

are pronounced by miners to be liberal and to suit the requirements of the country.

The Rocky Mountains of British Columbia are rich in mineral wealth, which would long ago have been developed could facilities have been provided for importing provisions and machinery and exporting the product of the mines. The construction of the Canadian Pacific Railway will remove the difficulty, and an influx of prospectors, miners, and speculators will follow. At Quartz Creek, about forty miles from Kicking Horse, B.C., placer diggings have been discovered which, it is thought, will pay from \$10 to \$20 per day, per man. These diggings were worked many years ago and abandoned on account of their utter inaccessibility.

**GEOLOGICAL SURVEY.**—The investigations of Mr. A. Rowman in the interior of British Columbia last summer embraced an area of about 30,000 square miles, lying between the 113th and 120th degrees of longitude and the 49th and 52nd degrees of latitude. Through this region the Canadian Pacific Railway will pass, and the geological surveys will, therefore, become increasingly interesting. Preparations are now being made to issue a new map of this region, in which will be shown the results of the labours of Mr. Rowman last year, and the survey

made in 1882. The report of the Minister of the Interior says: "The researches made in the vicinity of the Rocky Mountains prove the existence of large tracts of coal-bearing cretaceous rocks in the very heart of the range, of which the anthracite region of Devil's Head Creek is a special development."

#### NORTHERN CANADA.

Captain William Kennedy, of St. Andrew's, an Arctic explorer, in a lecture delivered at Winnipeg, drew attention to a region near Lake Athabasca, into which the Peace River flows, where he stated that petroleum springs had overflowed, covering a section of country forty miles in extent, and after having been carried down the river the oil floats on the surface of the lake. At present the Indians, who are its only consumers, boil it down to the consistency of pitch and apply it as a coating to their canoes, etc. Captain Kennedy also stated that in the same region salt is abundantly found, fine and brilliantly white, and that a variety of economic minerals have been met with in large quantities, notably—sulphur, coal, copper and asbestos. He expressed the opinion that the Athabasca district, with its vast mineral wealth, would shortly become a point of attraction for capitalists and settlers.

capitalists found the money to carry on work for the summer to test the value of these deposits, and Mr. Ingall once more took charge of the work.

Shafts were sunk upon the two veins to test their continuity in depth and further explorations of the rest of the location carried on.

One of the veins, a promising lode of rich argentiferous sulphuret of copper, was found not to continue down, but the other, a strong well defined fissure vein, carrying native copper, got richer as depth was attained and retained its definite character. Further evidence was also obtained as to the general mineralization of the district, and other veins were found worthy of further attention.

These favourable results induced the syndicate to put up a further sum to enable work to be continued during the winter of 1881-82, and it was decided to sink another shaft further inland on the course of the vein at such a distance that a drift could be run and the two connected before spring so as to secure good ventilation for continuing the work during the ensuing summer should it be decided to do so. This was done, the two trial shafts having been connected at a depth of sixty feet, although, on account of having cut heavy water, great difficulty was experienced in completing the work in time.

This work was considered to have been attended with such satisfactory results that the company was finally organized on a permanent basis in the spring of 1882, and started with a share capital of £100,000, of which the vendors took £25,000 fully paid shares in payment for the property. The board of directors decided then to at once equip the mine with a full plant of dressing and developing machinery.

This of course entailed an enormous amount of work in order to convert a barren shore, covered with second-growth bush, and with only a couple of shanties on it, into a prosperous and busy little village in one short season between the opening and close of navigation on the lake, which period is also shortened by the stormy weather of the spring and fall, rendering it impossible at those seasons to utilize the lake communications more than about one-third of the time. During the whole summer, large quantities of materials, supplies, tools and machinery were poured in and the force was gradually augmented as housing accommodation increased, until some 150 men of various callings were employed, and by the end of the season, most of the necessary buildings were up and the rest well forward or started. Most of the machinery was also on the ground, the saw-mill, hauling engine, air compressor and mine pump being in place.

The worst part of the surface work having been got over by the fall of 1882, when Mr. Ingall was obliged to resign from ill-health, the actual work of underground development was able to be vigorously prosecuted under the direction of the present manager, Capt. Williams, and with the help of compressed air drills, good progress was made, so that the state of things was as follows to October 1st, 1883:

The two main shafts of the mine, some 450 feet apart, were at the respective depths of 221 feet (No. 1), and 152 feet (No. 3). The first level had communication through between Nos. 1 and 3 shafts, and had been extended a considerable distance N. of No. 1 shaft (*i.e.* out towards the lake), and S. of No. 3 shaft (*i.e.* inland), and work had been done on the outcrop of a vein 3,000 feet inland from No. 3 shaft supposed to be the continuation of this vein.

The second level had been driven from each shaft towards the other, and only wanted some 60 feet to communicate, and was also driven a considerable distance N. of No. 1 and S. of No. 3, whilst the third level was driven some distance N. and S. of No. 1. The total length of these drifts amounted to some 1,800 feet, and they, in conjunction with the shafts, proved the vein for some 800 feet in length by about 200 feet in depth.

The plant at that date consisted of a Reliance air compressor capable of working ten Eclipse power-drills, hauling engine and direct acting Northey steam pump at No. 1 shaft, also a diamond drill, saw-mill, stationary engine, to bring up freight from the dock, etc.

The dressing machinery is housed in a building 160 feet long, whose greatest width is 95 feet and greatest height 45 feet. It consists of one head of Ball's stamps capable of putting through 145 tons of this ore per day, the copper being extracted by four jigs and four round briddles. The ore is raised to the top of this building up an incline from No. 1 shaft, worked by an engine which also works the Blake stone breaker, from which it passes down a long incline to the stamp, from thence through the jigs, etc. The necessary water is delivered to the floors from the lake through a seven-inch main by a direct acting steam pump. There are also a fine boarding house capable of holding 100 men or more, a well built and roomy store, the usual repair shop, smithy and carpenters' shop, and stable for twenty-four horses which are chiefly used to bring in cordwood from the bush. There is also a dock within 100 yards of the mine at which, in settled weather, light draft propellers can unload.

The floors commenced running on the 3rd of October last, and at the close of navigation last fall an instalment of some three barrels of dressed metal, about 85 per cent. fine, was shipped to England. Up to the 1st of April last the Manager estimated the amount of ore opened up at some

## The Lake Superior Native Copper Company's Mines.

This company's property is situated at Mamainse on the Canadian shore of Lake Superior, in the District of Algoma, and is some sixty miles from the village of Sault Ste. Marie.

Until quite recently no other means than by water existed of communicating with the outer world, which entailed an immense amount of trouble and delay. When the company started mining operations, everything—coal, provisions, machinery and a large quantity of building material of all descriptions, now to be found on the spot, had to be brought from Batchewana Bay, over a stretch of water which, for a great portion of the season, was dangerous and uncertain. The nearest doctor, the nearest post office and stores, could only be reached by travelling these sixty miles in an open boat, so that communication with civilization during stormy weather was impossible, and rendered tedious under the most favourable circumstances.

In the winter, even, this means of communication was absent, and the mail had to be carried over a round-about snow-shoe trail through the bush. Now, however, the continued operation of the mines has brought about a happier state of things. The company has a steamer which, in summer, plies between Sault Ste. Marie and the mines, and in winter a road lately completed by the Ontario Government serves to keep up communication. Around the mine itself has grown up a busy little village which forms quite a feature in the landscape as seen from the lake. It has also a post office and a Government school, whilst anyone being so unfortunate as to meet with an accident, need not, as formerly, have to wait for fine weather and then take two or three days to get to the doctor, but receives prompt attention from the resident medical man, Dr. Peters.

The location now worked by the Lake Superior Native Copper Company, belonged formerly to the Quebec and Lake Superior Mining Association, who held it for some thirty years and did nothing with it until July, 1880, when they employed Mr. E. D. Ingall to examine the tract and report upon the mineral capabilities. Some seven weeks' exploration of the approachable portion of the ten square miles, composing the property, proved to be widely mineralized and that there were two veins worthy of further work being done on them. During the winter of 1880-81, nothing was done, but in the spring of 1881 some English