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VOL. I. P. 25

TORONTO, ONT., JANUARY 16, 1897.

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No. 1.

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Refer to page 24.

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Exploration has shown the Gold districts of the Province to be extensive and rich, and new finds are constantly being made. In the Western fields the ore is mainly free milling, and wood, water, and labor in abundance provide the requisites for economic working. The yield of gold for the year ending October 31, 1895, was \$50,281, and in the period from November 1, 1895, to September 20, 1896, it reached \$142,605.

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The fifth report of the Bureau of Mines contains a geological description and map of the new gold fields of the Rainy Lake and Seine river districts—free on application.

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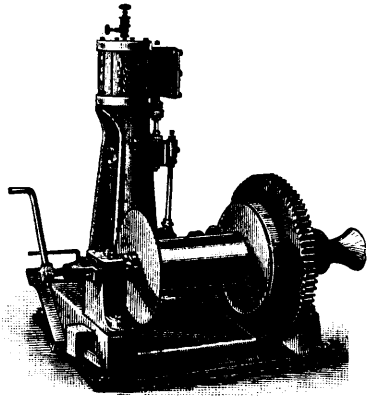
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Director Bureau of Mines, Toronto, Ont.

# The A. R. Williams Machinery Co. Ltd.

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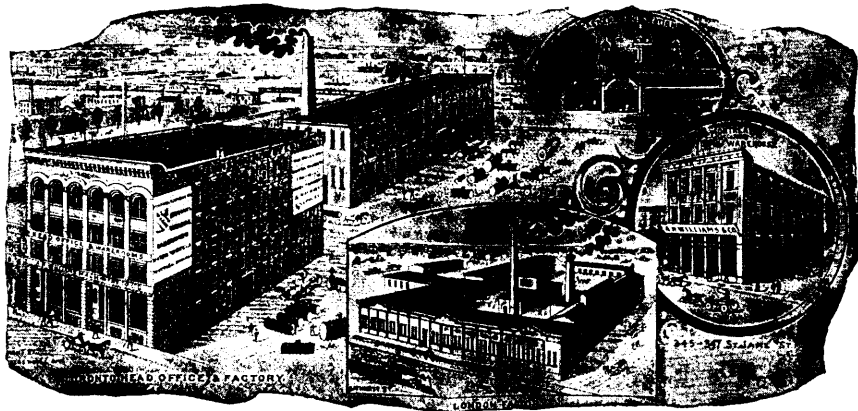
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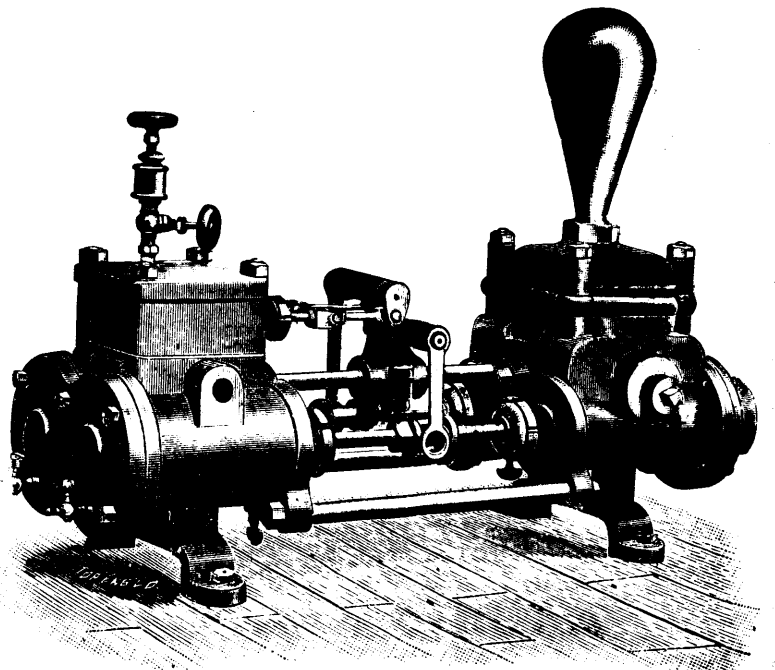
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# Mining Stocks and the Public.

Editorial in Rossland *Miner*, December 30, 1896 :

**“The best safeguard the public has is the character of the men who are at the Head of a Mining Company whose shares are offered for sale. When the public puts its money in a bank for safekeeping it looks to the men at the head of the bank. Character rises higher even than law itself in such matters.”**

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The Eastern Mining Syndicate is a **MUTUAL COMPANY**, conducted on sound and progressive, yet conservative, business principles. All of its stock is in the treasury as working capital.

It invites investigation of its methods and comparison of the personnel of its officers and directors.

Shares can be had for 20 cents until Wednesday, January 20th, on which date price will be advanced to 25 cents.

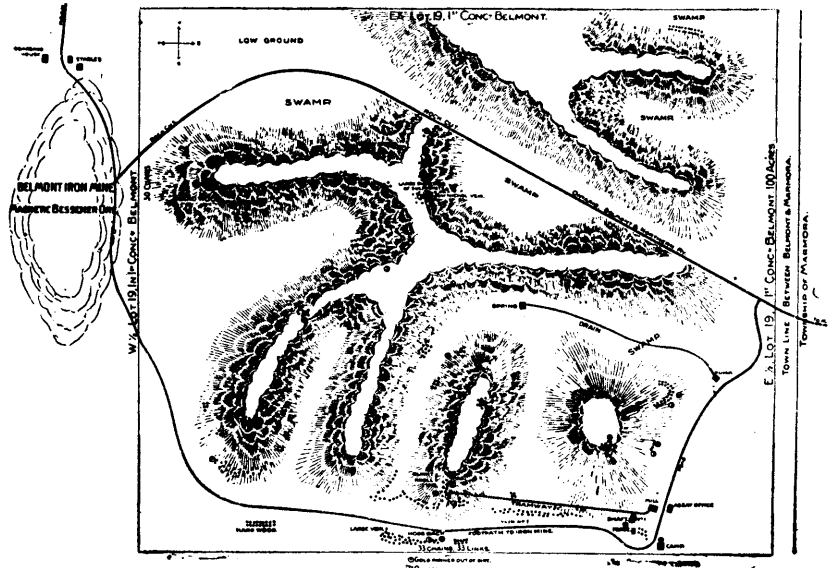
Apply for prospectus, and other information to

## The Eastern Mining Syndicate

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Plan showing the E 1-2 Lot 19, in 1st Con., Belmont Township, in the County of Peterboro', Ontario, Canada, the property of the Ledyard Gold Mines Co., Ltd.



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500,000 Shares in Treasury for Development Purposes.

The Promoters Shares (500,000) held in Trust till Nov., 1897.

The "HANSARD" is a MINING COMPANY, pure and simple, administered on rigid lines by business men and practical miners, who look for and can only obtain wealth by developing it from the rich mineral claims owned by this Company. Without doubt it is the best mining investment yet offered the public, who are not slow in showing their practical appreciation. Orders are flowing in from all parts of the Dominion and from the United States. Buy at once before advance. The chances are five to one. Price 10c. on five mineral claims is but as 2c. each per share. The "Lone Star," one of the Company's silver claims, is almost developed—four shifts of miners are pushing work night and day. Two tunnels are being run. The face of the eastern one is now rich in carbonates.

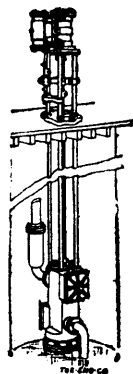
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### GOLD.

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TWO First-class Gold Mining Locations only a short distance east of Port Arthur, and near the C.P.R., will be sold at a sacrifice. Apply Box 13, Canadian Miner Office.

GOLD Mining Location, about 5 miles from Rossland, B.C., for sale. Terms moderate. Apply Box 9, Canadian Miner Office.

TWO Gold Properties for sale in Hastings Co., Ontario, free milling assays 24.40 per ton. Price moderate. Apply Box 14, Canadian Miner Office.

OWNER of half interest in a good Wahnapitae Gold Property, will sell out at a reasonable price. Apply Box 19, Canadian Miner Office.

DESIRABLE Mining Property for sale in McGregor Township, good report on same by F. Hille, M.E. For particulars apply Box 17, Canadian Miner Office.

FIRST-Class Gold Property near Shoal Lake for sale. Price moderate. Apply at once. Box 18, Canadian Miner Office.

DESIRABLE Gold Mining Location for sale near Heron Bay, on the C.P.R. For price and particulars write to Box 22, Canadian Miner Office.

TWO Gold Locations on Witch Bay, Lake of the Woods. Owners will sell either the whole or half interest. For report and price apply to Box 21, Canadian Miner Office.

GOOD Gold Mining Location for sale near the Scramble Mines. Good report. Only a few miles from Rat Portage. For price, etc., apply to Box 12, Canadian Miner Office.

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A WELL Developed Silver Mine for sale near Port Arthur, Ontario. Reports, etc., will be furnished to intending purchasers. Apply Box 6, Canadian Miner Office.

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A 1 IRON Location, 160 acres, for sale, near railway N.E. Ontario. Price reasonable. Apply Box 32, Canadian Miner Office.

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## Mining Laws of Ontario.

ANY person may explore Crown Lands for minerals.

Mining lands may be taken up as surveyed locations or staked claims.

Locations range from 40 to 320 acres. Claims range from 10 to 20 acres on vein or lode.

Locations may be acquired in fee or under leasehold.

Price of locations north of French River, \$2 to \$3 per acre, and south of it, \$2 to \$1.50, according to distance from railway.

Rent of locations first year 60c. to \$1 per acre, and subsequent years 15c. to 25c. per acre.

Rent of claims, \$1 per acre each year. Claims must be worked continuously.

Royalty on ores specified in the Act, 2 per cent. of value at pit's mouth less cost of labor and explosives.

Royalty not charged until seven years from date of patent or lease, nor (as provided in s. 4 (3) of the Mines Act, 1892), until fifteen years in the case of an original discovery of ore or mineral.

Original discoverer of ore or mineral on claim entitled to stake out a second claim.

Crown Lands sold under provisions of mining laws in force prior to 4th May, 1891, exempt from royalty.

Copies of the Mines Act, 1892, Amendment Act, 1894, may be had on application to

ARCHIBALD BLUE,

Director Bureau of Mines.

TORONTO, May, 25th, 1894.

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# The Canadian Miner.

VOL. I.

TORONTO, JANUARY 16, 1897.

No. 1.

## HOW GOLD MINES ARE MADE.

By Arthur Harvey.

"Surely there is a vein for the silver, and a place for the gold \* \* \* " Job 28, 1.

### I.—THE FORMING OF VEINS.

REND by earthquake, with noise and violence, the thick crust of the earth, drawn-tense by the slow but incessant contraction of a portion of its surface, and great fissures, miles in length, thousands of feet in depth, like those made a few years ago at Charleston, S.C., must result. Tumble into them, by the tremors which follow, fragments of the riven rocks, and the fissures cannot close. Now let the under-ground waters percolate through these newly opened drainage channels towards the unknown depths, and while the lime and quartz they hold in solution are deposited on the fissure walls, so that in time they fill up the chasm, any metals they also carry will be disseminated through the so formed vein; vapors from below possibly aiding in the work. On particles of iron or carbonaceous material these metals often crystallize, like taking to like, for reasons not yet fully known, and when the rift is thus completely filled with solid matters, Mother Earth has done her geological work, and given us a metalliferous fissure-vein. Of such there are thousands in the northern and western portions of Ontario, that whole region having been cracked, shaken and uplifted in ages past, severely and often.

Place upon the surface a sheet of ice, a mile in thickness, see it move like a viscous fluid, as the slopes permit and direct, towards the Mississippi, the Hudson Bay, or the lakes which now drain into the Atlantic, and the whole will be planed down by the awful friction, the hills rubbed into rounded knobs and the veins so exposed that on the vanishing of the ice cap they can be seen. Such a process has determined the superficial geographical features of our country.

### II.—THE FINDING OF VEINS.

One can scarcely row around a Muskoka lake, paddle from Lakes Huron and Superior up any river, or walk along the bed of a single brook in Algoma, without noticing either a vein or pieces of quartz called "float," which have been broken from it by natural causes and point the way to the vein from which they come. An explorer wishing for any given mineral, will of course, go to a region acknowledged to abound in it. Gold concerns us at this moment, and we will select for illustration of mining methods the New Ontario above alluded to. We might go east or north, instead of west, with fair chances of success, nor need we be confined to this one province, for all the provinces of Canada, with the exception of Prince Edward Island, contain workable veins of gold.

Our explorer must select weather when the ground is free from snow; his work can therefore only begin towards the end of May and must cease with October. He takes with him a sanguine temperament, a small axe, a light pick and hammer, a bag with biscuits, pork and a few potatoes, some tea, salt and tobacco, a frying pan, a tin pail and as many sundries as he can carry, rolling most things in his blanket. With these, the usual equipments of a flying camp, he makes for the woods, often

alone, sometimes with a friend or relative, in which case better preparations can be made for comfort. Every settler's shanty, occupied or abandoned, is known to the professional explorer, and often saves him the labor of making a shelter from the storm.

A sort of instinct seems to guide a practiced hand; he will observe every piece of float along the track, every little depression on the hillocks, often indicating where a vein may be covered up by the loose surface soil. Some explorers will find dozens of promising veins in a season; others get discouraged after weeks of fruitless search. There are no better explorers than the Indians, but few of them dare to reveal their knowledge, for the Great Spirit avenges by disease and death the disclosure of His secrets to the white interloper on the Red man's land.

A wandering restless life the true explorer leads—sometimes working like an ant while in the woods, too often spending his all and ruining his constitution in the town. He is generally truthful with those he trusts, but he is silent as an oyster or becomes a loquacious liar with the tenderfooted stranger. Think of him kindly, whoever reads these lines, and deal generously with him should the opportunity ever come. It is not he who absorbs claim after claim and holds for thousands what has cost the price of an old song; that place is left to the obstructive speculator, who sometimes befriends but usually plunders and swindles him when he is needy. An explorer of the genuine stamp is always ready to sell for little more than his expenditure and the fair value of his time; he wants to leave a pittance with his wife and children and be off to the woods again. He is the brother of the trapper and the hunter, the cousin of the Indian, and the prey of the country capitalist; he is the pioneer for the miner, and the guide, nay the very eyes, of the geologist. There are frauds among mining explorers, but not many; the salting of undeveloped veins is rare, while false specimens, if shewn, should not deceive even local experts. The best explorers sometimes retain an interest in their discoveries, and who have better rights to it, though the practice has its drawbacks, for, except upon fair conditions, it may hamper the application of capital which is needed in the next stages of development.

### III.—DEVELOPING A VEIN.

Having caught your hare, that is, bought a promising location, by option or otherwise, it is necessary to do some work, to prove it, and in mining, as in other legitimate forms of business, there is a very practical system of division of labor. In money centres, it would be useless to offer undeveloped veins. The technical terms are a little confusing, the explorer being often called a prospector, though he has nothing to do with the development that converts a surface shewing into a "prospect."

Near the surface the vein is generally much disorganized by air, water and frost, and the parts most suitable for work are often covered by detritus or some other form of capping. The first ten or twenty feet may thus offer few obstacles to the miner, and but few indications to the owner and assayer. One rich vein we have now in mind, near Rat Portage, was covered up by thirty feet of irregular fragments of boulders and broken rock, and the development

had to be carried on in faith, which was rewarded by striking a solid vein of ore eight feet in width, all of which assayed high. On the other hand, the Sultana was seen by the writer shewing twelve feet or more of solid quartz, that could plainly be noticed under the water which laved the celebrated island, and mounted clean, clear and broad up the face of the rocks which were on its shores. Work has in any case to be pushed "to the solid," where the minerals in the quartz are not oxidized, and the sides or "walls" of the vein can be clearly traced; its width can then be roughly estimated, and assays are in order.

As to width, there is no telling what is most promising. As excavations must be at least four feet wide, to allow room for work, there is a *prima facie* advantage if the vein is of at least that width, because then there is no waste rock to be removed; but small veins are often very rich and broad ones lean in comparison. In a broad vein, moreover, the gold often favors one wall, that towards which most drainage flows, and, near the surface, that must be the "hanging wall." The general preference is, however, for the broad vein, even of low grade ore.

As to assays, they must be carefully looked to: specimens fairly taken, and means adopted to obviate the unconscious prejudice which makes an interested owner pick up for assay the better pieces instead of the fair average. With a broad vein samples should be taken clear across it, and separately assayed, while even the "country rock" on each side should not be neglected. Assays being satisfactory, a mill test can now be obtained; that is, from five to fifty tons should be treated by a stamp mill, properly equipped, and honestly and cleverly managed. If this is satisfactory, shewing that in free gold and in the value of the concentrates (particles of mineral segregated after eliminating the gangue or rock matter) a fair margin is left for profit after the cost of mining and milling is allowed for, the preliminary development may be considered done, and the next stage may be prepared for.

The cost of this prospecting work depends on circumstances. In some cases, twenty feet may be enough to sink, in others a hundred may be needed. One shaft may suffice, but several may be required. The more that is done, the better, as a rule, for on a good vein every hundred dollars spent may return a thousand, in proved value. It costs about twenty dollars a foot to sink an exploring shaft, the drilling being done by hand labor or by hand drills, and a tedious operation it is. Men often work by night as well as by day shifts, only a few at a time in the confined space allowed them, contending with water if the mine is wet, with the poisonous gases from the dynamite, and with other foul airs. The "clink, clink" of the heavy hammers on the drills is monotonous, yet hope always cheers the workmen, and the excitement of anticipation as to what the next "shot" may reveal is pleasant. Every piece of rock broken from the floor of the shaft is intelligently scrutinized by anxious eyes. From one to two feet a day is the usual rate of progress towards the centre of the earth.

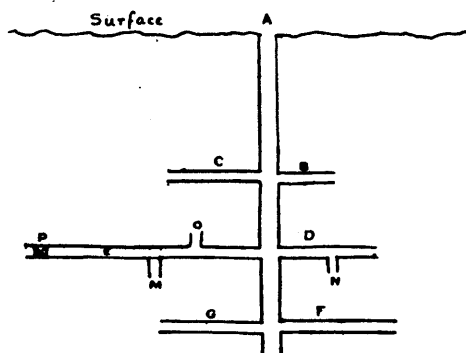
### IV.—MAKING A MINE.

As has been said, when the prospecting work is completed, risk begins to give way to cer-



tainty of profit or loss. From fifteen hundred to three thousand dollars have been spent in sinking a shaft into "the solid," and in providing a sleeping shanty and blacksmith's shop. The value of the vein in one or more parts of the location has been proved, and the heavier capitalist is invited to take up the enterprise. In a gold country, there is little trouble in finding purchasers at fair value for a good prospect: if the buyer cannot himself see the works, or judge of them, he can send an expert on whom he relies. Not that experts are infallible: the writer has known many adverse opinions that have led to the neglect of fortunes, but all does not depend on a single expert, and a fair value can in due time be had. The sale, too, is often made on "option." The mining engineer who is then placed in charge enlarges the preliminary shaft to the size needed for extensive work—say from five by seven feet, to eight by ten, divided in the centre to comply with the provincial regulations and for convenience of hoisting the ore and descending into the works, also for ventilation and safety. At about 100 feet, horizontal drifting is commenced, that is, tunnels are made on both sides of the shaft, along the vein. At the same time sinking is continued, and at 160 and 220 feet in depth, or thereabouts, other drifts begin. Each drift has a "breast," where men can work, so at 220 feet there may be three breasts on each side; six in all, and when these are driven from 50 to 100 feet, you have a mine. Assays have been going on all the time, so it is known if the ledge is uniformly rich, or rich in sections; if the latter, the direction and width of the rich streaks or "chutes" is clearly shewn, so that no lean ore need be taken out by stoping. If the shaft is 200 feet in depth, and the drifts 100 feet on each side, the development work will have cost \$10,000. If the ore is uniform in quality, and four feet wide, averaging say \$10 to the ton, of which \$8 is free milling, and \$1.50 can be had in concentrates, there is "in sight"  $200 \times 200 \times 4 = 160,000$  cubic feet, which at 12 feet to the ton = 13,333 tons. That will give \$106,664 in free gold and \$20,000 in concentrates, while between \$6,000 and \$7,000 will be lost in "tailings." The cost of mining and milling will be say \$2 per ton, or nearly \$27,000, so the value "in sight" and of the material on the surface means a certain profit of \$100,000.

This development having been completed, a mill can be safely put up. For such a mine, it should have twenty stamps at least, costing with tramways and necessary buildings for manager and men, perhaps \$25,000. It takes from four to six months to build a mill, which should never be done until enough ore can be continuously extracted to



A—Main shaft—100 feet to first level; 150 feet to second level; 200 feet to third level; 10 feet of sinking below that.  
 B—Drift at 100 foot level, 37 feet, 8 inches; north.  
 C—Drift at 100 foot level, 67 feet, 7 inches; south.  
 D—Drift at 150 foot level, 63 feet, 3 inches; north.  
 E—Drift at 150 foot level, 165 feet, 7 inches; south.  
 F—Drift at 200 foot level, 77 feet, north.  
 G—Drift at 200 foot level, 66 feet, 4 inches; south.  
 M, N—Winzes, 18 and 19 feet respectively.  
 O—Upraise, 21 feet.  
 P—Cross cut to another vein, 52 feet; 19 feet more to go to reach it.

keep it going night and day. This done, the expenditure on capital account may be stopped, and the dividends and sinking fund attended to. But, as Rudyard Kipling says, "that is another story."

#### PLAN OF A MINE.

From the published accounts of the work done in the Foley mine, in the Seine River country, district of Rainy Lake, to Dec. 1, 1896, we have prepared the subjoined plan. We do not know the owners and we have had no communication with them. We give this as an example of a very complete development; the mill will soon start, and it would seem that it cannot fail to be permanently successful.

### MINING IN BRITISH COLUMBIA

#### PAST, PRESENT AND FUTURE.

By W. Hamilton Merritt, F.G.S.

THE returns of the yields of the Cariboo gold fields, so far as obtainable, are clearly tabulated in Dr. Dawson's "Minerals of British Columbia," published some years ago. It is a very well-known fact in Canadian mining history that the Cariboo mines were the first opened in British Columbia. This was soon after the great gold rush into California.

Up to the present the placers of Cariboo have turned out nearly \$60,000,000 in gold, since their discovery.

The first discovery of gold in British Columbia was in the latter part of the fifties, and to-day there are "old-timers" living in the Province who came from California in '58 and who still are engaged in placer operations in the Cariboo district. Some of these men tell gruesome tales of their first experiences along the rapid Frazer, while trying to explore the interior. The Indians feared that they were about to lose their lands and determined to resist the encroachment of the first whites; therefore the miner did not know from behind which bush an arrow or a slug from an old Hudson Bay musket might reach him. I have seen a man who still to-day bears the mark of an arrow through his arm, and in whose breast-bone one can feel slugs that are still lodged there from combat with the Indians.

It is almost lost sight of that the miners were at first killed by the dozen, and that the Indians along the Frazer were not quieted until after a dozen bodies of whites, with those of a few Indians, were found one day in a little bay opposite Yale, having drifted from the interior. Then the miners took the law into their hands, obtained all the weapons possible and, marching up the stream to the Indian villages, slaughtered everyone in reach. The natives saw that resistance was useless, and peace was declared.

The old day mining in British Columbia was altogether confined to placers in the interior and to working, for local use, a small amount of coal on the Island of Vancouver. Most of the placer mining was deep working on the old beds of some of the more prolific creeks. It was not confined to the Cariboo district alone, but in many parts of the Province placer gold was worked with profit. The Cariboo, however, greatly exceeded the output of all the other districts.

The old time mining can still be seen in Cariboo, where as economical a system was carried on as can well be accomplished by the most advanced type of present-day machinery. The hoisting and pumping was accomplished by water power from a large over-shot wheel, the hoisting being by friction gear and the pumping by the old Cornish pump type. Everything was made of wood and manufactured by the miners themselves, on the spot. As examples of some of the yields obtained we could

note that four men took out 205 pounds of gold in twenty-four hours. One man said he was "shovelling gold." This was in Williams' Creek. On Lightning Creek 1,400 feet of the Van Winkle claim yielded over \$600,000, giving 70 to 100 ounces per set of timber (37½ square feet). Some 1,560 ounces were taken out of the claim in one week. In one claim alone, "Butcher Claim," one nugget of over \$500 was found.

Following the old-time placer excitement the next stage in British Columbia mining may be said to have been in the prospecting and partial development of quartz ledges, also in the Cariboo. This, owing to the lack of knowledge of how to utilize to the best advantage the refractory elements in the ore, was not successful.

Reference to Dr. Dawson's book, above mentioned, will show that the various discoveries of ore from time to time, exhibit a dispersion over a great extent of territory and an immense diversity. The coal development has been, up to the present, the most permanent of present-day mineral industries. This coal is situated on Vancouver Island and is the highest grade of coal that has been discovered on the Pacific coast. It has been managed by shrewd business men and sold for the highest possible price all along the coast, particularly in San Francisco, and the owners have reaped immense profits. The collieries turn out bituminous coal, which, however, has only been made into coke at the Union Colliery, situated to the north of the Nanaimo area.

The only high grade bituminous coal west of the Crow's Nest Pass, which has yet been found on the mainland, is situated in the Nicola Valley, where a five foot seam yields an excellent coking coal.

The real quartz and vein mining operations in British Columbia are of very recent date, and may roughly be said to have commenced in 1890.

As might naturally be expected they commenced from the boundary, if we omit the temporary development on the main line of the Canadian Pacific Railway, near Illecillewaet. The Montana prospectors and mine operators and smelters drifted over the border line into British Columbia, and, from their great experience in their own country, they were able to take hold of the undeveloped minerals in a serious business-like manner, which soon made a marked change in the situation.

The first discovery of great import, made in this manner, was that of the "Silver King," found by the Hall brothers while hunting for their horses. This mine is on a strong lode, carrying immense silver-copper ore bodies. The ore is carried by a wire directly to the company's smelter on Kootenay Lake. The mine was first developed by American capital, but an English company is now operating it, and its shares have considerably increased in value in the past year.

Miners and prospectors soon swarmed over the border line and located many silver-lead veins on the west side of Kootenay Lake, about Ainsworth. This slowly took them back to the Lardeau and finally to the still richer Slocan district, where ores are known in cases to run over 300 ounces in silver.

Free milling gold ores have been developed only to a small extent in the province, up to the present, in comparison to the silver ores, and more recently to the refractory gold ores.

Near the "Silver King" the "Poor Man" has been steadily operating for some years on a free milling vein. At Fair View, in the Okanagan, free milling veins of considerable strength have been worked, and, not far from there the "Cariboo," a mine at Camp McKinney, has

been paying dividends steadily from a ten stamp mill.

The aggregate of stamps dropping in British Columbia, however, does not equal that in the Province of Ontario.

The Rossland district, to the west of the Columbia, close to the border-line, has been of a somewhat more recent date, and there a cupiferous-pyrrhotite, identical in appearance to the Sudbury nickel-carrying ore, is found in places to have a large amount of gold associated with it. Extending west from Rossland the formation is of a copper-bearing character, and quartz copper veins carrying gold, and greenstones carrying copper ores are the prevailing ores of "Boundary Camp" and vicinity.

The chief development has been in a class of ore that requires smelting. At Trail the copper-gold smelter treats the Rossland ores. At Nelson a copper-silver smelter treats the "Silver King" ores, and on the Kootenay Lake a smelter has been operated until recently on silver-lead ores. From the Slocan most of the high grade ores are sent out of the country, as their richness permits them to pay the freight, and several concentrating plants, which dress out the refuse rock, are there located.

The present day operations in the Cariboo chiefly consist in modernizing the methods of gold working by using hydraulic jets or "giants" to wash the gravels which have gold distributed through them. In this work it is a well-known fact that the "Cariboo Mine" alone produced \$120,000 in gold during the past season.

In Cariboo also some of the deep workings are about to be drained by bed-rock tunnels, and virgin ground opened by this means. The gravels of the famous "Williams' Creek" ore will be raised and washed before long by the hydraulic lift system, and there is little doubt that large yields will be obtained there.

Quartz, also, in the Cariboo is receiving attention, and as the Cariboo schists are simply interlaced with irregular masses of quartz and quartz ledges, there is little doubt that some large quartz developments may there be looked for, especially when a railroad is built into the country.

On the Lower Frazer promises of remunerative dredging operations for gold on a large scale exist. On the coast and Texada Island excellent prospects for copper and gold are abundant. On Vancouver Island placer washings and refractory gold ores are said to be paying. And lastly, those developing the prospects in the East Kootenay say that the splendid silver-lead mine owned by Mann & Holt will be equalled by others of the same character, and by mines of free milling gold, copper and copper-gold ores, all found there.

With regard to the future it does not require a prophet nor the son of a prophet to forecast the inevitable.

Take a map, see the trend of the mountains from Mexico through New Mexico, California, Colorado, Nevada, Utah, Wyoming, Idaho and Montana into British Columbia where we have a length of the same mountain ranges equal to or greater than that already alluded to. Then turn to the statistics of the outputs of the above mentioned states, leaving out Mexico, and we will find that the silver, gold and copper output has been from a hundred and a quarter millions to a hundred and a half millions of dollars per annum. Look again at the geological map of the two countries, such as the Hitchcock map issued by the American Institution of Mining Engineers, and it will be seen that there is almost perfect geological similarity between the mountain areas in question.

The mineral development in British Columbia, in these mountain ranges, very naturally commenced in the south where it left off in

Montana, a state producing from 30 to 50 million dollars a year from her gold, silver and copper alone. The whole output of the Dominion of Canada has been from 10 to 20 millions of dollars a year, and arithmetic is hardly needed to see that an enormous gap exists which should legitimately be filled, when it is considered that the United States has been producing upwards of six hundred millions of dollars per annum from her minerals, and when the one adjacent state mentioned almost trebles our whole output.

To develop mines takes time and money: a very few of the located claims turn into a mine, and investors cannot use too much caution.

The experience in the United States, with their enormous production, has been great, not only in Montana but in northern Michigan and Minnesota, and when we begin to see Americans "sacrificing" their good things in Canada we can with good reason consider that these good things are worthy of the most careful investigation.

The aggregate of the development will be immense in the long run, but the losses of those who make investments on the recommendation of the vendors, will be very considerable. It is the very riskiest kind of "mining" that exists.

#### HURONIAN GOLD DISTRICTS.

*By John Gall, C.E., M.E.*

ALTHOUGH British Columbia has decidedly set the pace for Canadian mining, Ontario is coming to the front rapidly, as her gold fields are now being practically demonstrated to be of great value and of immense proportions, extending throughout central Canada, and easily accessible, in many cases, by boat and rail. The discoveries made, and the work of development which have been done have raised great expectations as to the mineral resources of Ontario. Although Canada can boast of a few prosperous and dividend-paying mines, the New Ontario will in a few years' time add many more to the list of productive gold properties.

The Lake of the Woods and Seine River district has largely monopolized public attention of late, because of the rapid progress of active prospecting, coupled with substantial and proper development work, while in addition stamp mills have been pounding away and producing gold bullion with exceptional regularity, as is the case, by way of example, at the Sultana mine near Rat Portage.

There are now many fully developed properties, and the conclusion reached by practical experts is that there are vast ore bodies of good grade gold bearing quartz of a free milling character in the Huronian rock sections of Ontario. The quartz veins in this Huronian strata differ somewhat in each section. For example, in the western section of Ontario the veins are easily determined at or near the surface as well defined and true fissures running through the volcanic rock formation, as also in contact with protrusions of eruptive rock. The result of the glacial period has been to expose these fissure veins, and we find their dip not deviating far from the vertical. It is quite a common thing in the Lake of the Woods district to trace mineralized gold bearing fissure veins for several miles in a straight course. One striking instance of this is Bath Island which has numerous true fissure veins running through and across the formation the entire length of the island and into the lake over two miles, and traceable beyond to the other islands lying a considerable distance to the west.

In other districts equally promising, the veins on the surface are more numerous and are interstratified in the Huronian rock formation,

dipping and converging together into main fissures.

The most notable example of this is to be found in some portions of the northern extension of the great Huronian belt, north of and beyond Lake Wahnapiæ, a district lately visited by the writer, and which, although still unexplored, gives the greatest promise.

The fine character of the ore at the Crystal mine, immediately north of Wahnapiæ Lake, and the showing from partially developed properties on Lake Kokogaming, near by, prove the ore to be very high grade and likely to yield a large percentage of gold by the simple and inexpensive process of free milling.

There has been little or no deep mining done in this region, and consequently, no very large ore bodies have been yet developed, although every indication points to the existence of valuable fissures when the proper depth is attained, which of course, means an expenditure of considerable time and money.

As part of this region is still covered with valuable pine timber, the problem of harmonizing the two interests of lumbering and mining has still to be solved in a way satisfactory to the general interests of the people. When this is done no doubt prospecting and mining will proceed. In the meantime the Provincial Government refuses to grant titles to mining claims.

The region east and north of Wahnapiæ when opened up will be central and most convenient for mining, as the roads from the main line of the C.P.R. to the navigable lakes and waterways are in fair condition and not long, but although the country is favorable in this and other respects for mining, the difficulty of penetrating and extending operations far into the interior of a forest reserved by government as timber limits has yet to be solved.

#### THE NEW-OLD BOTHWELL OIL FIELD.

A LITTLE more than thirty years ago the town of Bothwell in Kent county was known far and wide as the centre of a rich oil field. The existence of petroleum springs along the banks of the Thames river, which separates the townships of Orford and Zone, was well-known to the settlers of fifty years ago, who gave to it the name of River Oil. But in those days it does not seem to have occurred to any one that it was present in large quantity, or that it possessed an economic value. The Indians gathered it with their blankets and used it as a healing nostrum, and by some white people it was regarded as a specific for many ailments. Not until the great petroleum fields of Pennsylvania began to be explored, and a process was discovered for refining the crude oil and producing a light-giving oil, did any one regard with favor the show on the Thames; and then when one or two lucky strikes had been made, there was a rush to the district such as is only paralleled when a new gold field has been discovered. In those days, however, little was known as to how petroleum occurs in the rocks, and although some things are yet to be learned, it is certain that the pioneers in Bothwell made grave mistakes.

Careful study of boring records in Pennsylvania and Ohio has demonstrated at least two things. One is that the reservoir of petroleum is a porous rock of some kind, either a sandstone or conglomerate or a dolomitic limestone, which holds the oil as a sponge holds water. The other is that gas and a salt or bitter water are invariably present with the oil, and that the three substances are arranged in the order of their specific gravity—gas uppermost, and oil between the gas and the water—and when the reservoir is tapped with a drill there is an up-

flow just as happens when an artesian well is bored, the force and continuity of which depend upon the pressure behind. Another thing which appears to be demonstrated in some fields is that an uplift or arch of the rock is a necessary condition of a reservoir; and in fields where there is no indication of an uplift as shown by the borings, a dip or incline of the rock appears to be a necessity. So good an authority as Prof. Lesley scouts the arch or anticlinal theory, and in one of his reports he goes so far as to say that the "popular notion that petroleum wells are dependent upon anticlinals, faults, or other disturbances, is a pure fancy of the imagination. Yet it has been conclusively shown by Orton and others, at least in Ohio, that every occurrence of gas and oil is in an anticlinal fold or uplift; and even in Pennsylvania the records of borings go to show that the best producing wells are in regions in which the sand rock has a sensible dip, in some cases as much as twenty feet to the mile. A serious rock disturbance, resulting in fracture or faulting would no doubt lead to the escape of oil or gas which may have been previously stored up; but between such a disturbance and one which produced only a moderate uplift or arch without fracture, there is wide difference. An arched rock or a rock having a long dip is certainly favorable to the storing of gas and oil, especially when it is overlaid by a thick bed of shale or other impervious covering; and these conditions appear to exist in some form in every oil-producing district where careful records of borings have been kept.

Thirty years ago, however, oil-well drillers went on the Cornish miners' theory of the occurrence of gold, viz., "where it is, there it is," and borings were made regardless of any horizons, or inclines, or arches. In the Bothwell field this was notably the case, and hundreds of wells were bored in barren ground which did not give a sign of oil, but which gave the bitter water abundantly. Even in the producing field many wells were sunk down through the oil rocks into the salt water bed. In many cases this probably happened because the driller had a good contract of a rate per foot, and there are said to be instances of the oil flow being cased off so that the drilling might go on. A serious consequence of this practice was the flooding of the oil-bearing rock with salt water, which imposed an enormous labor and cost of pumping before the oil, that had been driven back by the pressure, could re-enter the well. Particularly was this the case when the pumps had been idle over the Sunday, and old operators remember that it took from one to three days, according to the situation of a well, before the regular maximum flow of oil had been regained. And, at last, when the Fenian invasion of 1866 led many American operators to flee the country, and most of the wells were left idle, the whole territory became flooded, and before operations were resumed the great strikes of oil in the Petrolea field caused such a slump in price that no owner of a well on the Thames river would dream of starting his pumps again.

But in Petrolea, now, the average daily production of the wells is less than one barrel per day, and the improved market of last year led some enterprising men to re-prospect the Bothwell field. They were successful: a few wells were bored which have yielded twenty to fifty barrels per day; and a careful study of records has shown the existence of a clearly defined arch of oil-bearing rock within the limits of which producing wells may be got at any point. The course of this arch appears to be about due east and west, and while its width is only about half-a-mile, its length is at least five miles, and it may be much more.

The modern driller, too, knows that he must avoid tapping the salt water, and if by mistake he chances to do so he knows that self-interest requires him as speedily as possible to stop the flow. Experience has taught him, too, that there may be one or more parallel uplifts or reservoirs of oil, and he will be encouraged to thoroughly explore the region. An article so valuable as petroleum, yielding so many products useful in the arts, is worth prospecting for, and much has already been gained by prospecting intelligently.

#### SOMETHING ABOUT ROSSLAND.

PERHAPS most of those who invest in Rossland mines have but a very vague idea of where the famous gold field which originated the town is situated. We therefore give with some abbreviation, a few details about Rossland, from a recent issue of the *Rossland Daily Record*. The *Record* says:

Rossland is situated in British Columbia, eight miles from the international boundary line between Canada and the United States. It is reached from the north via the Canadian Pacific Railway to Arrowhead, on the Columbia River, from there to Trail by steamer and from Trail to Rossland by the Columbia and Western Railway; and from the south, via Spokane, Washington, by the Spokane Falls and Northern to Northport, and from there to Trail by steamer.

Rossland has thirty hotels, with bars, eating and lodging-rooms, and half a dozen restaurants; and all are well patronized.

There are four weekly newspapers and one daily—the *Record*. All other branches of business are well represented. The population is variously estimated at from 5,000 to 6,000.

Board and lodging at the hotels, \$2 to \$3 per day. Meals, twenty-five and fifty cents. Furnished rooms, \$3.50 to \$7 per week.

While there is not work for all who enquire, most sober, industrious persons who really wish to work have, so far, been able to obtain it.

We would not advise any man to land here "broke," without friends, although many who have done so are doing well.

The populace is engaged not only in working the mines and conducting the business of the town, but are buying, or bonding, or developing mining property; buying and selling real estate; building houses for rental purposes; prospecting and staking prospectors. Many are here simply looking on in wonderment. We believe it will go on and on until Rossland can boast a population of 50,000. After that it will probably settle down to the proposition of a pay roll, but not for four or five years.

There are millions of money from all sections of the globe, but the principal investors are from the United States, with Canada largely interested.

The town has an enviable reputation for law and order. It is supplied with water works and electric lights. The main street is graded, and ten blocks are built up with two and three-story business houses.

**The Canadian Miner has the largest circulation of any mining paper in Canada, and it reaches miners and investors with unequalled directness and completeness.**

Analytical chemists, mining engineers, practical mining men, blacksmiths, carpenters and all others useful around a mine, can by using our advertising columns, reach directly the managers of Canadian mines. Two cents per word is the cost of advertising for positions. Four consecutive figures or less are counted as one word.

#### PARRY SOUND MINING.

PARRY SOUND district is looming up as a mining country. It has been generally supposed to be Laurentian, but experts find appearances that suggest that Huronian rocks occupy at least portions of the district. Gold, it is said, is found on the Robert Leaks property. The McGown property, which has for some time been known to show good indications, has been taken over by a company organized at the court house in Parry Sound the other day, with Judge McCurry as president, Capt. Macfarlane as secretary, and Wm. Beattie, and other well-known Parry Sound citizens, as stockholders. The company is known as the McGown Gold Mining Company. The McGown property is about two miles east of the town. It is the intention of the company to take out the ore and see if the Ontario Government would not put in a plant at Toronto for separating the metal, or, to consider if it would be advisable to put in a plant at Parry Sound, which would be sufficient to deal with the large mineral deposits in this and other mines in the district.

John Gardiner is reported to have found gold in the rocks behind Gibraltar, on Mill Lake, about a mile and a half north of Parry Sound. The quartz contains gold and copper, and there is also iron on the ridge. Mica, some of it of good quality, is also one of the products of the district. Around Waubanick, in Ferguson township, Henry Harris has for some time been mining this mineral and, it is said, with considerable profit. The Land property, too, is said to yield mica.

The Valentine Mica Mining Company, of Toronto, says the *North Star*, of Parry Sound, has purchased an interest in the Boyne River gold mine, owned by Joseph Dwyer and Frank Lafex. The company will commence operations about June 1st.

J. O'Neil, Sudbury, commenced operations on Thos. Wilcox's gold mine at Canoe Lake, in Parry Sound, about the middle of December.

#### A GREAT MINE OF GRAPHITE.

THE Ontario Graphite Company, of Ottawa, have just completed their works for treating graphite ore and expect to commence operations early this year. The company's mine is situated on the south side of White Fish Lake, in the township of Brougham, Renfrew county, and about twenty-five miles south of the town of Renfrew. The vein extends under the lake north-eastward, and has a width of twenty to twenty-five feet. South-westward it has been explored for a distance of about 1,500 feet by pits in the drift, but its length is not yet known. It is, however, one of the largest deposits in the world, and the quality is excellent, much of it running from sixty to eighty per cent. The vein occurs in crystalline limestone and the walls are clearly defined. Samples of the ore sent to Germany have been made up into lead pencils, which are pronounced fully equal to the best made from Bohemian graphite. It is the intention of the company to produce three or four brands, including flake graphite for crucibles and the powdered for stove polish and pencil stock. The plant has been constructed under the direction of Mr. Cirkel, a graduate of one of the German mining schools, and it embraces the best features of the largest mill plants in Germany.

**The Canadian Miner will help you to make money. A showing is made of the mining industries of the country every week, and the really important mining events recorded, rather than the unimportant, or rumors circulated for selfish purposes.**

# The Canadian Miner.

ISSUED ONCE A WEEK

AND

Devoted to the interests of Miners, and all kinds of Mining; to the popularizing of Mining as a great National Industry; and to the protection of investors in Mining Companies.

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WE.

We simply make our bow to the public. We are needed.

We will be needed more after a few months.

It is not necessary to state why we are here.

We are here to stay.

Our circulation, from the issue of this number, will be large, and will reach the leading investors of the country, and our leading miners, and in fact, nearly all who are interested, through management of mines or through investment, in our mining industry. We will endeavor to reach mining men in Great Britain and the United States, as well as in Canada.

THE CANADIAN MINER is not a rival to any mining journals already in the field. We have comparative few of such. And of the few a number have been doing good work. They have their fields: we have ours. The respective fields may overlap a little, but there is no real conflict of interest. In truth, it is the other way. To many, and as the mining industry grows, to many more, it will be necessary to read the mining journals that give special attention to mining from a scientific point of view and to those that find their scope in general practical suggestions and aid to investors and to the broad public whose interest in mining is indirect.

The present is a very important stage in the development of one of the three greatest of our national industries. Never before has there been such promise in mineral development as there is at the present moment. It is not a temporary excitement that exists. The interest everywhere exhibited is but the prelude to a widely spread and permanent establishment of a great national industry. Gold and silver mining will, no doubt, be, for the future, sources of great wealth to the Dominion. Nickel and other mining will, in their wake, receive due attention from our people.

We are distinctly hopeful, yes, confident of an early and immense development of the Dominion in precious metals, and somewhat hopeful about the future of others of our minerals. We will not throw cold water on reasonable warmth of expectation, but will encourage efforts to realize the opportunities on every hand to make money out of our rocks.

But we wish for no "boom." Booms are nearly always disastrous apparently—at least temporarily—to the real interests of the individuals who make up the community. We set our face determinedly against "wild cat" speculation, and will endeavor to help the quiet investor

and to guard the mining interest and the country's credit against the injurious effect of ill-founded speculations.

By circulating information regarding the enormous mineral wealth of our country, a wealth only now beginning to be appreciated by our people,—we hope to enlist in our mineral development the service of the capital of other countries, as well as a fair proportion of the capital of our own country, which has so many other important prospects looming up. With this view we are securing the services of trustworthy correspondents in the mining regions—actual and prospective—of the whole Dominion, from the Yukon country and the Pacific, east to the Bras D'Or. We shall endeavor to give practical hints to miners, and trustworthy information to investors. We shall, from time to time, furnish from the pens of experts scientific articles of popular interest and sometimes of special interest to practical miners. On the whole, THE MINER will be a popular mining journal, adapted to all who take a broad interest in mining, and valuable to the many who have neither leisure nor opportunity to secure the many daily and weekly papers which give attention to mining news.

We appear modestly. We intend to preserve modesty. But we intend, as the difficulty is surmounted of securing trustworthy information—a difficulty which accompanies the inauguration of a journal dealing specially with an industry in which there are so many conflicting interests involved—to enlarge and improve the journal as opportunity offers.

In the meantime we ask our friends, and all interested in mining, to send us any item of news they believe of interest to the public.

## PROPOSED CHANGES IN MINING LAWS.

THE mining laws of the Province of Ontario, it is generally supposed, are to receive at the approaching session of the provincial legislature a good deal of reconsideration, and perhaps some important alterations. The present Act has met with no ardent support, but, among mining men generally it has been more or less strongly condemned, and to certain of its provisions many have ascribed the lack of enterprise, and of native and foreign investment which marked in a singular measure the history of our mining industry from 1891, when the royalty clauses of the Act were inserted, down to within the past twelve months of great interest in the gold discoveries and developments. Even on the present activity in gold mining, these clauses are said to have been retarding in their effect. Had the fear of the royalties being actually imposed been removed, the investment in Ontario mines would have been much larger than it is. The royalty clauses and several other provisions of the law are objected to, and the objections made, we have no doubt, will be weighed by the Government, in an endeavor to make the Act satisfactory to all directly interested in mining, as well as to the general community.

Ontario has, too much, been regarded as essentially an agricultural country, and the hundreds of miles of rich unbroken stretches of farm, orchard, or vineyard, have confirmed, in most minds, the truth of this conception. But just north of this belt of well-populated and fertile southern country begins a territory, which is partially discovered to be, over its twelve hundred miles of reach east and west through Ontario, sprinkled and belted with large and small areas immensely rich in the precious metals, to say nothing of such metals as nickel, copper and iron. The original belt of frontier farming land was settled by people who knew nothing of mines, nor was there much in their new surroundings to suggest

that there were immense mineral resources at their doors.

It is principally with the opening of the great mineral and lumbering lands to the northward that the discovery and present development of our mining has been connected. At the heels of the lumberman came the pioneer to derive from the broken areas of fertile land, scattered through this ribbed and torn region of jagged, many-armed and beautiful lakes and streams, a living by supplying the woodman's camps. Rich minerals were not thought of, but glacier-swept rocks standing up everywhere could not long prevent suspicion that there was something perhaps more valuable than farm products, or even mighty trees, to be reaped from the earth. The day of prospecting dawned. It is now early morning over a fringe of the wilderness.

Compared with the five or six hundred miles of rich border-land to the south and west, a border-land in some places narrowing to a score or two of miles in width, the width of this mineral land is great, rarely being less than 200 miles, and being at most about 500 miles from north to south. In territory alone, to say nothing of the immense wealth of precious and other metals buried beneath the scanty soil, this great northern and north-western area well merits the title given it of *Great Ontario*.

Then beyond this, in the far north, 700 miles from the southern extremity of the Province, we again reach the same rock formations as exist in south-western Ontario, and petroleum, so important a product to the south-west, as well as coal may yet be found.

Geological maps mark areas (away across the "divide" or height of land separating the waters of the St. Lawrence and great lakes from those of the Hudson Bay) of the same gold and silver-bearing rocks, which in the Sudbury, Lake Superior, Seine River, and Lake of the Woods districts are already known to be immensely rich. As yet the country beyond the "divide" is an unbroken wilderness; no prospector has entered it, and exceedingly few have been the scientific men who have traversed its rivers, and noted here and there the outcroppings upon their banks.

So much, however, is known, of the very imperfectly explored Huronian or Keewatin districts that embrace tens of thousands of square miles of our northern wilderness, to justify the greatest interest on the part of our people in the mineral development of the province, and the utmost care on the part of our Government to devise mining laws fully adapted to secure that development at the earliest possible time. It may be that the mineral regions referred to will sustain directly and indirectly within their confines as large a population as that now depending upon agriculture. A million souls might not be an over estimate of the population of Northern and North-Western Ontario within an early date, if the promises so richly indicated are fulfilled. This population would form a most important market for our farmers and fruit growers, and for the output of our manufactories.

To develop the territory requires a liberal policy—as liberal as that which has been extended to the farmers, and perhaps even more so, considering all the circumstances.

The prospector should be encouraged in every way possible, and as the co-operation of capital in joint stock companies is required, their cheap and speedy organization should be facilitated. Some of the companies operating in British Columbia secure their charters for less than \$10. Where small capital is required by a company to secure fair developmental work, with a view to creating a real mine, the matter of even the small outlay on a charter is of moment. In England charters have been obtained

within a few days after application. Here the process usually requires five or more weeks, a time which in regard to mining companies many think appears to answer no public purpose. Our mining laws, it should be remembered, are naturally of comparatively recent origin.

The year 1891 might perhaps be said to be the earliest date to which we in Ontario can refer as showing a distinct appreciation of the mineral wealth of the province, and then that appreciation was confined to comparatively few. If our laws are defective, it is natural that they should be. We have had to borrow hints from other lands and attempt to adapt foreign regulations to our special circumstances—by no means an easy task.

One of the greatest hindrances to enterprise in mining has been the impending royalty—a provincial tax to be levied by percentage on the products of the mine. It was provided for in 1891, but owing to the outcry made by miners and prospective miners its operation has been delayed. But the clause is there and the time limit for exemption soon expires. There are many who contend that products of the mines should not be taxed any more than products of the soil. The matter is probably one largely of public expediency, not of principle. We tax malt, a product of the soil, and beer and whiskey, likewise products of the soil, and not involving anything like as difficult processes, or as much risk of failure, as the production of gold, silver and nickel. Many nations have for centuries reserved the right to all or to many minerals under ground, and reserve a right to tax the products taken out of the mines. The Government of Ontario is therefore clearly within the common rule in imposing royalties. Whether the tax is expedient, or the form in which it is levied, the best, is another matter.

But there is no question that the royalty is unpopular amongst the mining men. Capital is timid, especially in regard to new mining fields, and our mining men well have learned that amongst other things the threatened royalty has had a deterrent effect on native and foreign capitalists contemplating investment in our mines. This has been especially true in regard to nickel, a metal rising in demand, for it can be used for very many purposes, but no purchases of nickel locations were made after the time in 1891 that the Government decided on a royalty.

We would suggest for consideration, in case the Government be determined to exact a tax on mine products, that instead of a royalty, a tax be levied on the net income of each mine beyond a reasonable interest to investors on the true capital of the mine. In view of the fact that very many mines are exhausted, so far as profitable working is concerned, in ten or twelve years, ten per cent beyond the cost of working and reasonable expenditure on plant might be allowed. The tax should be levied at, say, one mill on every one per cent. over and above the ten per cent. exemption.

The plan would be advantageous in many ways.

It would not burden inadequately-paying or non-paying concerns.

It would exact a rich return, without evasions, on well paying concerns.

It would then not prove a bug-bear to investors.

It would, by encouraging mining, tend to open a number of mines which otherwise would not be opened, and secure a large income from mining than the province is likely to receive under the royalty clause.

By placing very heavily paying companies, which secured their patents previous to enactment of the royalty clauses, under tax, it would receive from them, what is impossible now, a

proper share of the produce of their mines, and would do so on well recognized principles.

Furthermore, by giving the Government a right of inspection of the books of every individual, syndicate or company operating a mine, it would protect and give increased confidence to investors. It would, too, furnish data for intelligent investment of capital in our own mines, and for guiding the Government in legislation on many matters.

Every mine should make reports to the Government, say every six months, showing the output of the mine, the working expenses, and wear and tear of machinery.

We make this suggestion in regard to royalties with a view to its discussion by the public, for there seems much reason to hope that this plan, which is already known in municipal affairs, might do equally well in state government.

#### RUMORS AS TO LEGISLATION.

THE rumors afloat as to what policy on mines the Ontario Government will announce, are very various, but in regard to some matters substantially agree. But then, we know, that outsiders sometimes know more about the deliberations of a Cabinet than the Cabinet does. But between rumors and rumors, it looks as if important changes in the law are impending. We hope that any requirements, such as, perhaps, the having of a real mine before a chartered company can form, will take into account the interests not of wealthy men only, but of prospectors and their friends, who on little development may struggle to retain in their own hands a vein that promises much, and upon which, though untested, they are ready to risk their time and money. The law should be particularly careful of the poor miner; he needs it much more than the rich one. It is suggested that Government experts report on every mine for the operation of which any company applies for a charter. The report would tend to discourage "wild cats" and foolish schemes, in which careless men often invest because some men reputed for carefulness have apparently endorsed them by subscribing for stock. But perhaps the action of Government in inspecting might be too slow for the present development of mining in this country. And besides men have a legal right to invest carelessly. When they do it, it is a practical lesson. Some learn not to do it, after they have had experience. Some don't. It is largely a matter of individual right, rather than of public concern. But Government reports, all the same, made either prior to or after incorporation, would tend to stop foolish exploits that may, in the present incipient development of the enormous mineral wealth of Canada, retard full development.

#### SPEEDY INCORPORATION.

THE requirement of some time to elapse between the application for and the granting of charters to joint stock companies has in some instances a good deal in its favor. But in regard to most businesses carried on by companies, the requirement of four week's notice in the official GAZETTE seems wholly unnecessary. This is true, distinctly, in regard to miners' companies. If a name chosen be that of another company—the danger is easily avoided—reference to a list of companies would in a few minutes decide whether the name chosen by a new company should stand or be altered. Organizers almost invariably take care not to adopt names that require alteration afterwards or make them subject to legal penalties. So with most details of organization. And the general law is there, and is supposed to provide a remedy for every illegal act or intrenchment

on the rights of others. Why should not Ontario adopt the simple plan of the Imperial Act, which allows a company to organize and secure its charter within a few days. The filing of papers declarative of association for mining purposes is, with a few precautions, all that is necessary. The cost, too, of present charters could be greatly reduced.

#### FOREIGN CHARTERS.

THE matter of provincial versus foreign charters, in operating mines in Ontario, is likely to be a subject of considerable discussion. Many say that Ontario charters are not as liberal as they ought to be, but nearly all the substantial complaints appear to be as to the time and money expended in getting them. The best charters in British Columbia and the Pacific States are not more liberal. As to some other charters, it would be difficult to describe them. But so far as Ontario, or Canada in general, is concerned, certain powers conferred that might be operative in the States or countries in which they are granted, might be made inoperative here, in case these powers conflicted with justice, or the public policy which, of course, though it is not always considered in public opinion or in legislation, should be founded upon justice between man and man, and liberty to do what one chooses to do, wisely or foolishly, so long as justice is not interfered with. Perhaps we cannot prevent foreign charters; perhaps we can; perhaps it were better not to prevent them. Perhaps self interest in the long run will find a solution of the question, apart from legislation. There are high legal authorities in New York City who aver that companies formed under West Virginia charters could never float in either London or New York. New Jersey charters are better, but the Ontario Gold Mines Co., of New Jersey, deemed it wise to secure Canadian authority by amalgamating with the Foley Mine Company. We have, however, the right to ask full reports from all companies, to tax them equitably, and to require all companies to conform to our mining laws. Our own law in regard to chartering companies, should be made as liberal as is consistent with just policy.

#### MINING RISKS COMPARED.

SOME people think that an investment in gold mines is of the nature of gambling. The opinion is a mistaken one. If an investor takes care to see that the mine he invests in is properly equipped in capital, is managed by practical men, directed by really trustworthy people and shows sufficient development to ascertain that it probably will prove a real mine, he takes no more of a risk than in engaging in a drygoods, grocery or hardware business. The late Hon. John Macdonald, one of Toronto's most successful wholesale merchants, some years ago stated that after a twenty years acquaintance with the careers of men engaging in commercial life, he had found that sixty per cent. lost all or most all of the money they put into business; that thirty-five per cent. got out barely holding their own, or making but little, and that only five per cent. actually made money. Talk about risks! Gold mining, especially when undertaken with moderate care, does not present the risks of ordinary business enterprises.

For filling vacant situations (where skilled labor is required) in mines, the Canadian Miner is the best medium in Canada.

Send \$2.00 for a year of the Canadian Miner, published weekly, or send proportionately for a shorter term, not less than six months.

## WHY SO LONG UNKNOWN?

FOREIGNERS who hear of the existence of rich gold fields in Ontario are often a little incredulous. They ask—If you have had those riches at your very doors so long, how is it that only now they have been discovered?

A satisfactory answer can easily be given.

Population in the province has been almost entirely confined to the fertile alluvial lands bordering on the St. Lawrence, and Lakes Ontario, Erie and Huron: beyond these Silurian and Devonian areas, where rock outcroppings are in some districts not seen in fifty or a hundred miles, stretches a wilderness of forest clad Laurentians, where so far as was known till recently, only small patches of arable land could be found. Only lumbermen and a few others penetrated these wilds. The rocks were apparently barren, so far as the most valuable metals were concerned. But with the pushing northward of settlers, and especially the building of railways, the country became better known. Scientific men, too, began to distinguish between Laurentians and Laurentians. Large patches and belts of the Laurentians were found to be different from the general characteristic rock which marks that well known formation. And here and there in this different rock, to which the name Huronian was now given, gold and silver were found. Finally interest in mining became aroused, and of late rich veins have been found in many areas over almost the entire stretch of the Laurentians, from near the Ottawa in the east to the Lake of the Woods in the west. The development of a few paying mines last year made the interest general; prospectors went out by the hundreds, and have been rewarded by abundant discoveries of fissures containing the precious metal.

Had the people of our frontier counties been acquainted with mining, it is likely that, long before now, the fact of our having so much mineral wealth would have been realized. But agriculture and lumbering had been the engrossing main industries of the country and the basis on which our manufacturing and commercial concerns stood. When our farms, our towns and villages sent their young men to college, it was to make them lawyers, doctors or clergymen. The study of mineralogy received but scant attention—just about as little as was consistent with the securing of what is called a liberal education. It is only within a few years that instruction in mining has been given, and already we are receiving beneficial results in the existence amongst us of mining engineers graduated from our schools of practical science. The more young men who talk mining and geology in their homes and in their communities, the more interest, and intelligent interest, will be taken by our people in developing our great mineral resources.

## FARMING NEAR MINING CAMPS.

THE wilderness of rock and forest that covers the distance of three hundred miles between Port Arthur, on Lake Superior, and Rat Portage, on the Lake of the Woods, is not altogether given up to the lumberman and miner. The rivers and lakes have been traversed by canoe, and their outlines traced, here and there, with approximation to accuracy, and here and there only vaguely. A few lines have been traversed over land by the surveyor, and in the extreme south, along Rainy River, townships have been surveyed. But the country is yet unknown; considerable areas in every part have never known the white man's foot. But probably almost everywhere are belts and pieces of land of limited area suitable for farming—that kind of farming which is not in competition with the true ag-

ricultural lands of the country, but which, through neighborhood to mining and lumbering camps, is more profitable for the time than the farming of the prairies. Apart from these small broken areas, there are, however, some known districts of considerable extent. On the Canadian side of Rainy River, for instance, there stretches for eighty miles, in unbroken fertility, a well-forested belt from ten to twenty miles deep, a belt of land said to be unsurpassed in fertility by any similar area in the Province. The climate, as in all the central portions of this continent in similar latitudes, is very severe in winter, but genial and warm in summer, and, owing to the large extent of lake and river, autumnal frosts are later in occurrence than in Manitoba and Minnesota. Here Indian corn, wheat and other cereals flourish, and notwithstanding the cold of winter, the apple has been known to succeed, sheltered as it is by the forest. Already the district has 7,000 white settlers.

Then, amongst the other agricultural tracts of considerable area, there is the surveyed tract at Lake Wabigoon, eighty miles east of Rat Portage and traversed by the Canadian Pacific Railway. There are two townships surveyed. The soil is chiefly clay and clay loam. Instead of abrupt ridges, with narrow conlees and swamps between, we have gently undulating hills. The surface is not clad with forest, but is almost ready for the plough. This region the Hon. Jno. Dryden, Minister of Agriculture for the Province, thinks so much of that he has established in it a pioneer farm, which is doing well. So, on the heels of the miner or lumberman, or preceding them, many a farmer's son may safely establish himself in the wilderness.

## A BUSY SUMMER.

ACTIVITY in mining, such as never before has been witnessed in Ontario, will mark the opening of the spring. The signs are numerous. In the latter part of the summer, applications to the Crown Lands Department for patents of mineral lands began to come in freely. In November the number was about 900. The patents were largely for blocks of forty or eighty acres, though a considerable number were for 160 and 320 acres. If the average of the whole 900 applied for in November were but sixty acres, and the average price per acre only \$2.00—the price of unsurveyed land far from a railway—the sales for November would represent 54,000 acres. This would mean \$104,000 added to the provincial treasury. If half the claims are put under development next summer, employment will be given to thousands of men at good wages. The mining activity indicated will induce many Canadians to remain in their own country, instead of seeking employment in fields that look green at a distance.

THE Toronto Board of Trade evidently appreciates the danger to legitimate business and to national enterprise of "wild-cat" speculations. With a view to discourage pure speculations, it has resolved to list no mining properties on which less than \$25,000 has actually been spent in development work. That sum may fairly be taken to represent the cost of work to be done in the rocks at Rossland to roughly know the prospects of a mining claim. But the plan does not work altogether in favor of mining enterprise. Many a property requires that sum and far more to test its staying qualities, yet there are also many thoroughly good properties on which no such expenditure is needed to justify the opinion that they are among the best. A good, simple rule that will do justice all round, however, is hard to make.

## NOTES AND COMMENTS.

MR. ROSS THOMPSON, of Rossland, B.C., has been at the Queen's. It is after him that Rossland is called.

THE Bannockburn gold mine in the County of Hastings has changed hands. The amount paid for it, we understand, has not been made public.

THE great plank of the Liberal Conservative party was the N.P. Now, the great plank of the Provincial Liberal party should be a great and liberal mining policy—a sort of P.P.

THE Deloro mine owners are working hopefully, carefully and assiduously with their new treatment of refractory gold ores. If they succeed it will do much for the Eastern Ontario gold mines.

ASBESTOS of the very finest quality, and over two inches long in the fibre, is reported to have been found in Northern Ontario. We hope the report is correct, for there is a ready demand for a good article at good prices.

BISMUTHITE was recently discovered at the Mikado mine, (Lake of the Woods). Mr. R. H. Ahn brought here recently several very fine specimens. This mineral in the Mikado is associated with gold. It is a scarce article and is worth fifty dollars per ton in London, Eng.

THERE is an active demand for zinc-blende in England and Wales at present. The prices offered are high enough to tempt owners of zinc properties in Ontario to develop them. Offers for large quantities sent to Toronto recently could not be accepted, because we have not the quantity to supply the demand.

NEGOTIATIONS have been going on for some time between the owners (Messrs. Robt. Tuff and McConnell) of Levack nickel properties and several people in England. The sale price mentioned in connection with the negotiations is over a quarter of a million dollars. The sale, if effected, will tend to put new life into the development of mining in that township and neighborhood.

THE Rossland, B.C., district is attracting a great deal of attention in the mining world, and promises to become, before long, a strong rival of the Rand of South Africa. We regard Rossland, with all its wealth and future, as merely a gateway from the south to the great mineral resources which are sure to be developed in the Pacific Province.

WHILE London capitalists were dicker about it, Mr. George Gooderham, of Toronto, and a few of his friends in that city, bought out the War Eagle mine, at Rossland, for \$850,000. Mr. Gooderham is well known as a very cautious capitalist. And the fact that Canada's richest man has made a heavy investment in British Columbia gold mines will not be without effect in London, Paris and Berlin, in all of which cities capitalists are keeping an eye on the new Canadian gold fields. This War Eagle purchase falls only \$150,000 short of the sum offered by an English syndicate for an Ontario mine in the Lake of the Woods country, but refused by the owner.

ARSENICAL pyrites, especially when containing a fair quantity of gold, as is the case in Hastings county in many instances, are likely to become increasingly valuable, for the demand for sulphuric acid is steadily on the increase

and prices are expected to rise. Arsenical pyrites from Marmora, collected by the Geological Survey, and assayed by Dr. Hoffman, the chemist of the Survey, have yielded as much as 2.83 ounces of gold.

IF YOU have good luck in mining, let the CANADIAN MINER know about it. If you have poor, let us know, and perhaps we can help you out of it.

E. STRACHAN COX, of Toronto, has the model of a gold mine, in full working order, set up in his office in Toronto. There are a dozen puppets to represent men, to be seen, all at work.

WE wish to secure trustworthy information about mines and mining of every kind, from every part of the Dominion, and shall appreciate any favor shown us by our readers, in the way of supplying it.

SURVEYOR A. H. Macdougall has just completed the survey of twenty-five mining locations, at Lake Shebandowan. He has forty others yet to survey, also in the neighborhood of Port Arthur.

MR. DAN O'CONNOR, of Sudbury, well known years ago, as a popular host in the leading hotel of that town, has of late been engaged in mining. He was in the city on Wednesday, and spoke very hopefully of the Sudbury gold developments. Owing to recent deals in that district, much activity is expected before the close of winter. Mr. O'Connor is a pushing miner.

WHAT the development of our mining industry will mean in affording employment to men and capital may be judged by the fact that a single mine in the Sudbury country, the Copper Cliff nickel mine, has over 700 men at work. This number includes, in addition to miners, a large number of wood cutters who furnish wood for roasting and wood for other uses at the mines.

No fewer than twelve railway charters are being applied for at this winter's session of the British Columbian Legislature. The proposed railways are designed chiefly for the opening up of gold and other mineral regions, and are projected over the northern part of the province, as well as the southern, and one of them is intended to tap the Upper Yukon valley, where placer mining has been conducted on a considerable scale for several years.

SEVERAL mica mines are being successfully worked in the neighborhood of Havelock. We have seen really excellent samples of pure white mica from there of late. By the way, what reason is there for our mica being shipped in blocks to other countries, when we can cut it for most purposes in Canada? The waste bits of clippings that are manufactured for various uses may also with advantage be utilized here.

THERE are many good fellows in Rat Portage and it is pleasant to spend an evening with them at the Hilliard House in that rapidly rising town and see how happy looking are the faces of those who have been so fortunate as to secure one of the golden prizes of the Lake of the Woods—a thoroughly promising mining location. Good fortune and hope are amongst the best things to drive away dull care.

JNO. F. CALDWELL, the owner of the famous Sultana mine on the Lake of the Woods, may be regarded as one of the pluckiest men in the Dominion. With little but pluck to aid him he

fought the tide of opinion, and against the advice of mining engineers at last reached deserved success. He has a rich prize in the Sultana, worth over a million of dollars. This mine is an advertisement of Canada's, and especially Ontario's wealth in gold.

A TAX on income, over and above a reasonable interest to investors, levied on mine operators in lieu of royalty, would do much to secure justice to the investing public. As the Government would have reports on all mines developing or operating, and the right of inspecting books, fraudulent or wild-cat speculations would be discouraged, for the actual amount of capital and its true equivalent in services would be known.

MR. ALEX. M. HAY is an English gentleman who for several years has taken an active interest in our Ontario mines, especially in those of the Lake of the Woods district. He is full of energy and ability and has large investments in this country which are likely to repay him handsomely, as he is considered among mining men to be a very shrewd investor. He spends most of his time in England and on the Continent amongst capitalists, and is therefore a very good agent for Canada.

RECENTLY in England assays for gold have been made of the nickel-copper ores of the Sudbury districts. The ores were taken from the surface. They are found to contain nearly three dollars' worth of gold per ton. There is said to be in some respects a resemblance between the ores and those of Rossland. It will be well if investigations of the Sudbury ore be continued on the same lines of qualitative and quantitative analysis, for it may result in the discovery of other small amounts of minerals, and in any case may throw light on how to reduce these ores in the most economical manner.

PORT ARTHUR has always been an ambitious place, and with reasonable hopes of its ambition being moderately satisfied. It is just now on tip-toe to see if it cannot catch up to Rat Portage in the race for popularity. It has some good things—in fact a good many—in its possession. We expect to see the silver mining industry around it revive with renewed and increased vigor. We are informed by Mr. R. H. Ahn, of Rat Portage, that he has just completed arrangements with foreign capitalists for active work in the spring. Therefore the Port may hope for benefit, direct and indirect, in the revival of silver mining, for which the surrounding district affords very considerable opportunities.

WE understand that Mr. Galt, C.E. and M.E., the managing director and consulting engineer for the Gold Cliff Mining Company has begun active work at their mining property on Lake Kokogaming north-east of Sudbury.

The tunnel is being driven into the cliff near the lake level in order to intersect the vein formation and reach the contact with the diorite rock where the concentration of ore is supposed to exist. Work will be pushed during the entire winter season, and all the indications point to a very valuable mine as the veins are numerous, well defined and highly charged with gold, assaying very high. Shanties and other buildings are being erected for the accommodation of workmen.

THE "booming" of mining in Canada should be carefully guarded against by all who have the real interest of our mining industry at heart, as well as the general stability of our business and manufacturing establishments. We have, without doubt, an abundance of rich

mineral lands which should enable us to do a legitimate business that should prove both lasting, and profitable to the investor. It would be nothing short of a national misfortune if, in view of the recent developments that promise so much, misrepresentation and ill-founded schemes should shake the confidence of investors, for in opening our mineral lands we have to depend very largely on foreign capital. The country and its reputation have suffered enough in the past through "booms." We should try to avoid them for the future.

The Hansard Gold and Copper Mining Company—with five locations in the Trail Creek and Slocan regions, is one of the latest candidates for eastern capital. The company appears to be carefully organized. The capitalization is \$1,000,000 in fully paid up dollar shares; and of this \$500,000 is reserved as treasury stock for the work of development, and the remainder is deposited in escrow with the bank of British Columbia and cannot be put in the market before November 1st, and then not at a lower figure than any treasury stock then unsold. Other careful provisions are made for successful management. The mineral claims of the company are five in number:—The Hansard, the Carberry, the Tyrone, the Lone Star and the Red Cloud. The latter two are in the Slocan silver district. Development work is being pushed on several.

THE Ethel group of claims, six in number and embracing over three hundred acres are well situated about nine miles from Rossland and seven from the smelter at Trail Creek, which they overlook. The Capitalization of the company organized to work these locations is \$1,500,000 with treasury stock of \$350,000, offered at 10 cents on the dollar.

THOUGH Winnipeg is improving, there is at present just a little of a fluttering sensation in the Winnipegger's breast. The day of the prairie city's boom, and the luxurious living of that time are not quite forgotten. The Winnipegger wonders if the old times, or anything like them, will ever come again; he looks to the eastern and then to the western gold fields and wonders if anything will come out of them to revive the old jubilant spirits of the "boom" times. Well, he may take this morsel of encouragement. He will shortly see a great influx of settlers to the mining regions just east of him, and to the more distant western mining camps. This influx of miners and others will increase the home market of the city and its province, and thereby enhance safely the value of property as the price of certain products of the province rises. This is after all, more wholesome than a boom.

A GREAT deal is talked by our legislators and would-be legislators at election time. In the intervals between, the talk is not supplemented by action, or encouragement to the young and rising generation to remain at home and reap the reward to be found in developing the great natural resources of the country. Here is a fair specimen of election talk, copied from the *Mail* newspaper, of the date June 23, 1894, where it stood in bold type in the center of a page:—

"ONTARIO MINERALS LYING WASTE.

"Ontario has admittedly one of the finest mineral areas of the world, which ought to have a large industrial population, but for the twenty-two years the Mowat Government has been in power not a ton of pig iron has been taken out in the province. Is it not about time the electors tried a change and put in a progressive government?"

The foregoing is but a fair example, as has

been said, of the writing and talk that has been going on for years.

It is now in order for the people of this province to ask what has the provincial opposition striven to do in the direction of getting the mineral wealth of this province developed? Have they had any policy on the subject?

For prospecting and superficial working of veins, the Kootenay district is superior to Montana. In the latter country, as in the former, chinooks occur in winter that clear the ground from snow, but in Montana the winter cold is often and generally very severe, while in the Trail Creek district it is comparatively mild. Montana knows temperatures of fifty below zero; the lowest in the West Kootenay is but little below zero. The lakes and rivers of the Kootenay country, though they lie over a thousand feet above sea level, are never frozen over. Steamboats ply all the year round. When snow lies higher upon the mountains it facilitates the transport of supplies, and winter is really a better season for opening "finds" than summer, when (as it is at present) the roads are not well fitted for travel. Of course the prospector finds difficulty in following veins when snow is on the ground, but the winter season is short. It begins earlier than in southern Ontario, but it closes earlier also, sometimes in February. Underground mining, of course is not affected by winter, except favorably, owing to the cheaper conveyance of supplies to the mining camps.

In getting out prospectuses, the drafters should avoid putting on the extra cent figures after the straight dollars are mentioned, either in stating the capital or calculations as to profit. It is a common fault in writing prospectuses, but a very foolish one. The thoroughly wide-awake man, who knows the world, simply ascribes it to ignorance, and it is the simplest kind of smartness that hopes to impose a "wool-sack" importance on the public. It fools nobody, excepting the most ignorant, who have nothing to invest, and it arouses a shade of suspicion in the quiet little capitalist who knows not the world broadly, and cannot make allowance for the littleness or ignorance, or something else, of the man who writes \$1,500,000.00, when the superfluous 0's might be omitted. Don't do it, boys. The world, if ignorant, is not imposed upon by this childish trick. Investors try to deal with facts and reasonable calculations. Don't ruffle the feathers of the shrewd man whose temperament allows him to be irritated by trifles. State the honest truth, without childish embellishments. If you can't, then state nothing at all.

#### ABANDONED AGES AGO.

##### DISCOVERY OF SEVEN ANCIENT COPPER MINES NORTH OF LAKE SUPERIOR.

SEVEN ancient copper mines worked by an unknown and pre-historic race, have been located in Cook County, Minn., on the north shore of Lake Superior, says the New York *Herald*. In the great Superior copper region, old debris-covered copper pits abandoned centuries ago, have heretofore been discovered, but this new find is the first that has been made on the northern shore of the great lake, and the discovery gives promise of activity in mining operations in that locality, for not only have paying deposits of copper been laid bare, but some silver and a little gold have been found with the baser metal.

These mines, which were accurately located only two weeks ago, lie within a few miles of each other, immediately south of, and close to, the Pigeon river, which is the boundary line

between the United States and Canada at that point.

That the mines have not been discovered before is not strange, for Cook County is an almost isolated point of land, far from any large settlement. Though it contains 1,520 square miles of land, it has only 140 inhabitants, besides a few Indians in the Pigeon river reservation, at its extreme eastern end—about ten miles from the nearest of the seven newly discovered mines. Then the county is very hilly, rocky and wild, with little fertile land, and offers few inducements to settlers.

##### HOW THE MINES WERE FOUND.

The ordinary observer might walk all over Cook County and not be aware of the fact that he was treading on rich deposits of valuable ore, for the pits of the ancient mines have been filled with debris and been covered by brush, growing and fallen trees, and the wash from higher lands.

It requires the eyes of an expert trained in prospecting to find the signs of hidden ore; and so it was in this case, for it remained to Captain William P. Spalding—now seventy-four years old—of Sault Sainte Marie, to make the discovery.

Late in 1895 he concluded that he would look over Cook County. His search brought him success, for he discovered evident traces of ancient "diggings," and then, having associated himself with Mr. John M. Miller, of Escanaba, Mich., the explorations were continued this year.

The two men went carefully over the ground, making thorough examination and numerous excavations, with the result of accurately locating the seven pits, so that a surveyor would have no difficulty in finding them.

In a letter from Captain Spalding, in relation to his discovery, he writes:

"I claim to have been the first discoverer of 'ancient diggings' on the north shore of Lake Superior, made in the fall of 1895, in what is Township 64 north, of Range 2 east of the fourth principal meridian, Sections 4 and 5; and afterward in Section 3. The diggings are on the north side of a bluff on a mountain, on a vein running nearly east and west. On Section 5 the work is about twenty rods in length, apparently of the depth of fifteen or twenty feet. I have sunk in these diggings two pits, from eighteen to twenty feet deep. On the foot wall of the vein in the bottom of the pits I found charcoal and ashes, but did not reach the bottom of the diggings on account of water.

"In another pit, just off these works, I sunk fifteen feet to a vein, which had been greatly disturbed. I found water that was plentiful and free, and which I suppose comes from the lake, which is close by the shaft. From this pit I took out very fine specimens of both gold and silver, besides the copper. The vein is quartz, and both walls are talcose slate.

"I found no tools or stone hammers, but from the evidences the work was done by building a fire on the vein, heating it to a high temperature, and then cooling it suddenly with water, which would have the effect of loosening the ore. The copper was then broken out with stone hammers. This was the ancient mode of working the mines on the south shore of Lake Superior.

On Section 5 I sunk sixty-five feet just outside of the old work, on the north, expecting the vein to come into my shaft at a depth of 110 feet—as the dip is toward the north—but I put in a diamond drill and bored forty feet at an angle of forty-five degrees before I struck the vein. In this vein I took out some valuable specimens of native silver and silver glance. I will continue the work here next year.

"On Section 3, there is old work on a vein which unites with ancient diggings where

two immense pits were dug by the prehistoric miners.

"Near this junction, to the north, there is a mound, which should be opened, and I intend exploring it on some future day. Not far from this mound there is apparently a road bed of loose stones, which might have been the road to Lake Superior, and the destination of the product of the mines.

"I have found no tools, so far, but this is no evidence that they will not be found in the future.

"I think the ancient works on these lands are the most extensive ever found."

It is not at all unlikely that the mound will be found rich in tools, in ornaments of copper, silver and gold, and more than likely in skeletons of the very people who made these excavations.

That tools will be found in these mines is not improbable, for in others opened on the south shore of the lake, on which trees of great age were growing, great numbers of stone hammers, or mauls, were found; also a few wooden shovels, strongly resembling canoe paddles, together with the remains of wooden bowls for baling, birchbark baskets, and some spear or lance heads, beads, pins, and axes of copper.

Whether or not the mound that is to be opened will solve the problem of the age of the mines, remains to be seen. Great antiquity has been assigned to these workings by some writers, and it has been suggested, and not without reason, that a busy industry was suddenly interrupted in them at some time over five hundred years ago. The finding of a tree, with 395 rings, growing in one of these ancient pits, has been used to support an argument that the working must have been abandoned at least as long ago as the middle of the fifteenth century, or some fifty years before the voyage of Columbus.

#### ENGLISH CAPITAL COMING TO CANADA.

SEVERAL large deals have been reported from the Lake of the Woods district during the past few months. Among these we might mention the sale of the Mikado, the Cornucopia, the Triumph, the Standard, and, besides, several groups of undeveloped properties: The aggregate amount paid for these properties is about a quarter of a million dollars. These sales have been negotiated by Mr. Robert Ahn to the satisfaction of all the parties concerned. This is creditable to Mr. Ahn's ability, and is a proof of his high standing with capitalists in England, where these limits and prospective properties have been sold.

#### USES OF PLUMBAGO.

THE use of plumbago in mechanics continues to develop. Originally used for crucible manufacture and as a dry finish or polish, its use later led to a marked advance in our wheel grease. Eventually it found its way into the iron foundries as a facing powder; next the self-lubricating journals marked it a true friend and economiser. Now we have it brought before us as a rust preventer and general preserver of iron surfaces, in which capacity the discussions in the American Painters' Associations show that it far exceeds red lead or iron oxide. Not only does it give a smooth finish fit for a yacht bottom, and slips on with very little brushing effort, but being an inert substance, it is quite unaffected by heat or frost, rain or shine, acid or alkali. It has besides the essential advantage of being cheap. Plumbago is found in considerable quantities in eastern Canada.

Our mailing list embraces thousands of the leading moneyed men of Canada. For substantial mining companies, no better medium offers for reaching investors.



## CANADIAN GOLD MINES IN LONDON.

The *London Financial Times* recently said: "The other day we had to record the appearance of a Canadian gold mining company on the London market. We believe that this was the first time public subscriptions have been asked for here on behalf of a Canadian gold mine, and we are much mistaken if it does not prove to be the forerunner of many others. It is ascertained beyond doubt that British Columbia contains a vast quantity of the precious metal, and a couple of months ago we gave a sketch of the history of mining in this field since 1851, and pointed to the extraordinary development of the industry which took place last year. Public interest in the prospects of British Columbia, particularly as a gold field, is increasing here, and the report of the Columbia Board of Trade, covering the year ended July last, which deals chiefly with mining, will, therefore, be read with close attention. Very encouraging are the facts and figures therein set forth. So much so, indeed, that there appears small room for doubt that plenty of scope will be found in the district ere long for the profitable employment of British capital, though, as elsewhere, great care must be used in selection. The mining laws of the country are very favorable to prospectors and a hardy young fellow who could command a little capital and possessed some knowledge of mining might do worse than take his chance in that magnificent region."

## AN EXPERT'S OPINION.

BRITISH COLUMBIA THE GREATEST GOLD FIELD IN THE WORLD—SO SAYS ONE OF THE LEADING MINERS OF AMERICA.

MR. JNO. M. BURKE, one of the best known miners in America, and often called the pioneer miner, is staying at the Queen's. He is a clean shaved, neatly dressed gentleman, with a keen eye and kindly face, and though very decidedly gray-haired, is evidently yet in his prime, and full of the energy of early manhood. He has been mining continuously for twenty-eight years. He hails from Virginia. His mining operations have been conducted in Nevada, Utah, Arizona, New Mexico, Idaho, Montana, and of late in British Columbia, and probably no man in that Province, perhaps no man in the West, has a more wide and practical experience in gold and silver mining, or a keener eye to detect in the nature and lay of the land the value of any new mining country. He has a very high opinion of British Columbia as a mining country—in fact he pronounces it the richest in precious metals that he knows anything about, either by personal experience or the descriptions of his mining friends in mining countries in other continents than America. He has made considerable investments in the Rossland country.

The *CANADIAN MINER* interviewed him the other evening, when Rossland, mining laws, rock formations, cost of mining, and many other matters closely connected with mining were discussed.

On development companies Mr. Burke was cautious. Development work requires practical men. Such men might superintend a number of locations, if they had practical men to submanage each location.

As to the ore and general rock of southern British Columbia, he said that in Slocan and also at Fort Steele in Eastern Kootenay, the ore was similar to the silver-lead ores south of the boundary, as in Montana, but of higher grade. It occurs in diorite and syenite principally, but in the United States in quartz and soft slate. In Rossland, the gold has a base principally of iron and copper. The ore, on an average, contains about

forty-five per cent of iron, five of copper, twenty-two of sulphur, three of arsenic, two of antimony, and the remainder silicate. The average ore produces per ton \$35 in gold—taking the Le Roi, War Eagle, Josie and Iron Mask as tests. It costs about \$18 per ton to work the ores, but with competition better transportation facilities and the application of science, especially chemistry, the cost will be greatly reduced, and there are large quantities of ore at present unused because they are not paying ores, that will before long be treated and gold extracted in sufficient amount to make them pay well. Smelting is at present the method in vogue in treating the ore, but later there will come improved methods which will reduce the cost of mining and milling to a fraction of the present cost, and very low grade ores will prove profitable.

The Alberni gold district on Vancouver Island, Mr. Burke says, shows the same ore as that in Rossland, and requires similar treatment. He had not visited some of the mining centres, but from what he had seen and heard he thought there could be no question of the abundance of gold and other minerals all over the country.

As to comparisons with States across the border where he has mined, he said, "The veins are longer and stronger, that is better defined, and richer than in the States. A marked characteristic, uncommon southward, but in Rossland all but universal, is the increase in quantity and quality as depth is attained. The veins are wider and richer as you go down."

"I have no doubt about the Kootenay or British Columbia from what I have seen elsewhere and seen in that Province. It is the greatest mining country in the world, and judging from the accomplishment of present developments it will attain the foremost rank in from five to ten years."

Speaking about charters, Mr. Burke said that the British Columbia charters were very good, and the plan of securing prospects excellent. Washington charters were also good. They cost in legal expenses and otherwise about \$150. To register them in British Columbia required an additional \$7.50. "The British Columbia system of granting lands is the best I know of."

In regard to royalties or taxes on mines, he said that the British Columbia government had proposed putting a tax of two per cent. on the gross output of the ores. This thoroughly aroused the miners, and from his camp he and others went down to the Legislature and along with others protested. The Government withdrew the proposal and in lieu of it put a tax of one per cent. on the net product. Had the Government imposed the two per cent. tax, he was satisfied that the present gold development could not have taken place. "Capital, you know," said he, "is very timid in a new gold field, and men with money will not invest if they think they will be taxed whether fortunate or not. They need encouragement to invest, and should not be frightened off, even by small taxes."

Asked if there was much wild-cat speculation in British Columbia, Mr. Burke said: "There is a good deal, and more to be feared. Companies do not always have claims sufficiently developed even to guess that they are likely to turn out well, and perhaps sometimes even mineral lands might be exploited without anything but a guess that some neighboring vein ran through them. Of course, sometimes a property would turn out all right and the company cease to be a wild-cat. There was not enough capital allowed for development in many cases. The country for miles around Rossland is taken up, whether veins are found or not. But so far things have turned out very well. The War Eagle, which two and one-half years ago was

bought for \$35,000, has since paid \$185,000 in dividends, and has been sold to Toronto parties for \$850,000. Le Roi is paying \$25,000 a month. So far indications, where work is being done, are very good. The ore is low grade and refractory. It has great staying power: it improves with depth. Perhaps there is something in the idea that the heat at the time of deposition in the lower depths of the masses may have something to do with this richness—but there is no doubt that on every hand the appearances indicate marvellous richness and permanency."

"How does development at present stage compare with that of Butte, Montana, at the same age?"

"Rossland is very much further ahead, alike in population, development and production. Rossland, however, is a little ahead in transportation facilities compared with Butte at a similar age."

"How is Rossland governed?"

"It is unincorporated. It comes under mining laws, and is governed by a gold commissioner and a special constable. The gold commissioner is a good one, and order and equity rule. There are thirty-five saloons and hotels. The limit is not fixed by population, but under a special law adapted to the requirements of mining camps."

In reference to the ownership of mines and claims he said that about nine-tenths of the companies and capital at Rossland was American, and the other tenth chiefly Canadian.

Asked about Ontario gold mines, Mr. Burke said he had not had an opportunity to see them, but intended to visit some of them at an early date.

## THE WORLD'S GOLD PRODUCTION.

The *New York Engineering and Mining Journal* compares the world's production for the last two years in the following table:

Countries.	1895.	1896.
North America—		
United States.....	\$46,830,200	\$57,000,000
Canada.....	1,910,921	3,750,000
Mexico.....	5,600,000	6,989,000
Gen. American States	480,000	498,705
South America—		
Argentine Republic..	93,015	93,015
Bolivia.....	65,000	68,211
Brazil.....	2,232,360	2,480,400
Chili.....	466,209	475,410
Colombia.....	3,183,180	3,100,500
Ecuador.....	78,546	78,546
Guiana (British)...	2,170,081	2,385,318
Guiana (Dutch)....	584,795	564,870
Guiana (French)....	1,866,088	1,876,671
Peru.....	75,445	79,745
Uruguay.....	141,600	141,600
Venezuela.....	851,600	851,600
Europe—		
Austria-Hungary...	1,829,300	1,829,300
France.....	240,600	240,600
Germany.....	2,357,144	3,392,366
Italy.....	186,071	186,071
Norway.....	10,335	10,335
Russia.....	31,781,851	31,599,097
Sweden.....	624,750	624,750
Turkey.....	8,000	8,000
United Kingdom....	136,422	124,020
Asia—		
China.....	4,650,750	5,167,500
India (British)....	4,519,894	6,002,568
Japan.....	424,070	516,750
Corea.....	206,700	206,700
Malay Peninsula....	103,350	103,350
Africa—		
Transvaal.....	42,993,869	43,184,818
Other Countries....	1,550,250	2,067,000
Australasia.....	42,793,824	43,709,322
Indian Archipelago...	51,675	92,715
Totals.....	\$201,107,895	\$218,499,853

If you want to make money through gold mines, buy the *Canadian Miner*. Price 10 cents per number, or \$2 per annum.

## WEST ONTARIO GOLD.

## FIRST BULLETIN ISSUED BY DR. COLEMAN.

PRELIMINARY REVIEW OF HIS SUMMER'S WORK  
IN LAKE OF THE WOODS AND SEINE  
RIVER DISTRICTS.

The following bulletin has been prepared by Dr. A. P. Coleman, geologist and mineralogist of the Ontario bureau of mines, as a preliminary report of his work in the gold fields of Western Ontario during the past summer. The detailed results are reserved for the sixth annual report of the bureau. Dr. Coleman's report reads:

Gold is very widely distributed in the province of Ontario, having been found at many points between the townships of Madoc and Marmora in the east, and the boundary of Manitoba, more than 900 miles to the north-west. In the eastern part of the province it has been obtained to a greater or less extent at several points east of the town of Peterborough, such as Deloro, Belmont and Madoc; near Parry Sound, on the Georgian Bay; east of the famous Sudbury nickel mines at Wahnapiatae, from which magnificent specimens come; west of Sudbury, at the Vermilion mine; north of Lake Huron, at the Ophir mine, in Galbraith township; and north of Lake Superior, at the Empress mine, near Jackfish Bay; but the most promising region at present lies west of Lake Superior, from Moss township, to Shoal Lake, on the boundary of Manitoba.

The gold deposits of the eastern part of the province have been known for thirty years, and have been worked to a small extent during that time; but some of the ores are difficult to treat, such as those mined near Deloro, and it is only recently that the difficulties seem to have been successfully met, so that their development belongs to the future. The deposits near Sudbury also are attracting attention, but cannot yet be called mines. On the north shore of the upper lakes only the Empress mine requires mention. Here work has been begun on a series of bedded or lenticular quartz veins, enclosed in green Huronian schist, near an outcrop of granite. A very complete ten-stamp mill has been at work for some months, and several bricks of gold have been obtained. The ore is not high in gold, and is rather refractory, so that not more than forty or forty-five per cent. is extracted by the stamp mill, the rest being contained in the concentrates, which consist of iron and copper pyrites, with some galena; nevertheless the gold obtained by free milling methods already more than pays for the mining and milling. By tunnelling in from near the foot of a lofty hill the veins can be struck about 140 feet below the level of the present open working, and the ore obtained in the easiest way, without the need for hoisting or pumping apparatus. When this tunnel is made, supposing that the veins retain their present thickness of about twenty feet in all, the mine should afford at least a reasonable return for the comparatively small capital invested.

Attention is, however, specially directed at present to the main gold region of Ontario, which extends for more than 250 miles from Moss township westward and has proved to be at least 130 miles wide, between the Little America mine just south of the international boundary in Minnesota and Lake Minnetakie twenty miles north of the Canadian Pacific railway. Here the number of locations, usually of forty acres each, taken up for gold mining purposes within the last four years runs into the hundreds. Many of these will of course not prove workable mines, but, on the other hand, new finds are constantly being made, sometimes in quite new localities, sometimes in regions supposed to have been well explored years ago.

In general the gold bearing veins occur in

green chloritic and hornblendic schist, probably of Huronian (Keewatin) age, and are of a bedded or lenticular kind; but sometimes they are found in masses of eruptive granite or gneiss which have pushed their way up through the Huronian schists. In the latter case the veins are commonly true fissures, and may be followed for considerable distances. In either case the contact of an eruptive rock with schist seems of importance, since the best veins are found within a mile or two of such a contact.

In addition to gold bearing veins there are deposits of other kinds which are worthy of attention, such as fahlbands, wide bands of schists heavily charged with sulphides, and showing a considerable amount of free gold; and dikes of felsite or quartz porphyry containing pyrites and gold; though up to the present none of these have been mined sufficiently to prove their value.

During the past summer all the gold deposits on which any important amount of work has been done were visited, except the Huronian mine in Moss township; and it is proposed to give a brief preliminary report on what was observed.

Our canoes were dropped in the water at Savanne, a station on the Canadian Pacific railway seventy miles west of Port Arthur, and traversed nearly 700 miles of lake, river and portage before ending the summer's travels at Rat Portage. On Lacs des Mille Lacs and the waters of Partridge river no delay was made, though gold was found years ago by the McKellars on Partridge Lake.

On and near Reserve Island in the river Seine, near the entry of Partridge river, several gold bearing veins have been discovered, and two or three of them are being opened up by Mr. H. B. Proudfoot, but at the time of our visit his shafts had not been sunk more than twenty feet and it was impossible to judge of the real value of the locations.

On Sawbill Lake, which opens into the Seine from the north, some distance below Proudfoot's camp, and thirty-three miles south-west of Bonheur station on the Canadian Pacific railway, the now well-known Sawbill mine is situated. At our arrival early in July we found that a shaft had been sunk to a depth of forty-nine feet, and that the vein had increased in width from four feet on the surface to six at the bottom and showed very distinct walls. The vein can be traced for more than a quarter of a mile on the surface, and will no doubt afford a great quantity of ore. The quartz contains the usual sulphides, and free gold can frequently be seen. Mr. F. S. Wiley, the manager, states that the shaft has since been sunk below ninety feet, with no diminution in the width of vein nor in the gold contents of the quartz. It is worthy of special note that this promising mine is in what has been mapped by the Geological survey as biotite-granite gneiss of the Laurentian, so that gold occurs in satisfactory amounts in a rock hitherto looked on as barren. Several other gold bearing veins of a somewhat similar kind have been located in the region since work began at the Sawbill mine, and there is reason to suppose that diligent prospecting will disclose a number of valuable deposits.

Still further down the Seine, a little west of its expansion, Steep Rock lake, the Harold Lake mine, owned by Messrs Wiley and Gibbs, is situated. Here several veins, in general, not very large, have been more or less opened up by shafts or drifts, and a five-stamp mill worked intermittently has yielded a number of gold bricks. One small vein on the shore of Harold lake, contains ore exceedingly rich in free gold, in leaf form. The country rock here is quite varied, granite of the greenish altered kind often called protogene, piercing green and yellowish rocks of the Huronian.

From this point westward to Shoal lake,

another expansion of the Seine river, no mining has been done, though a number of locations have been taken up, especially west of Calm lake.

Shoal lake may be looked on as the focal point of the Seine river and Rainy lake gold region, hundreds of locations having been taken up during the last three years within a radius of ten miles of this small lake, and a very considerable amount of work has been done on several of the properties.

Up to the present the most important mines have been found within a area of protogene granite about six miles in length, from north-east to south-west and about a mile in width, lying between Shoal and Bad Vermilion lakes. The whole granite area has been located and scores of veins have been found, varying greatly in gold contents, but generally true fissure veins with well defined walls of slickensided talc or sericite schist.

The largest amount of development has been done on the Foley mine, now owned by the Ontario Gold Mines Co., the property comprising AL74, 75, 76. On one of their veins, the Bonanza, one shaft has been sunk to 210 feet, and another 1,200 feet away to a depth of 113 feet, and more than 300 feet of drifting had been done at various levels, at the time of our visit, July 17th. The vein proves very uniform in width, running from 2 1-2 to about 4 feet, and the ore, which contains a considerable amount of visible gold, is said to average \$20 in free milling gold and \$5 in concentrates per ton. By this time a well equipped twenty-stamp mill is being erected, and before the new year should be producing gold. There is every reason to expect that this will prove a very profitable mine.

The Ferguson mine is situated north-east of the Foley mine, in the same area of granite, on locations AL110, 111 and K223. This property is owned by the Seine River Gold Mines Company, of England, which is at present doing mainly exploring work. There are several veins, ranging from a foot to three feet or more in width, and traceable for hundreds of feet. On the Daisy vein two shafts had been sunk to a depth of fifty feet and sinking had been begun on the Government vein at the time of our visit, rich specimens coming from the latter ore body. On the Finn vein, one of the widest, a shaft had been sunk seventy feet. The work thus far done shows that the veins are not usually very wide, but that there is in the aggregate a large amount of fairly rich ore available.

The only other property in the region requiring special mention is the Lucky Coon, or Hillier mine, on 655P, where a shaft has been sunk to the depth of about fifty feet on one of the veins, and a five-stamp mill erected. The quartz looks well, and the vein chiefly worked is about eight feet wide at the bottom of the shaft. Owing to disagreements among the owners the mill was run for only a short time. This mine has been taken hold of by Edinburgh capitalists, who propose to develop it this winter, with the intention of purchasing if the results are satisfactory.

Many locations have been taken up in the Keewatin schists east of Shoal lake, and also along Little Turtle river and lake, north of Bad Vermilion lake. These deposits are mainly bedded veins or fahlbands, and have been very little developed, though rich specimens of free gold come from them, and a plucky company of Norwegians have pounded out a few hundred dollars worth of gold with hand stamps, from a vein on the Little Turtle.

On Rainy lake itself gold has been found at a number of points; but the only mines worked are two in Minnesota. Of these only the Little America mine, on a small island near

Rainy Lake City has produced much gold. From it several thousand dollars worth have been obtained, and after many vicissitudes it is now said to be worked at a profit. Minnesota, however, contains only a narrow fringe of the gold bearing Huronian rocks which cover so wide a surface to the north and north-east in Canada.

North of Rainy lake and south of the Canadian Pacific railway, at Wabigoon, is a very promising region on the shores of Lake Manitou and smaller bodies of water near by. Ore deposits of varying kinds and of all degrees of richness occur here, and brilliant specimens are found, but nothing that can be dignified with the name of mining has yet been attempted. A two-stamp Tremaine mill has been at work for a time under the management of Mr. E. B. Haycock, who reports an average of \$25 per ton from small amounts of rocks obtained from a number of veins on Lake Manitou, in the aggregate about eighteen tons. Difficulty of access from the want of a summer wagon road by which to bring in the supplies and machinery, has retarded development in this district.

Gold has been found at various points north of the railway, e. g. on Minnetakie and Sturgeon lakes; but the locations are yet only in the prospecting stage.

A canoe journey westward over seldom visited waters, took us from Manitou lake to Regina bay, a part of Whitefish bay, the long south-easterly projection of the octopus-armed Lake of the Woods. The Regina mining camp with its trim buildings, comes as a pleasant surprise to the canoesman, who for five days has seen no human being outside his own party. The Regina (Canada) Gold Mine company, limited, of London, England, is operating this mine, Lieut.-General H. C. Wilkinson being managing director. At the time of our visit a shaft had been sunk 160 feet, and 500 feet of drifting had been done on the main vein, besides the sinking of small shafts for the testing of one or two other ore deposits. The vein on which most work has been done begins in a mass of protogine granite near the shore, and runs into a wethered diabase (trap) toward the south. There is a rich shoot of ore running down through the granite into the diabase. The gold is fine and difficult to save by the present concentrators. The mill is of ten stamps, and the number of men employed about fifty.

Many locations have been taken up near the Regina, and further north-west, on Yellow Girl and other bays, but none have been worked seriously. Nearer Rat Portage, however, especially along the contact of Laurentians and Huronian, running north-west from Andrew bay to Black Sturgeon lake, a number of shafts have been sunk, generally to a depth of fifty feet, and at several points abandoned or active mining plants may be seen. At the time of our visit only two mines were producing gold, the Golden Gate, whose ore was being crushed at the mill of the adjoining Gold Hill mine, and the Triumph, which was having its ore tested with a two-stamp Tremaine mill.

There are a number of other promising properties, including some wide fahlbands, north of the Canadian Pacific railway, such as the Scramble mine, and two or three others said to have been found by the aid of a divining rod imported from Sweden. However found, these sulphide bearing bands of schist readily yield gold in the pan, and probably some of them will turn out valuable mines.

The most justly famous mine in our whole western gold field is undoubtedly the Sultana, on an island seven miles south-east of Rat Portage, owned by Mr. John F. Caldwell, of Winnipeg. After years of hard struggle against adverse circumstances, this plucky and energetic

mine owner is reaping a solid reward in the shape of a great body of rich quartz in places forty feet wide, and already followed more than 300 feet in depth. Nearly a thousand feet of drifting has been done and there is ore enough in sight to keep the well-equipped ten-stamp mill, or one double its size, running for years. The ore bodies appear to be lenticular, the lower one of immense size, and are enclosed in the sheared and schistose edge of an area of coarse porphyritic granitoid gneiss, mapped by the geological survey as Laurentian, but adjoining green Huronian rocks. The one is somewhat quartzitic looking, containing one or two per cent. of iron pyrites, and is free mining to the extent of seventy-five or eighty per cent. A recently finished chlorination plant extracts the gold carried by the sulphides very satisfactorily. Gold mining at the Sultana has been reduced to a thoroughly business-like basis, the mill running with scarcely a halt and the weekly brick being turned out with perfect regularity. If this splendid mine had been in the hands of a stock company much would have been heard of its dividend-paying powers; but its owner is too modest to boast of its success.

Perhaps the most interesting mining development of the year is to be found on a western Shoal lake, thirty-five miles from Rat Portage and about ten miles east of the boundary of Manitoba. The Mikado mine, found by an Indian a year ago, has been purchased for \$25,000 by a London company under the chairmanship of Col. W. T. Engledue, and has been worked sufficiently to show that the ore is very rich, though not enough sinking has been done to prove the extent of the deposit. The quartz contains a variety of sulphides, including a sulphide of bismuth new to the Lake of the Woods region, and a considerable part of the gold is carried by these refractory minerals; but probably two-thirds of the gold contents are free milling, the gold occurring as thin plates rather than nuggets. The ore treated is the richest found in large quantities in Ontario, and the ore now on the dump after only a few months' work by a small force contains values sufficient to pay for the mine and a simple equipment.

Several other finds of very rich ore have been made in the vicinity of the Mikado, and next summer will probably see the development of an important mining camp in that district.

At a number of other points on Lake of the Woods and its bays promising finds of gold have been made, e.g. at Camp Bay to the south-east, but none of them have been worked sufficiently to make sure of their value.

Looking at our gold mining region as a whole, one is struck by the wide extent over which gold has been found, the variety of deposits that occur, the ease with which they may be reached, the free milling character of most of the ores, all points in its favor as compared with most gold regions.

No part of the region is more than forty miles from a railway or steamboat, and most of the mines are within a few miles of the rails or of navigable waters. In winter a road sufficient to take in heavy machinery may be made without difficulty to any point in the region, and the Ontario Government has shown itself liberal in granting assistance to such roads.

All parts are readily reached by canoe in summer. Plenty of water of good quality is found everywhere, and wood for fuel, building or mine timbering almost everywhere. The region is not an inaccessible desert, nor covered with malarious swamps, nor cut off from civilization by precipitous mountains. Supplies of all sorts are cheap; efficient labor can be obtained on easy terms, the labor of white men, not of negroes or Indians; and life and property are as safe as anywhere on the globe.

The laws relating to mining and mining

locations are simple, and generally admitted to be fair and favorable to the prospector and mine owner. All locations are bounded by east and west and north and south lines, reducing boundary disputes and the customary litigation of mining countries to a minimum.

In conclusion, the impression formed during the summer's work may be summed up in the statement that the prospects are better than ever before. One mine has already proved to be a splendidly paying property, and several others are apparently on the point of becoming so. The number of properties on which promising finds of gold have been made has greatly increased, and the area of known gold bearing rock has been considerably widened. Many of the properties located will no doubt prove of little value, as is the case in every mining region of the world; others will not turn out to be extensive enough to justify an independent mill, though they may be worked at a profit when within reach of a customs' mill; but it may be looked on as certain that a considerable number of the locations taken up will eventually prove to be paying mines.

#### NOTHING ON EARTH LIKE IT.

BRITISH COLUMBIA BEATS SOUTH AFRICA IN GOLD—A BUSINESS MAN'S OPINION—CROW'S NEST, WILD CATS, AND MANY OTHER THINGS.

MR. R. L. PATTERSON, the genial, robust, solid-minded type founder of this city, the encourager, as chairman of the High School Board, of every effort "to teach the young idea how to shoot," has of late taken to learning the science and art of mining. He has just returned from British Columbia where he has spent two months in the gold fields, chiefly in the West Kootenay, and has, no doubt, made many investments in the hope of getting the yellow metal by a more expeditious method than even a prosperous business at home will enable a man to get it. THE CANADIAN MINER met him the other day in its office, that high up over the other buildings towards the bay, overlooks the dull grey wintry waters of Lake Ontario, beneath which no precious metals seem to lie save those dropped overboard by some careless passenger, or sunk with some unfortunate craft the angry seas have engulfed. Mr. P. looked a very contrast to the dull waste of gold-barren waters seen through the windows. Sparkling, fresh, younger than ever after his trip to the Pacific Province, and wick eyes that revealed his thoughts of gold as clearly as the X rays could have revealed the golden metal in his pocket, he answered the interviewer's unexpected queries. He believes in the future of the British Columbian gold fields and has practically proved it by his investments. "Bob's" opinion, as his friends in the East know well, is generally a very careful one. He is never known to get beyond his depth.

"Did you see much of the mining of British Columbia?"

"Yes, a good deal, chiefly in the West Kootenay, around Trail Creek and the Slovan silver region, which are enormously rich. I learned from others about the development of mining elsewhere in the province. Mining is yet in its infancy in the province. Only a few thousand square miles have been prospected, and very little, comparatively, developed."

"What is your opinion of the country—as to its future—and the permanency of the mining industry now started?"

"Well, from what I saw and what I learned from experienced and careful men, it is difficult to over-estimate the future. English capitalists have experts there examining and reporting. They are much impressed with the showings already made. Germany and France are also

represented by careful men who know what they are doing. Mr. John M. Burke, the 'pioneer' miner of the West, as he is often called, and a man of very large experience, tells me that the country surpasses anything in gold mining he ever knew or heard about. He says South Africa is not equal to it. The great South African development has risen from very little to an output of 51,000,000: British Columbia he thinks will in the same period of time, say seven to ten years, double that output—that is to say before seven to ten years are over will probably produce over 100 million dollars of the precious metal and beat every other country in the world.

"There is a staying quality in the low grade ores of British Columbia. And if the ores are refractory, and if in many new mines a great deal has to be dumped at present before pay ore is reached, the pay ore is very profitable, even at present, and all the real mines so far, and even "wild cats," as they once were, (launched without proper development to even superficially test them,) have turned out well, improving in quality and quantity downward. When the cost of mining is reduced, as it will be soon, to less than half what it now is, much of the unused dumpings will be treated with large profit."

"For a radius of three miles around Rossland all the land is taken up. Where no veins are known it is taken up because of the chances of a vein crossing the location. Strange to say, few claims have been abandoned, and these, so far as I know, are the two mines from which the Camp is deriving its reputation, viz., the Le Roi and War Eagle; and now the latter has just been purchased by the Gooderham Syndicate at a cost of \$850,000—a deal that will be of great benefit to Rossland and vicinity."

"What do you think of the basis on which the Rossland companies are founded?"

"It is often defective. And the defect is a serious one and should be watched by those who propose to invest. Enough treasury stock is frequently not allowed, and companies are launched where the total value of treasury stock is wholly inadequate to develop a prospect into anything like a mine. The promoters ask too much. Whatever nominal price may be paid on stock, care should be taken that enough is reserved to answer from time to time the demands for opening the mine. At first a sufficient issue of treasury stock may be made to do enough work to form an approximate estimate of the likelihood of the mine turning out well. Then a second issue of stock may be made where indications are good, and may be made at higher figures. With each new issue, as encouragement is found and reported, the price of the treasury stock will go up. An investor should calculate just what can be done at the few cents on the dollar of the small proportion of treasury stock some companies have. Five thousand, or ten thousand dollars, what will it do in developing so as to reach paying ore? Of course, in rare instances, pay ore may be reached with comparatively little expenditure and the mine begin to pay for its further development, but generally it requires a large outlay before a mine becomes a shipping mine."

"What are chief needs of the Kootenay?"

"There are three—the Crow's Nest Pass Railway, more smelters, and the preventing of 'wild cats.'

"The railway through Crow's Nest Pass to the coal fields of Alberta would furnish cheap transportation for ore and coke—especially if the road is built and operated by the Government. It would be well for the Government to own it, for railway corporations take all that they can get out of any industry. The Government might at first have to run the road at

some loss, but it would pay the country in the development of mining and finally pay directly from the traffic of a large community.

"More smelters are needed. There is one at Trail, but the capacity is only 250 tons a day. There is another at Nelson of 150 to 200 tons per day, but it is occupied with local work, and cannot help Rossland. It is proposed to enlarge these smelters, but more are wanted.

"Then as to 'wild cats.' I think that every prospectus of a mining company should be accompanied by the report of one or two Government experts. The Provincial Government might appoint one and the Dominion another expert to examine the claims or prospects and state honestly what has been done in development and what indications are. Then the public would not invest in ignorance of what they were doing, or on the sometimes highly colored report of some one employed by the promoters to make a report. I do not say there are yet many 'wild cats,' but there might be companies formed whose pretensions would be as 'baseless as the fabric of a dream.'

"But couldn't the Government experts be improperly influenced?"

"Not if men of the calibre of Mr. Carlyle, the head of the British Columbia Mining Bureau, were appointed. Such men could not afford to lose their reputation and standing."

"Have you seen any thing of the gold mining of north-western Ontario?"

"Yes, I spent a short time there. The region is wonderfully rich, and has the advantage of the ore being nearly all free milling. At Rossland there is only one mine with free milling ore—that is the O.K. I think that under favorable circumstances free milling ore could be turned out for perhaps \$1.50 a ton."

#### THE PROFITS OF MINING.

THE statistics of mining are suggestive in many ways. Where mining is conducted by capable men, from the inception of a mining enterprise to the actual working of a well-developed mine, the results in some parts of the world, as in the south-west of England, are very satisfactory, and it is said that only a few of the enterprises fail to produce to investors at least a fair profit. But the miners in England are very generally "to the manner born." In America there has been much incompetent management, and much exploitation of people's purses by persons who know little or nothing about mining. Yet even here the returns are frequently marvellous, and, on the whole, are very encouraging, especially to those who do not stake their whole investments on a single cast. Most of our mines are new enterprises, in operation generally not more than a very few years, yet the returns of one hundred and thirty prominent dividend-paying gold, silver, copper and lead mines in the United States, with a capitalization of \$495,785,000 show, according to a detailed list published in the *Engineering and Mining Journal*, of New York, dividends paid up to Oct. 1, 1896, amounting to \$267,920,126, or nearly fifty-four per cent. of their nominal share valuation.

Amongst the list are several properties of enormous productiveness. The Calumet and Heckla copper mine, in the Lake Superior region, stands distinctly first in profitability. With a capitalization of only \$2,500,000, in 100,000 shares of \$25 each, it has actually paid \$46,350,000 in dividends, or nearly nineteen times over the stock subscribed. The Ontario, of Utah, is second, with dividends of \$13,325,000. The Horn Silver, of the same State, has paid \$5,130,000; the Homestake gold mine of South Dakota, \$5,993,750; the Mollie Gibson, of Colorado, \$4,080,000; the Granite

Mountain, of Montana, \$12,120,000; and the Savage gold mine, of Nevada, \$4,460,000. Previous to the consolidation in 1884, the California mine, of Nevada, had paid \$31,320,000 in dividends, and the consolidated Virginia \$42,350,000. These two properties belonged to the so-called Bonanza group. The Alaskan Treadwell gold mine has paid dividends of \$2,950,000 on a nominal capitalization of \$5,000,000.

The total capital stock of the twenty mines on which the assessments are given amounts to \$132,300,000. Yet the entire amount of money levied on this stock has been only \$5,021,016, or barely over three per cent. The Mollie Gibson mine, with its capital stock of \$5,000,000 and its dividends of over \$4,000,000, actually assessed its stockholders only \$20,000. The Homestake with its twelve and a half millions of stock and dividends of nearly six millions, assessed its stockholders only \$200,000. Whatever share prospectors and promoters have obtained of capital stock, the average call in cash—if three per cent. be assumed to represent the average over the one hundred and thirty mines—on the \$195,785,000 would be less than \$14,000,000, a wonderfully small investment to produce total dividends of \$268,000,000, for it must be remembered that most of the mines mentioned are of comparatively recent development.

#### CANADA'S GOLD FIELDS.

BRITISH COLUMBIA and the region north of it in the Yukon valley may prove to be as rich in gold as the Rand of South Africa, or the region southward in the United States and Mexico, of which the British Columbian rock formations are a continuance. With time, further discoveries will be made of rich bodies of ore, till, perhaps, the immense stretch of over 1,000 miles beyond the southern boundary of British Columbia, will with its advantages of generally abundant wood and water—at least in its southern half—and ready access to the sea, prove greater in gold and silver mining than any other country in the world is at present.

But eastward in Canada there is another region of extraordinary promise, in those spots and stretches of the Laurentians, known as Huronian. The Laurentians stretch for thousands of miles north of the St. Lawrence valley and north westward to the shores of the Arctic Ocean, and inferentially the Huronian rocks abound everywhere in this vast belt. In the southern portion—that north of the St. Lawrence and Great Lakes—wood and water are everywhere, and means of ingress and egress generally not difficult and often easy and cheap. So far the search for minerals has been amply rewarded. Veins of gold and silver are in many places very frequent. Little of the country has yet been explored by the miner, or in fact by any one except the Indian. For the prospector the opportunities are exceptionally good. The ice of the glacial period has swept the surface bare, and except the presence of a not over-luxuriant vegetation and the existence of swamps, there is little to hide the veins from view. Moreover the ores of the Huronian are largely free milling ores, requiring the simplest and cheapest methods of extraction: where a quarter of a million dollars may be required for satisfactory mining in the Rockies, one-tenth of that sum will often suffice in the Huronian mines of Ontario. In fact, it would seem as if no gold region in the world offers the inducements to miners that are presented in Ontario.

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### THE TWO ROSSLANDS.

THERE are two Rosslands that are centres of gold districts. The more famous one—that in British Columbia—is the newer, and there low grade ores appear to be very abundant and to promise enormous returns. The older Rossland, after which the Columbian Rossland is not named, is in Ontario, a short distance east of Rat Portage. To both the north and south in this neighborhood there are known to be extremely rich gold veins, properties only yet partially developed, but greater in continuity and of a richer grade of ore than Rossland, B.C., is yet acquainted with. The Ontario Rossland, will probably, become famous before long.

### RUSSIAN GOLD PRODUCTION.

OF great foreign gold mines, those of Russia are not the least in importance. The output is about one-sixth of the total annual production of yellow metal, if the figures for 1895 are taken as a basis of calculation. And this proportion is likely to increase, rather than diminish, unless, as may now be hoped, the phenomenal wealth in gold of the Dominion of Canada is properly appreciated and developed. Not that the gold fields are unusually rich, so far as is yet known, but the enormous stretch of European Russia, and the four or five thousand miles in longitude of Siberia, afford abundant room for gold fields. So far, most of the mining has been placer mining, and in fact nearly all that has been done has been superficial, and done in a primitive way. In a few districts scientific work has been essayed in a modest manner. The Ural district, on both the European and Asiatic sides, is still the leading mining district, and outside of it little has been attempted in the search for gold-bearing veins. Foreign capital, however, is becoming interested, and the rich placers of the region beyond Lake Baikal, on the borders of Mongolia, and the placers also of the Amour river and its tributaries, still further east, are likely to be developed before long, and with modern appliances, and possibly too, on a large scale. Like Canada, Russia has its eastern and western gold districts; the eastern, through the access to much of it available by the Amour river, almost comparable to the St. Lawrence in length of navigation, although handicapped by an arctic rigor in winter; and the western, unlike

our British Columbian districts, very far removed from the ocean, requiring long hauls and very limited access to railway facilities, or the opportunities which water communication such as British Columbia affords. The construction of the Trans-Siberian railway, will, to some extent, improve the prospects of gold mining in the Asiatic portions of the Empire, especially in the Lake Baikal district; but it is a question if the gold fields of the Empire can afford anything like the opportunities that Canada has for successful and economical development of gold mines.

### LAKE OF THE WOODS MINES.

We give a list of gold mines in the Lake of the Woods district and the number of stamps in use at each mine at the end of last year:

The Dominion Gold Mining and Reduction Works.....	20	stamps.
The Foley.....	20	"
The Ferguson.....	20	"
The Sultana.....	10	"
The Regina.....	10	"
The Triumph.....	10	"
The Lyle.....	10	"
The Haycock.....	10	"
The Sawbill.....	10	"
The Lake Harold.....	5	"
The Pine Portage.....	10	"
The Gold Hill.....	10	"

The following is a list of gold mines in the Lake of the Woods district without stamps:

The Golden Gate.	The Britannia.
The Mikado.	The Gull.
The Cornucopia.	The Scramble.
The Jennie Lee.	The Yellow Girl.
The Black Jack.	The Monte Cristo.
The Queen Bee.	The Queen.
The Arnold.	The Standard.

Of the mines mentioned above the Lake Harold is putting in five additional stamps, while the Cornucopia and Scramble mines are about to put in twenty-stamp mills.

THE Gooderham, Blackstock, Cox Syndicate, the *World* says, do not intend erecting a smelter at present, but are interested in a proposed smelter at Northport, just south of the provincial boundary line. Mr. Blackstock expressed the opinion that Canadian smelters will not be erected until the route of the Crow's Nest pass railway is known.

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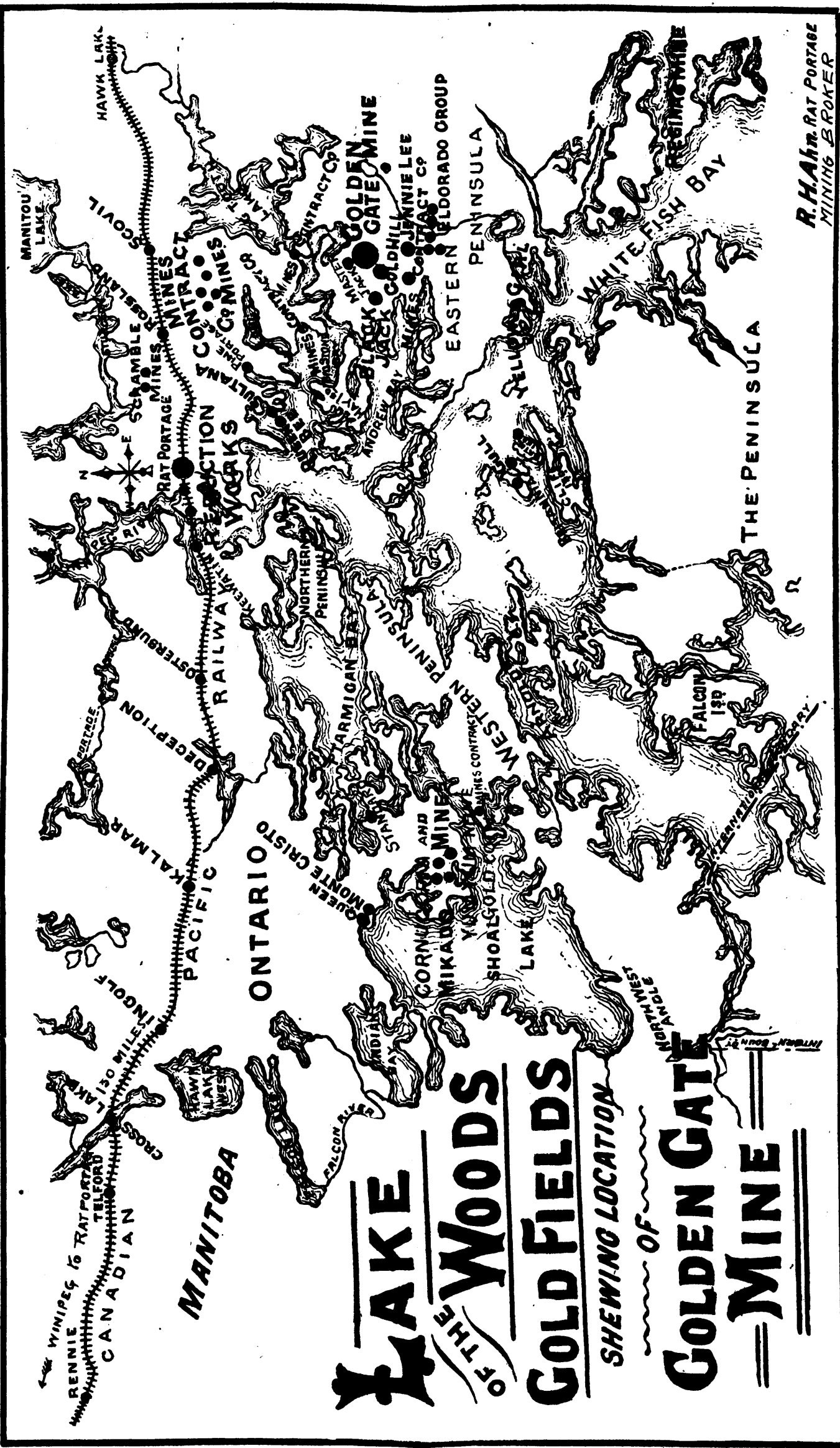
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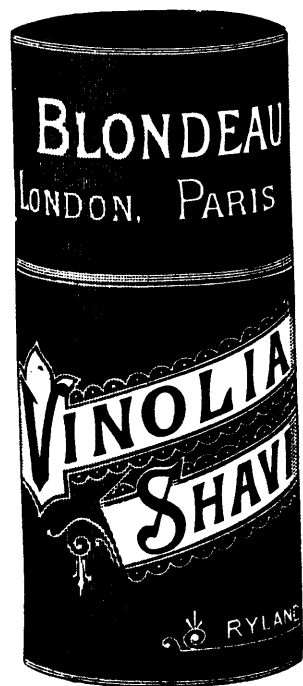
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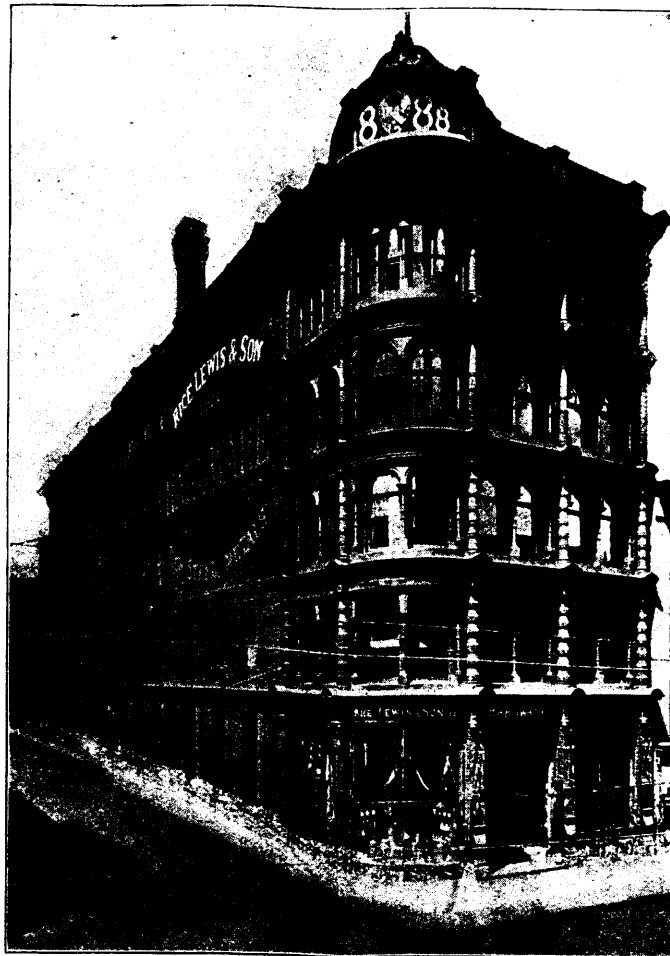


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