

# The Canadian Engineer

## An Engineering Weekly

### IRON AND LIGNITE IN THE MATTAGAMI BASIN.

The route from the Grand Trunk Pacific railway to the iron and lignite areas of Northern Ontario is necessarily by canoe. The area may be reached from three different starting points on the Grand Trunk Pacific, as three large rivers, the Mattagami, the Ground Hog, and the Kapuskasing, converge to form the lower Mattagami, on the banks of which the principal deposits exist.



**Tree Trunks and Limbs Buried in Lignite.**

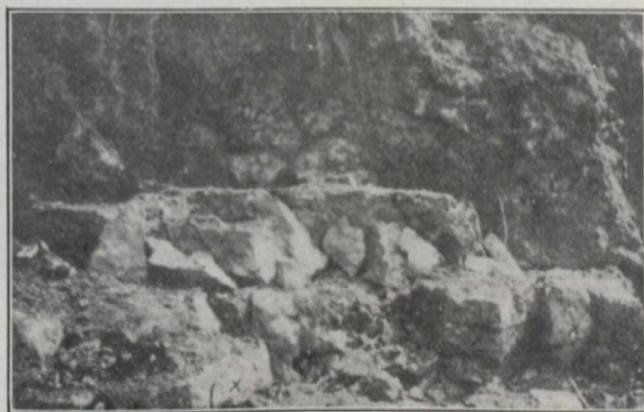
In the twentieth report of the Bureau of Mines of Ontario Mr. M. B. Baker describes these deposits.

Ever since the emergence of the Laurentian plateau from the Archean sea, a height of land appears to have been maintained between the Great Lakes and the basin of Hudson Bay. Within this basin a series of later sediments, including Paleozoic and Pleistocene accumulations, has been deposited. A similar but more extended series has been laid on the Great Lakes flank of this old barrier. The Hudson Bay basin therefore presents a well-marked geographical as well as geological basin, bounded by a distinct rim of pre-Cambrian crystalline and metamorphic rocks. This latter area presents a somewhat rough undulating surface, dotted by many small lakes, marshes, swamps and muskegs, and has a steep grade towards James Bay from all sides, as is clearly shown by the convergence of the many splendid rivers which flow down its slopes. The rapid descent is most pronounced where the pre-Cambrian approaches the margin of the Paleozoic sedimentary area. As a consequence, the "long portages" on all these rivers occur at these points. Once the sedimentary area is reached the flow is very rapid but gradual all the way to Hudson Bay, so that no portages are necessary for practically the whole journey.

The Laurentian plateau in northern Ontario is commonly styled a rocky country, but several seasons of field work in that part of the province have led to the conviction that the amount of rock exposed is very much less than is commonly

supposed. In fact, except at rapids or falls, where rivers have cut rather deep gorges in the drift, there is scarcely an outcrop of rock to be seen in the country, so that it is essentially an agricultural one. The Paleozoic area has a flatness that is monotonous, and is perhaps too wet and flat to admit of sufficient drainage for agricultural purposes. Moreover, the upper portion of this area is sand and is quite unsuited for agriculture. The oldest formation seen in this area is the Laurentian. It consists almost entirely of typical pink granite gneiss, but varies in many places to a hornblende granite or mica granite. The rock for the most part is coarse grained, and consists chiefly of three minerals, quartz, orthoclase, and biotite mica, with various accessory minerals, the chief of which is microcline. All the feldspar is more or less decomposed, so that the weathered surface of the rock has a distinct kaolinic appearance. Practically the whole of the pre-Cambrian area north of the railway is this pink gneiss, of very uniform character throughout.

Cutting this in all directions is a series of diabase dikes. These dikes are the typical post-Middle Huronian diabase of the north country, and do not seem to differ in any way from the diabase of other portions of northern Ontario. They vary in width from mere stringers up to 250 feet. They are dark gray, medium to fine grained diabase, composed of laths of fresh labradorite feldspar, set in a ground mass of augite, which is partly in felt-like aggregates resembling urallite, and partly in larger well defined crystals and grains. A little original quartz is to be seen in thin sections, and often in the hand specimens, together with accessory pyrite



**Ore Body Resting on Limestone.**

and magnetite. At several places, calcite veins were found up to three inches in width cutting this diabase, but they did not show any of the silver, nickel or cobalt minerals so characteristic of similar occurrences in the Gowganda or Elk Lake areas.