

research men is where there can be found an ample, abundant and practical supply of oil for power purposes. These have gone so far as to say that the internal combustion engine will be the engine of the future, as far as the British navy is concerned, and it impressed me very much when I had a call from two distinguished British gentlemen, who are vitally interested in this investigation of the oil resources of this province; they came here and looked over the oil resources and became impressed with the quality and quantity of the supply in this country. The great object is to have under the British flag a source of supply of those natural resources essential to the carrying on of national undertakings. I regard the development of the oil shale business as of very considerable importance and that we should know what we have available in the province, what value engineers place upon them, etc. . . . The Empire must have supplementary supplies of mineral oils. *Ed.*

"We had some investigation in 1910 in reference to oil shales, and so far as the investigation went it has not been entirely satisfactory, nor has the research work been carried on to the extent I propose to carry it on if we can procure the proper men. It is conservatively estimated that there are at least five hundred million tons of shale in an area of one particular county that can eventually be worked profitably. This is calculated from the strata exposed in various sections of McLellan's Brook, Shales Brook, Steep Brook and Marsh Brook. The thickness of the shale is from 80 to 100 feet, which can be worked open cast. The continuity and uniformity of the deposits have been proved by borings possibly 1000 feet deep, in various parts of the field.

"Mr. Lucas, in the final report of the Fuel Controller, says:—

"We have in some parts of Canada, most notably in New Brunswick and Nova Scotia, very large deposits of oil shale. In Nova Scotia alone, in Pictou County, there is estimated to be five hundred million tons of oil shales, which will yield a minimum of thirty gallons of oil to the ton, of which 50 per cent is available for motor fuel. The remainder makes fuel oil, lubricating oils, and greases. It is estimated that these shales will yield four hundred million barrels of oil, and seven million tons of ammonium sulphate. . . . The oil shale industry in Scotland has been a very profitable one for years, where they have distilled a lower grade of oil than ours, and in most cases they had to mine it the same as coal. Most of our deposits could be mined by open pit methods. This fact, together with the high yield of oil, should make the development of these deposits a very profitable investment, and still further aid in expanding Canadian industry, and supplying products now imported or manufactured from imported raw materials. Then he (Mr. Lucas) goes on to give some notes as to the experiments made in testing out this (Pictou County) oil shale. Messrs. Williams, Miller and Robertson, of Edinburgh, Scotland, consulting engineers to the Pumphorson and other Scottish shale companies, in a report made in 1911, estimated that within less than one third of the areas, and considering the average thickness to be

24 feet, there are one hundred million tons of shale in sight that can be worked by open pit methods. One seam alone from which the samples taken averaged 40 gallons of oil and 79 lbs. of sulphate of ammonia a ton, is reported to contain thirty million tons. There are two varieties of shale in this field a cannel shale containing 18 to 30 p. c. of fixed carbon and a curly shale. There appears, however to be only one seam of the latter. This is from 5 feet to 6 feet in places, and averages 60 to 75 gallons in oil and 35 lbs. sulphate of ammonia. The shale from the other beds will average from 20 to 50 gallons of oil and from 30 to 70 lbs. of sulphate of ammonia. Some of the overlying thickly laminated shales yield as low as twenty gallons to the ton, but taking the whole mass the average is far above the Scottish yield. In Scotland shale as low as ten to fifteen gallons per ton is commonly mined and this from a depth of from 1200 to 1400 feet in comparatively small seams."

"Then I have reports from other engineers who made very definite tests of the content of these shales in this particular locality. They show that there is anywhere from thirty to forty gallons per ton of oil, besides a large per centage of sulphate of ammonia—and other by products, equally valuable. We have made some progress in an effort to develop these shales and we have made an arrangement with a company to lease certain areas. These English engineers have become interested in the shales and there is assurance that within a reasonable time the content of these shales can be verified. . . . we may have a considerable industry developed in this province in connection with the oil shales, second to none on the continent of America."

Another matter that came to the notice of the Department during the year showing to some extent the importance of our province in mineral resources, is Salt. I do not propose to discuss the matter at length because it may be sub judice. I refer to the subject of Malagash salt. I do not think that it will be a surprise to members, yet it may, and may also be to the people of the province at large, to know that in the County of Cumberland there is a deposit of salt which may be the only deposit of rock salt in Canada. There are other rich deposits of salt, particularly in Ontario but the salt mines of Ontario are deep, and the only way the salt can be procured at the Windsor Salt Works—or near Windsor—is by first boring down 1200 to 1400 feet, then letting in water, then pumping out the brine and afterwards distilling it. The deposit of salt discovered at Malagash will be the only salt deposit worked from an open mine in Canada. The deposit, it is asserted, is very valuable. I am not claiming to have positive proof that the deposit is most valuable, nor am I committing myself to any possible settlement with those who own the land, but I think it is worthy of interest to show what possibilities there are in Nova Scotia in the way of mineral exploitation. Not only is there a very large deposit of salt at Malagash—I will not say how rich it is for that is a matter of chemical analysis,—but there is certainly evidence of a large deposit of salt, which can be mined without the necessity of dissolving the