

APPENDIX No. 1

only by persistent improvements in plants, by the exercise of rigid economy along all lines, and by close attention to the business end of the undertaking have the promoters at last achieved success.

With the Albert shales, the discovery of the great vein of albertite which was mined for nearly 30 years at a large profit, enabled the working of these shales to be continued till the vein itself was supposed to be exhausted. The next stage, both in New Brunswick and Nova Scotia, was the attempt to find crude oil by boring, and in this work many thousands of dollars have been somewhat foolishly spent, since it has been well established that shales of this nature do not readily yield native oil by boring, but only by destructive distillation. In support of this statement it may be mentioned that not only in deep workings of the Albert mines, but in all the numerous drifts, shafts and borings in the Scotch shales for more than 50 years, only the merest indications of native oil have as yet been observed. This result has also been found in the numerous borings made in the Devonian rocks of Gaspé, of eastern Nova Scotia and of eastern New Brunswick, so that it may fairly be maintained that the only method to be pursued to obtain oils from these bituminous or oil-bearing rocks is to subject them to destructive distillation as has been done so successfully in Scotland, in Germany, France and elsewhere.

Fully realizing the great possible future of the shale industry, the several Scotch companies resolutely grappled with the problem of their distillation, new methods of retorting and refining, new uses for by-products, new markets and new economies were installed, so that they have managed successfully to keep pace with the requirements of the industry. By this constant practice of making improvement along every possible line, the surviving Scotch companies (for many went to the wall in the struggle) have successfully combatted the opposition arising from the native oils of the United States, of Russia and other foreign countries, and to-day are not only able to point to an ever-increasing annual output of oil of the highest possible grade, with the attendant by-products, but to an ever-increasing dividend sheet as well, and for some years the amount of oil produced from a limited area of the oil-shales a few miles west of the city of Edinburgh is several times larger than that obtained from all the oil-wells in Canada.

In geological position and in general character the Scotch oil-shales agree very closely with those found in the maritime provinces of Canada. They occur at the base of the lower carboniferous limestones and above the red sandstone of the Devonian in Scotland, while in New Brunswick and Nova Scotia they unconformably underlie the limestones and appear to be a portion of the Perry sandstone formation which represents the upper division of the Devonian in eastern Canada. The oil bands in both countries occur as interstratified layers in other less bituminous shales of various colours, which sometimes are marly, and contain thin limestones and sandstone. The percentage of crude oil and of ammonia varies materially in the several beds in the field, and even in portions of the same bed. In thickness the oil-shale bands range from a few inches to several feet, the Scotch shale agreeing very closely with these in eastern Canada, the thickness in one place at least being about 15 feet, while the greater number are from four to seven feet. In the Scotch oil-shales now worked, the crude oil rarely exceeds 25 gallons per ton, and the sulphate of ammonia 25 to 40 pounds, though exceptionally higher yields are sometimes met with. These figures are somewhat lower than in the early stages of the industry, and, as a rule, the shales near the lower portion of the series are lower in oils, but higher in ammonia, as can be seen in the beds of the Pumpherton series, which are the lowest now worked, and where the oils are from 15 to 20 gallons to the ton, while the sulphate of ammonia is from 50 to 70 pounds, which in Scotland is considered a very high yield.

Prior to the tests made last year in Scotland of a shipment of New Brunswick shale, it was difficult to obtain reliable information as to the actual value of the oil-shales of this country. This test consisted in putting some 45 tons of oil-shale from