

APPENDIX No. 1

By Hon. Mr. Comeau:

Q. Can this lignite coal of Alberta be mined as easily as other coals?—A. Some of it can, but the timbering is dearer. It is found in areas where very little timber is to be had.

Q. How does it compare in market value with a fair quality of coal?—A. At Edmonton they sell coal at from \$3 to \$3.50 a ton, delivered on the streets, while the Lethbridge coal, which is bituminous, or nearly bituminous, sells at \$8.

The CHAIRMAN.—I should like to direct your attention, Dr. Brock, to evidence taken before this committee at the last meeting. Mr. Von Hammerstein was the witness, and he gave us a good deal of information about the tar sands of the Athabaska country.

Dr. BROCK.—The overlying rocks thin out going eastward and northward. You have the greatest thickness about on the line of Edmonton, Calgary and Macleod. That is on longitude 114, and between the 49th and the 54th parallel. That would be about the greatest thickness, as there is the full thickness of the cretaceous and some Tertiary rocks.

Q. Is that in the Rocky Mountains?—A. No, east of the Rocky Mountains.

Q. In the Foot Hills?—A. East of the Foot Hills, when you get into the Foot Hills the rocks have been folded, and there has been more removed by erosion, and when you get into the mountains you get into the lower formations. As you go northward from Edmonton you pass successively out of the higher members into the lower members, and down Athabaska river you pass out of the Cretaceous rock altogether and get into the under-lying Devonian. The river itself has quite a valley, and you have the Devonian formation exposed, while on the banks for some distance down you have the Cretaceous rocks still remaining. The lowest Cretaceous is a sandstone, what is known as the Dakota sandstone, and along the exposed edges of that along the Athabaska river you find it impregnated with tar, forming about 12 or 13 per cent of the rock. Those are what they call the tar sands. There is a very large area of those sands. Of course they have not been thoroughly explored, but Mr. McConnell made an estimate—

Q. Would that be the same country that Mr. Von Hammerstein gave evidence on before the last meeting of the committee?—A. He probably spoke of where he had been boring. It has relationship to that. Mr. McConnell's estimate amounts to an area of 1,000 sq. miles containing about 28 cubic miles of tar sand, and at twelve per cent tar content would amount to about six and a half miles, according to his estimate. Now that tar represents, in all probability, petroleum which was held in the Dakota sandstone, and which has escaped along the exposed edge and has lost its more volatile constituents, leaving the tar base. That process would tend to seal those rocks, so I do not think that all the petroleum that has been contained in the Dakota sandstone has escaped to the surface. It would naturally tend to seal the passages along the exposed edges and prevent further escape. The petroleum or tar springs which they speak of, in many cases, I think, result from the fact that when the tar gets heated it becomes soft, and the more volatile material becomes fluid and flows down. Mr. Von Hammerstein has been boring down the Athabaska beyond Fort McMurray below the tar sands, in the Devonian limestone. It is quite possible, in fact altogether probable that the petroleum originally came up through the Devonian. According to McConnell the Devonian rocks throughout the MacKenzie valley are nearly everywhere more or less petroliferous and over large areas afford promising indications of the presence of it. But the number of points of escape, the lack of retaining were above the Devonian in the northern part of the Mackenzie, and the tremendous amount of oil that has escaped as shown by the volume of tar sands, make it uncertain whether oil in commercial quantities has been retained in the Devonian. It is a matter that can be determined only by boring. The formation that we in the light of present knowledge,