Porcupine Mining Institute

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commenced to modernize by substituting concrete buildings for wood.

Among the concrete structures may be mentioned the big five-storey Goldstein Building, the new fire-proof Cain Hotel, Post Office and a number of other five-storey buildings. During the period mentioned $1,500,000 has been expended in new buildings in the town. On an average, 26 ocean-going vessels arrive with cargo each month, and 40 steamers call, including those south-bound from points north and west.

The town recently established an up-to-date fire department with a part of the brigade constantly on duty and under pay, and everything in the town gives one the impression that it has come to stay.

The history of Juneau begins with the discovery of placer gold by Joseph Juneau in the year 1880. The location of quartz claims followed almost immediately after the discovery of placer, but little was done in the way of development for some time.

What ever development was attempted seemed foredoomed to failure on account of lack of knowledge and sufficient funds to operate on the proper scale.

It is only in recent years that Juneau has come into its own. Great credit is due to those financially interested as also the engineers who have studied the requirements and attacked the various propositions on a mammoth scale, thus establishing an immense body of ore, without the great expenditures made in plant for mine and mill, would be only so much waste.

Climate.

The climate of south eastern Alaska, owing to the sweep of the Japan current, is mild and equable. The temperature seldom rises above 80 degrees and rarely descends to zero. The daily mean for the year 1913 was 42.7 and for 1914, 41.8. The warm sea air coming in contact with the high mountains on the coast and their glaciers produce a generous rainfall. The average rainfall at Juneau is about 75 inches annually. The following table gives the mean temperatures by months for the year 1914:

July	52.7	January	25.6
August	61.7	February	33.2
September	47.3	March	36.2
October	45.5	April	42.7
November	34.0	May	47.3
December	26.3	June	59.5

Daily mean 41.8.

Coldest day during winter 1914-15, December 1, 1914, 1 above zero.

This mild climate prevails over a narrow strip of coast line only, the winters in the nearby mountains being long and severe with heavy snow falls.

Transportation.

One of the great advantages of Alaska is the practically unlimited opportunity for water transportation, which is very cheap for both passengers and freight. Supplies required in a hurry may be obtained from Vancouver to Seattle in 3 days.

Water Power.

South eastern Alaska has great water power resources due to its numerous mountain streams. High mountains rising directly out of the sea afford opportunities of collecting and utilizing it for hydro-electric plants. Nature has built ready-made reservoirs for the plants now in operation.

The cost for electric power is $10 h.p. per year. It is estimated that when the project at Steel River, now under consideration, is completed, 100,000 h.p. will be produced at a cost not to exceed $5 per h.p. annually.

Mining.

Of the mining zones the most important is that extending for a distance of approximately 60 miles north and south of Juneau and known locally as the Juneau Gold Belt.

A number of mines have been developed in this ore zone and others are in the process of development.

The Treadwell Mine is located at Treadwell, across the Gasteneau Channel.

This mine has been operating for thirty odd years and has now attained a depth of 2,200 feet where the ore is said to be considerably better than on the levels above.

The mills crush 5,000 tons of ore daily and from the present mine development there is every reason to believe the production will continue at this rate for years to come.

The Treadwell Mines are not as fortunate in natural advantages as their neighbors on the Juneau side. Here the ore is harder and has to be hoisted which doubles the cost established at the Juneau Mines.

The average value of the ore at the present time is $2.10 per ton with a working cost of about $1.40.

Alaska Juneau.

The testing mill and plant of the Alaska Juneau Gold Mining Co. is located on the coast about two miles from Juneau (the mine being about a mile distant.

This mine has been under extensive development for the past three years, and it is one of the big mines of the country and like the Perseverance can be operated at a very low cost. At present the little pilot mill or testing plant is handling 500 tons from development.

Recently this company announced that $4,000,000 had been secured for mine development, mill construction and plant.

Ebner.

Considerable development has been carried on at this property by the United States Smelting Refining and Mining Co.

This property is adjacent to Juneau and is expected to develop into one of the big properties of the district.

Alaska Gasteneau Mining Co.

The mill and plant of this company are located at Thane about three miles from Juneau.

In February, 1915, the first unit of the mill was put into commission and is now handling a daily tonnage of 3,600 tons. The mill when completed will handle 12,000 tons per day. The ore comes from the Perseverance mine about 3 miles distant which has been under extensive development for the past three years in order to prepare for the production of ore, to supply not only this mill but another of equal capacity which is to be erected immediately, thus enabling them to treat 24,000 tons per day. Including the power plant at Salmon Creek the Company has expended upwards of $6,000,000 in mine development and plant.

Mining.

It is unique to find a gold mine with such an immense ore body and under such conditions as exist at the Perseverance Mine. The ore body which is 5,400 feet in length is from 120 to 200 feet in thickness and rises with the mountain 2,600 feet above the Gasteneau Channel. A haulage tunnel is driven into the mountain 800 feet above sea level which give a back of 1,800 feet.

This permits the ore to be handled by gravity from the upper levels to the 1,800 ft. level where it is drawn off at an elevation several hundred feet above the top of the mill.

System of Development and Mining.

Figures I and 2 present a plan and sections of the methods employed in developing the mine. Owing to the gravity system employed no hoisting shaft is necessary. A shaft for handling supplies connects the 1,800 ft. level with a level about 1,200 feet above at which level the camps and mine shops are located. From the supply shaft, levels are driven off every 200 feet and an ore pass is provided to drop all ore to the bottom level.

On each level a haulage tunnel is driven along and in the foot and hanging walls. These are connected with cross cuts about every 60 feet. Incline raises for loading chutes are put up every 35 feet along the crosscut and are raised to the stope floor above the main level a distance of about 18 feet. At the same time an incline raise is put up in the foot wall between levels and sub-level crosscuts are driven off into the stope.

By cutting out between raises the first stope is opened and the first sublevel crosscut is used for a travelling way into the stope.

The cost of explosives when spread over the entire tonnage broken and caved works out at 3 cents per ton and the cost of drilling at 2.5 cents per ton.

Leyner type machines are used throughout the mine, about fifty-five feet of drilling being a shift's work.

The stopes are put up from 300 to 400 feet in length for the entire width of the ore body. A vertical pillar of 50 feet is left in between stopes to hold the walls, which appear to stand well at an angle of 60 degrees from the horizontal.

After a small stope of about seven feet is taken out at the foot wall the balance will cave of its own accord. At times a hard spot is encountered and it is necessary to carry a stope over for 30 or 40 feet, but owing to vertical seams of graphitic nature the backs cave very readily.

By this caving system it is only necessary to stope about 6 per cent. of the ground.

The ore body is a very soft carbonaceous schist, with quartz stringers, the gold is associated mostly with galena and the iron pyrite carries some values. Considerable graphite is found in the ore, which renders cyaniding of the pyrite concentrates impossible. On the other hand, the graphite seams are very important factors in the caving system. Caves develop along these seams and the vibration from blasting the cut in the stope brings the ground down. The ore is usually drawn well down on the hanging wall to provide as much room as possible for the caving ground which breaks up pretty well in the fall.

Milling.

Jaw and Gyratory crushers are used for coarse crushing. A storage bin of about 5,000 tons is being cut out under the crushers in the country rock. From this bin the ore is conveyed by a 42-inch belt conveyor to the mill a Merrick weighing machine is installed on the belt, which records the weight.

The conveyor belt delivers the ore to stationary screens of one inch square mesh. The oversize is fed by iron apron feeders to 72-inch spring rolls and elevated by an Ottis elevator system operating two ten-ton skips in counter balance. The skips come to rest on a scale platform which automatically opens the storage bin doors, closes the same when full, hoists and delivers to a second set of one-inch screens, the oversize being recrushed in 54-inch rolls.

The product from secondary rolls and undersize from the one-inch screens is elevated by skips as noted above to the main storage bin.

From the main storage bin the ore is fed to Colorado Iron Works vibrating screens (10 square mesh). The oversize is recrushed in 54-inch rolls and returned to the main storage and the undersize sent to concentration plant.

The first concentration is made on double-deck Garfield roughing tables, where a rough concentrate is made. The tailings are sent to Richards hindered settling classifiers where the slime is removed and the sand is sent to waste.

The rough concentrates from the Garfield tables are sent to Wilfley tables where a clean concentrate of Galena which carries the bulk of the gold is taken off. This concentrate is readily reduced in pots to lead bullion and cupelled.

A second concentrate of Iron pyrite is also made on the Wilfley tables, these are sent to the smelter.

The tailings from the Wilfley tables are slimed in 5 x 20 feet tube mills, this pulp together with the original slime is passed over amalgam plates after which a lead and iron concentrate is made on Wilfley slime tables and handled in similar manner as described above.

The mill is of steel structure throughout, simplicity and durability being the outstanding features.

A recovery of about $1.20 per ton is made which gives an extraction of about 80 per cent. at a milling cost of about 25 cents.

The attached flow sheet while not accurate in detail will illustrate the general practice employed.

The total cost of operating is 75 cents per ton, which is expected to be reduced as the tonnage is increased.

Considerable attention is devoted by the company to the welfare of their employees. Sports and safety first organizations are well taken care of, and a spirit of team work is shown everywhere.

RECORD THUNDERSTORM OF THE GOLD CAMP

Was Last Sunday--Narrow Escape of May White--Timmins in Darkness For Some Time

From shortly after noon last Sunday the gold camp was visited by one of the most terrific thunderstorms yet experienced by many who have been long resident here and the heavy downpour of rain was described as the heaviest on record.

The early part of the day was very warm and bright and the gathering of ominuous clouds was the cause of predictions that a storm would follow. Those prophesying this, however had little idea of how true their words would come for once the rain started, following vivid and lengthy lightning flashes, it seemed as if the flood gates of the Heavens had been opened and for nearly an hour a battle of the elements was witnessed.

The main thoroughfares of Timmins with their concrete sidewalks proved an excellent target for the fury of the storm while side streets where any gullies existed exemplified the heavy downpour more forcibly by the deep streams here and there to be noted.

At the power house of the Northern Ontario Light and Power Company the lightning struck twice during the day but, contrary to rumor, the transformer was not put out of commission and those responsible quickly had matters righted.

After clearing away for a time and enticing many people to the sunshine again signs of a repitition gathered in the afternoon and before many were able to gain shelter a second storm burst over the camp.

"Don't Use Phone."

People having telephones were quickly warned, without official instructions, that it would be dangerous to attempt any communication in that way, the repeated sizzle and crackle on the wires immediately indicating the danger and impractibility of adopting such methods.

In this respect it should be mentioned for general information that **on any occasion when lightning is imminent the safest course is to leave the telephone alone until the storm has passed and the lightning ceased,** which method is adopted by the Telephone Company themselves in regard to the switchboard.

At the supper hour there was no electric light in town and only candle power was available in the various restaurants and residents for some considerable time.

Just a few minutes after nine vivid flashes of lightning again lit up the gold country and immediately the whole of the electric lights were extinguished. Under such circumstances as the hour of darkness controlled, the difficulties of the Power people to rectify matters were naturally considerably greater than during the day but shortly after ten o'clock the lights were again switched on and the candles dispensed with.

May White's Narrow Escape.

A report was circulated during the evening that a girl had been instantly killed by lightning during the afternoon storm while she was berry-picking at the Hollinger Reserve.

Fortunately for those concerned such proved to be a very exaggerated report. May Beatrice White, daughter of Mr. and Mrs. Peter White, of Timmins, however, had an experience which was the foundation for the rumor gaining currency.

May, who is approaching her fifteenth birthday, was in the vicinity of the Hollinger Reserve picking berries. She desired to leave the others for awhile to pick berries in another section and was warned not to stray away too far.

During her absence from the party the storm brewed and this is what May said to The Advance regarding her experience:—"I felt strange all over and afraid something was going to happen. The lightning was flashing and bark flying from the trees. I did not know what was coming so knelt down and began saying my prayers. For a time I remembered nothing then found I was under a tree and my brother was trying to reach me but could not because of the flying bark."

From what could be gathered otherwise the brother secured assistance and on the tree being lifted May was carried out and taken to Timmins by conveyances. Here she was attended to by Dr. Otton who found several severe bruises on her body and the little girl suffering from shock and no doubt fear.

No bones had been broken, however, and in the opinion of the Doctor the lightning had not struck her. That she had experienced a marvellous escape from being killed, however, was the opinion expressed.

The first news to reach Mrs. White naturally gave that lady considerable cause for alarm and anxiety but on realizing that her little daughter was safe, beyond the injuries related, the mother immediately set about caring for her in the best possible manner and on Monday morning the patient, although still confined to bed, was able to talk a little and has gradually recovered from her experience.

QUIPS AND CRANKS.

Joseph Chamberlain was the guest of honor at a dinner in an important city. The Mayor presided, and when coffee was being served the Mayor leaned over and touched Mr. Chamberlain, saying, "Shall we let the people enjoy themselves a little longer or had we better have your speech now?"

A young man who had been snubbed at the theatre door decided to get even with his girl friends.

The girls occupied the first four seats in the sixth row and the young man had the fifth. They paid no attention whatever to him. On the program was a monologist who began to talk of love to get a few laughs, as these artists often do. He said: "All the girls who are in love please stand up."