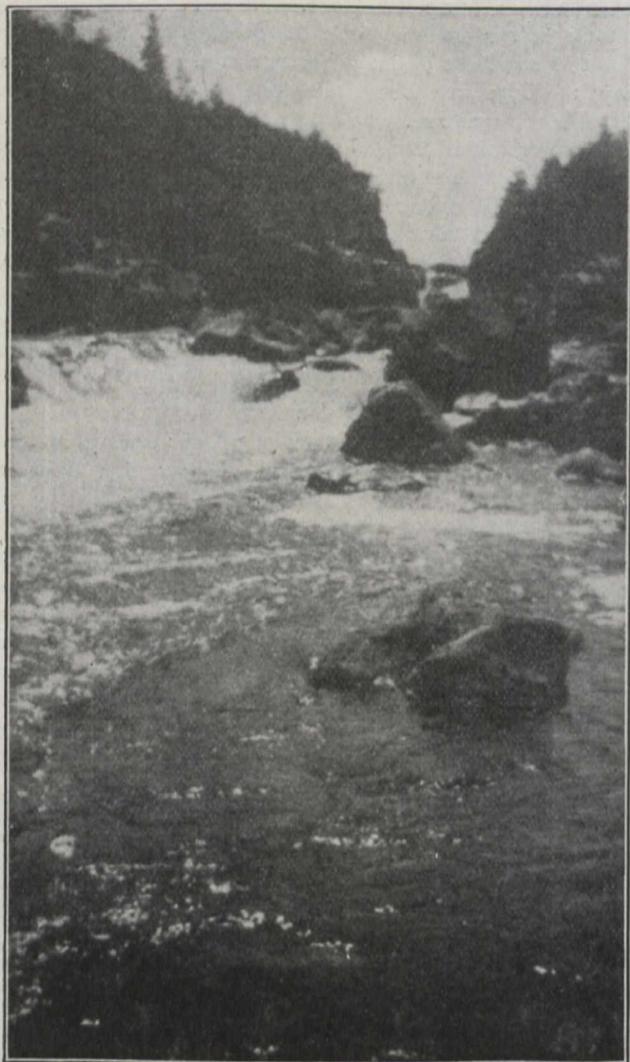


Lignite.

Lignite has long been known to exist in the Moose River basin of northern Ontario, having been reported on almost every river of the James Bay water-shed. The economic possibilities of most of this lignite were investigated and reported upon for the Bureau of Mines in 1904, by J. M. Bell. New and rather extravagant reports, however, were circulated during the winter of 1909-1910 to the effect that real "coal" had been discovered in the vicinity of the Grand Trunk Pacific Railway on the Mattagami River. Several square miles of claims were staked out and recorded. A very brief examination served to convince the writer that the deposit had few economic possibilities.

Lignite or brown coal may be described as a fuel about half way in the state of carbonization between peat on the one hand and bituminous coal on the other. The term is a



Foot of Smoky Falls, Lower Mattagami River..

loose one, and includes materials of wide divergence in chemical composition, in texture, and even in mode of occurrence. The "braun kohl" of Saxony is so soft that it is dug from the field with spades, and piled in great stacks to dry, when it forms a valuable fuel. On the other hand, the lignites of the Western States and those of Western Canada are black, comparatively high carbonized, firm, even with conchoidal fracture, and require to be broken with a pick. The lignites of the Moose region are, considering their recent age, in a remarkably advanced state of carbon-

ization. Some of them compare favorably with the lignites of Souris and Lethbridge, others are typically brown resembling the German variety. The lignites of northern Ontario are of interglacial age, occurring in stratified beds of clays, sands, etc. These coal measures occur extensively throughout the whole Moose Basin, but they do not always carry lignite, although in general they are more or less carbonaceous.

The lignite of the Mattagami River outcrops at the east bank about one mile up-stream from Big Bend, or about eighty miles down stream from the railway. The outcrop cannot be seen except in the lowest water. It then shows in two narrow seams dipping into the east bank at an angle of about 50 deg., and striking W. 30 deg. S. The upper seam is six feet thick at the thickest place; lying below this is four feet of clay quite dark and lignite in places, followed by one foot of lignite, below which is a fat lead blue clay. This was bored into for sixteen feet without showing further lignite.

These lignites do not occur in beds associated with consolidated rocks, but in beds both overlaid and underlaid by clay and sand of inter-glacial age. All this series is absolutely free from boulders or other glacial material.

The lignite is in beds of quite irregular thickness; in places these are warped, shoved, ploughed, and crushed out of shape. The folds are often cut off by glaciation, at other times the beds are cut out entirely by glacial erosion.

Most of the lignite is laminated, showing stems, twigs, leaves and reed-like characters, but buried in this looser material are many sections of the limbs and trunks of trees (see Fig. 1). By digging up some of the lignite a few of the larger of these trees were secured, the largest one measuring seventeen inches in diameter. This would represent a rather substantial tree before compression. Scattered abundantly through the loose lignite are fragments of perfect charcoal, which have been preserved as fragments of charred wood, as if a fire, probably started by lightning, had passed over this area.

Analysis of Lignite.

	Fixed Carbon	Vol. Combust.	H ₂ O	Ash
Lethbridge, Alta.	54.93	26.87	12.08	6.12
Golden City, Colorado ..	45.57	37.15	13.43	3.85
Moose River, Ont.	44.03	41.39	11.74	2.84
Souris River, Man.	40.72	38.58	16.92	3.78
Big Bend, Mattagami River	40.31	39.24	11.45	9.00 ¹
Big Bend, Mattagami River	40.53	46.44	11.22	1.81 ²
Blacksmith Rapid, Abitibi River	36.58	39.66	16.46	7.28
Big Bend, Mattagami River	26.25	40.43	72.27	21.05 ³

From the amount of carbonization that the lignite in general has undergone, as shown by the preceding analysis, it can be seen that this lignite is of rather low grade, but is sufficiently carbonized to produce a good fuel if briquetted.

Iron.

The iron ores on the Mattagami River were discovered by Dr. Robert Bell and later examined by J. M. Bell. Both

¹ Woody lignite, light yellow ash.

² Fragment of tree, jet-like.

³ Mossy, loose, reedy; reddish ash.