and a pipe line to some point on the Atlantic coast south of Hatteras may eventually develop into a military necessity. Our sea-going battleships that are fitted with exclusively oil-fuel installations, together with numerous destroyers that burn oil exclusively, require

terminal pipe-line facilities at some point south of Cape Hatteras, and the construction of a pipe line from the West Virginia fields to Charleston ought to be given early consideration. Fortunately for the interests of the Navy, there are several oil pipe lines leading to Gulf ports.

*The General Problem of the Conservation of Petroleum Should be Considered by a National Commission of Experts, Representative of all Interests Concerned in the Question.*—Neither the direct value nor the indirect worth of the ocean oil-carrying trade to a nation may be within our power to estimate. The far-reaching importance, however, of the maritime feature of the petroleum problem is best evidenced and manifested by the fact that, although the petroleum yield of the British possessions does not comprise even 1 per cent. of the world's production, there was appointed on July 30, 1912, by the British Ministry, a Royal Commission on Oil Fuel for the Navy. This Commission was headed by the ablest naval officer, in some respects, that has been borne on the Navy List of England since the days of Nelson.

In order to demonstrate the importance which Great Britain attaches to the work of the Commission, the personnel of that body included the Director of Naval Construction, the Engineer-in-Chief of the Navy, representatives of the shipbuilding firms and shipping interests, together with representatives of every important interest concerned in the extension and development of the petroleum industry.

While this Commission has made several confidential *ad interim* or preliminary reports, it is extremely important to note that this distinguished array of experts has not yet found it possible to submit its final report to the British Ministry. These experts evidently believe that the more study that is given the matter, the more important appear the possibilities.

If there were impelling reasons upon the part of the British Ministry to appoint such a Commission, although England's distinctive industrial interest in the matter is primarily based upon the distribution feature of the oil product, it would appear much more important that this country should give equal consideration to the problem. In fact, however, it is the military possibilities of the problem that concern Great Britain and should we not be more concerned as to this phase of the problem?

The Liquid Fuel Board of the Navy, a Board which carried on the most exhaustive series of tests that have ever been conducted in determining the relative value of coal and oil as a fuel, made the following recommendation in submitting its report in 1903. It is pertinent to state that these tests continued over a period of 30 months, and that the direct and indirect expenditure involved in the work exceeded a quarter of a million dollars.

"In view of the fact that 48 per cent. of the world's output of crude petroleum is produced in the United States (it is now 63 per cent.), and that practically our entire

yield is secured from fields which are in pipe-line communication with important maritime and strategic ports, the Board considers that a joint commission, representing commercial, manufacturing, and maritime and naval interests, should be authorized by the Congress, whose provisions it would be to formulate such rules and regulations as would provide for the economical, efficient, enduring, and safe fuel installation."

Far-reaching as may have been the above recommendation, there have been such important developments in the petroleum problem during the past 10 years that it now appears more imperative than ever before that such a Commission should be appointed. Its duties should be of a much more extensive nature than recommended by the Liquid Fuel Board of the Navy. Its scope of inquiry should include every feature of development from prospecting for the product to the distribution of the commodity. Particularly should its work include the important problem of conserving this great industry to the benefit of our commerce and the defense of this nation.

This meeting of the American Institute of Mining Engineers affords an opportune time for giving some serious consideration to the question of conserving the petroleum industry, and to the appointment of a national Commission that would outline the nature of the work that should be entrusted to such a body.