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in Review

Canadian

Established 1882

Vol. XV.—No 9

MONTREAL—OTTAWA—HALIFAX.

SEPTEMBER, 1896.

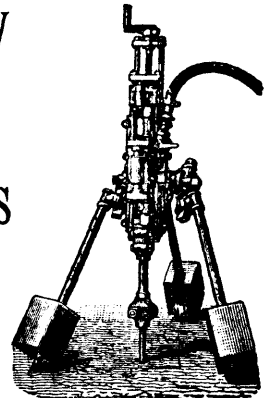
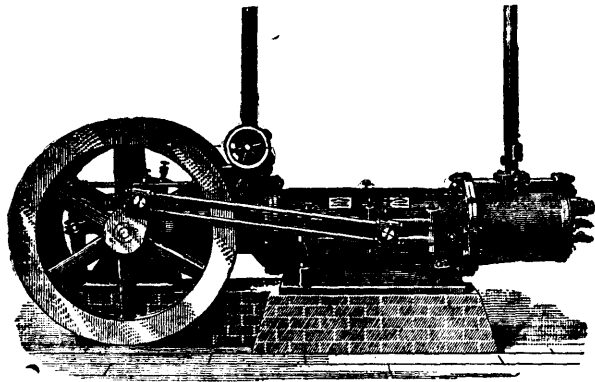
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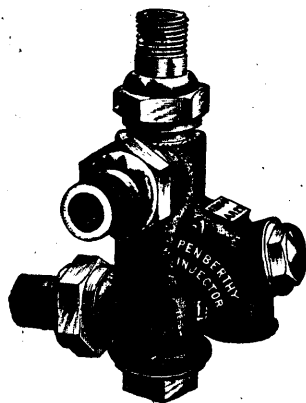
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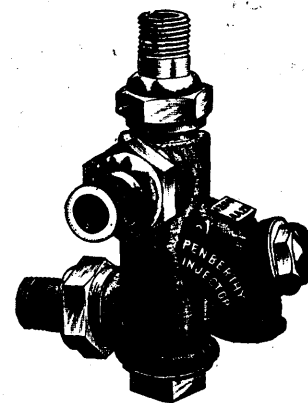


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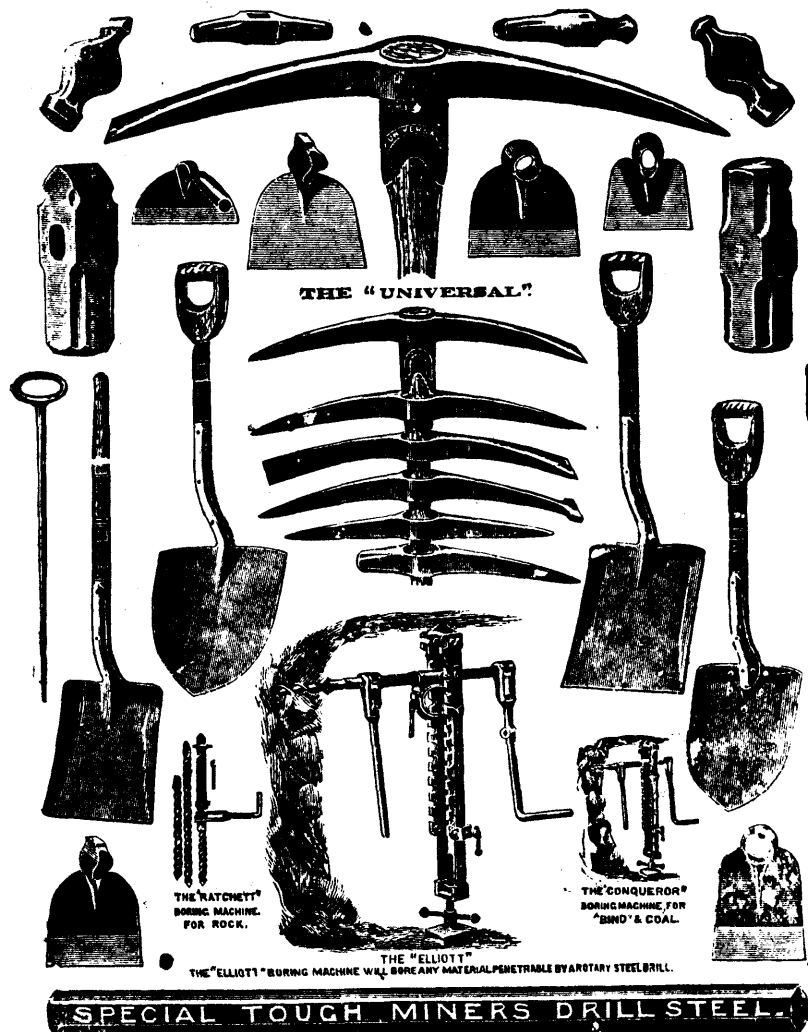
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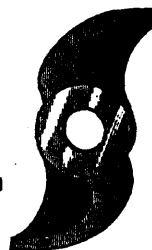
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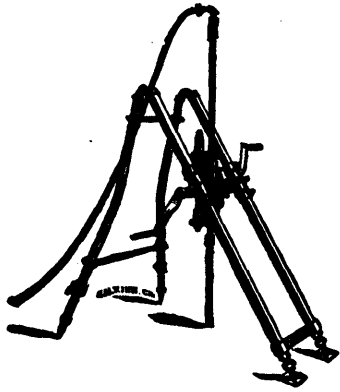
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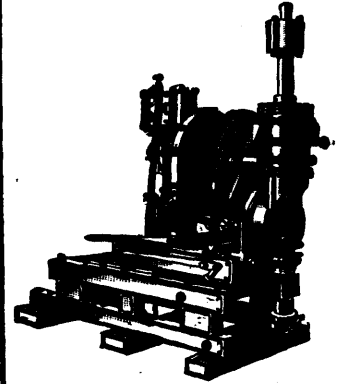
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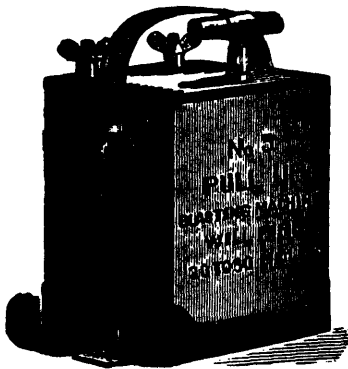
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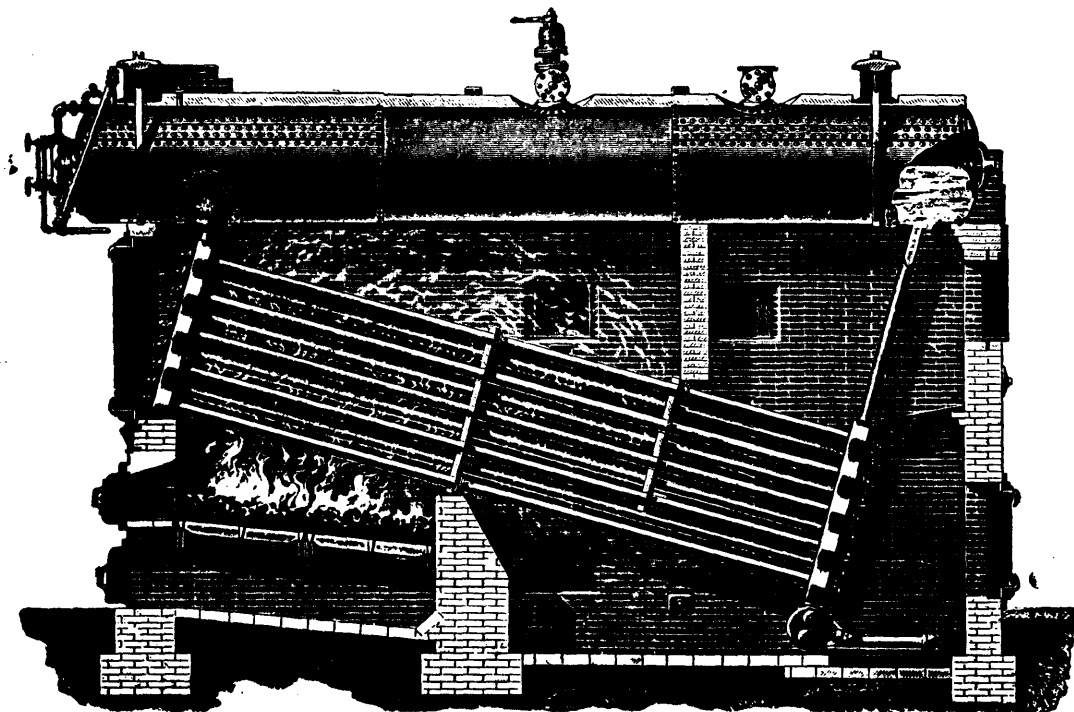
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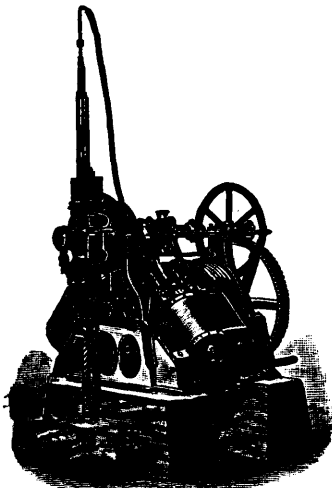
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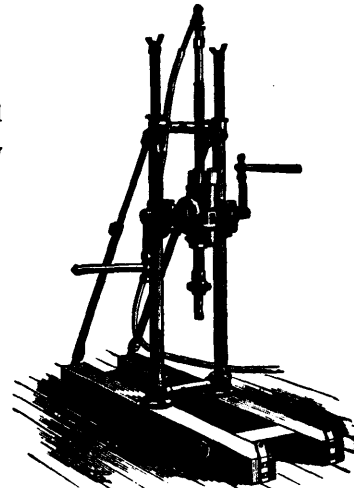
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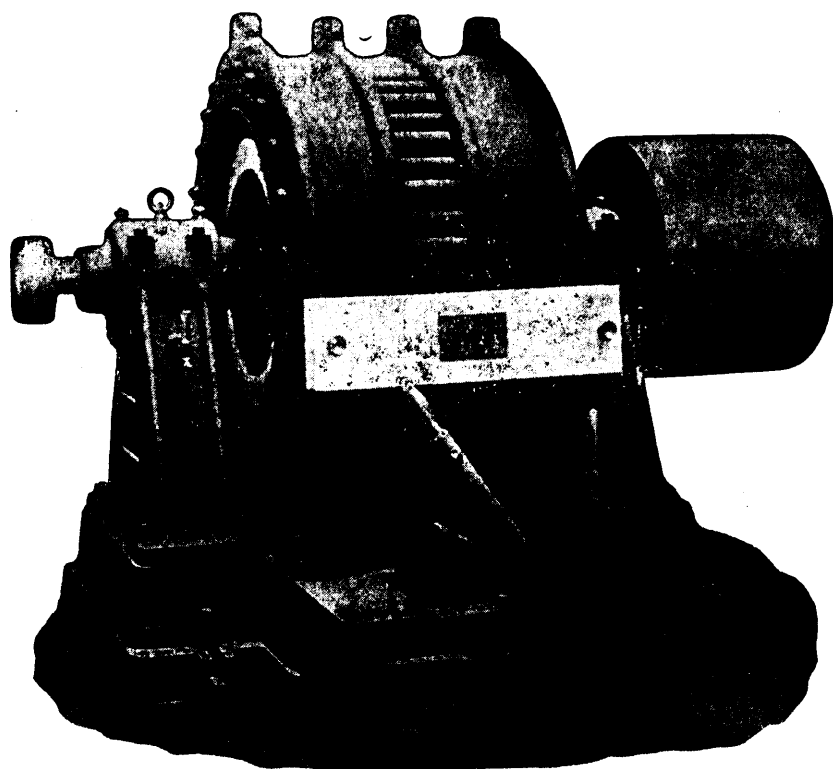
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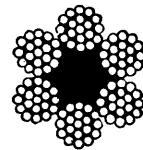
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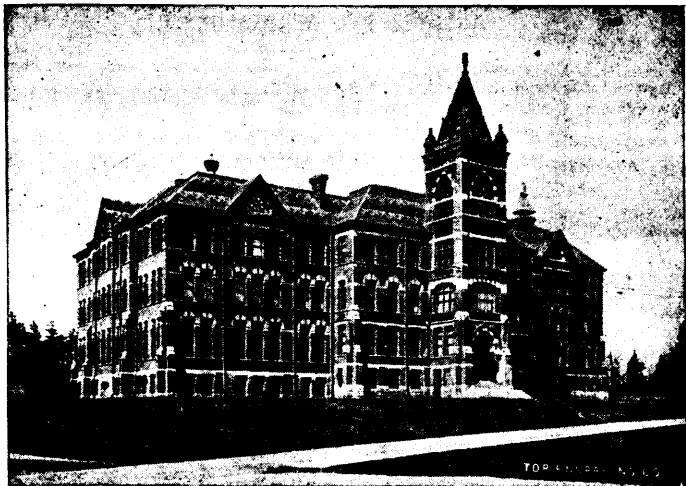
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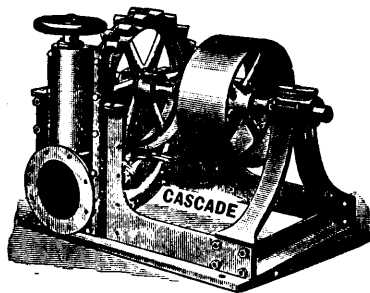
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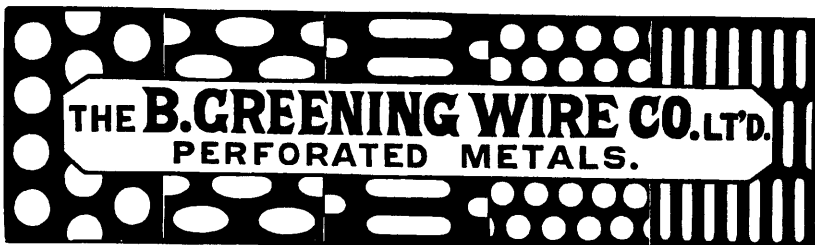
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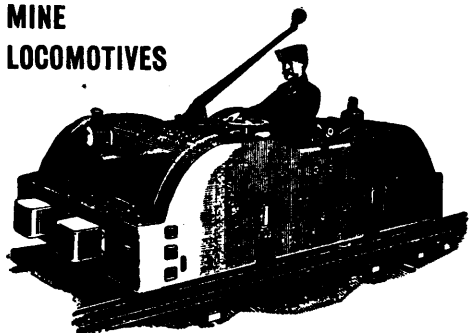
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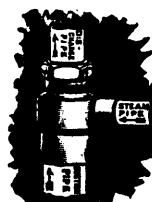
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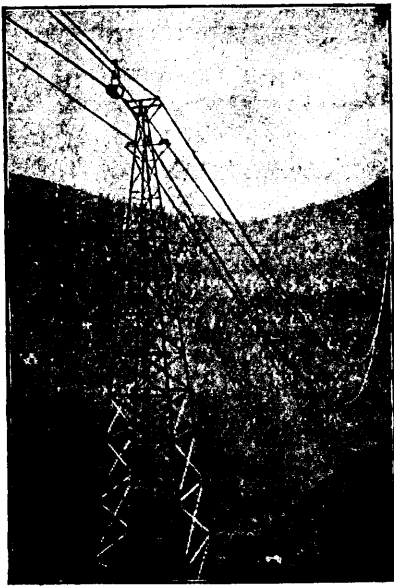
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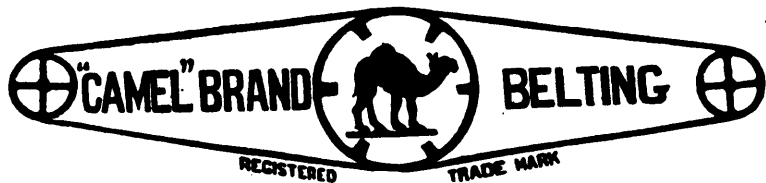
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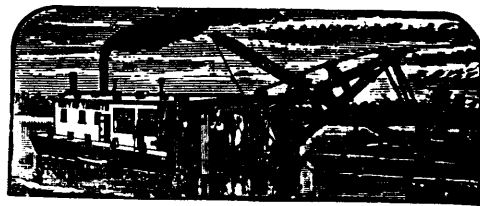
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VOL. XV., No. 9

SEPTEMBER, 1896.

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Gold in Western Ontario.

The daily papers in our eastern cities are so full of half-page advertisements of Rossland mines, none capitalized, of course, under a million, and of highly inflated correspondence from that seat of excitement, that there is a little danger of our slower-paced eastern mining regions being forgotten in the scramble to "get in on the ground floor" two thousand miles away. British Columbia is not the only gold-producing province in the Dominion as one might suppose. There have been years when steady-going Nova Scotian stamp mills have surpassed it in output. Quebec, too, has gold mines of promise, placers, like most of the producing mines of the west; but perhaps, of all the provinces, Ontario has the widest diffusion of gold, for it has been found here and there from Madoc to the Manitoba boundary, a distance of more than nine hundred miles in a straight line, and in its western portion the locations where gold has been proved to exist number hundreds.

East of Port Arthur, however, gold mining locations are only sporadic, and gold mining of any importance is going on at one point only, the Empress mine near Jackfish Bay, north of Lake Superior. This has really scarcely the right to be called a mine up to the present, since its workings amount to little more than open cuts near the top of a hill rising five or six hundred feet above Jackfish Bay. It is proposed, however, to tunnel into the hill, striking the five veins, which are of a bedded and irregular character, two hundred feet below the summit. Perhaps the most complete and smoothly running ten-stamp mill in the province has been at work there for some time in charge of Mr. W. Peters, and though the ore is low-grade and quite refractory, only 45 or 50 per cent. of the gold being free milling, it is stated that a good profit is now being realized on the ore crushed. Hoisting and pumping plant will be unnecessary for a long time to come, if the twenty feet of quartz available at the surface continue at the level of the proposed tunnel, so that mining expenses will be unusually low.

No gold discoveries of great importance are reported as we advance west until the once famous Huronian mine in Moss township is reached. Here, after the expenditure of a large amount of money on a vein of beautiful and rich ore, the difficulty of access and differences of opinion among the owners caused the mine to shut down when comparatively little work had been done. Dr. Selwyn and others have expressed a very high opinion of this property, and it is probable that under better conditions it will again become a producer, though the ore is refractory, containing a large amount of sulphides and a small quantity of tellurides.

The upper waters of the river Seine afford the next point of interest. Mr. H. B. Proudfoot is developing some properties near Reserve Island on the Seine, including veins of considerable size in the greenish variety of granite sometimes called protogine, but sufficient work has not yet been done to determine the real value of the deposits. Work at this point is hampered by the difficulty of getting in supplies, which during the summer have to be brought in by canoe from Savanne, a distance of nearly sixty miles, at a cost of \$3.00 to \$4.00 per hundredweight.

Farther down the Seine is the Sawbill lake mine, most easily reached from Bonheur station on the C. P. R., which is about thirty miles to the northeast. Here, under the management of Mr. F. S. Wiley, a Hamilton company is developing a most promising vein in protogine gneiss or sheared granite of greenish color. The vein is very distinctly walled, can be followed more than a quarter of a mile, and carries the usual sulphides, iron and copper pyrites and galena, with considerable quantities of free gold. A shaft has been sunk to a depth of 90 ft., where the vein is 6 ft. wide, though it is only 4 ft. wide at the surface. It is intended to sink 200 ft and do some drifting to settle the quantity and character of the ore before putting up a mill, certainly a most wise determination.

Still following the river Seine, the Harold lake mine is reached four miles west of Steep Rock lake. Here several veins have been worked and a great variety of associations can be seen. Protogine granite penetrates green Huronian schist and much decomposed yellowish schist is found close by. Veins of quartz are found in all of these country rocks, but varying greatly in the amount of sulphides and of gold carried. A narrow vein at the shore of Lake Harold has proved the richest, many portions of the quartz being spangled with gold. Only a small amount of sinking has been done, but some hundreds of feet of drifting. A five-stamp mill was put up before much development work had been done, and this has been worked intermittently, producing a considerable amount of gold; one week's work of the mill being said to have yielded a brick worth over \$600.

Forty-five miles west of Harold lake the Seine opens out into Shoal lake, between which and Bad Vermillion lake the whole country has been taken up as gold mining locations. The most important of these are found in an area of granite or protogine stretching northeast and southwest between the two lakes. The first gold discoveries were made in this rock, by the Wiegand Brothers less than three years ago, and since then the region has deservedly attracted great attention. There are numerous well defined fissure veins which can be traced half a mile or more and show no diminution in width or gold contents where they have been sunk upon.

The most important property is, of course, that of the Ontario Gold Mines Co., owned by Michigan and New York gentlemen, and generally known as the Foley mine. Mr. R. A. Demme, of Detroit, is president of the company, and Mr. J. C. Foley manager.

Several promising veins occur on the 192 acres owned by the company, but only one, the Bonanza vein, has been developed to any great extent. Here one shaft has been sunk to a depth of 210 feet, another 113 feet; and 325 feet of drifting have been done, proving that the vein is continuous and averages 32 inches wide. The ore averages \$20.00 per ton free-milling with \$5.00 more in the concentrates. A mill of twenty stamps is now being put up, and is amply justified by the quantity of ore in sight.

A considerable amount of development work is being carried out on the property of the Seine River Gold Mines Co of London, under

the management of Mr. A. B. Whiteley, and several of the veins are showing up well, though more sinking is required to settle the final value of the property.

What has been known as the Lucky Coon mine is now in the hands of Edinburgh capitalists who intend to purchase and work it, if on development it continues to look as well at present.

Some work has been done on several other Shoal lake properties, and it is probable that a number of prosperous mines will be operating in a year or two.

Just north of Bad Vermilion lake, in the Little Turtle region, a number of very rich finds have been made, the deposits being bedded veins in green Keewatin schist. As there has been no development work it is hard to estimate the value of the region. In general it displays richer pockets of ore, but smaller and less certain ore-bodies than the Shoal lake district to the south.

What has been said of Little Turtle applies also to the Manitou country, twenty or thirty miles south of Wabigoon on the C. P. R. Exceedingly rich pockets have been found providing attractive specimens, but practically no mining has been done. A Tremaine two stamp prospecting mill has been run for a few days on Little Manitou under the management of Mr. E. B. Haycock, representing an Ottawa company. He states that during a run of seventy hours, eighteen tons of ore were crushed. "job lots" from various veins, averaging about \$25.00 in free gold per ton.

It is probable that when a good road gives easy access this region will be an important gold producer. A custom mill should do well somewhere on the lake.

Turning now to the Lake of the Woods region, which is really the continuation of the gold region so far described, one naturally touches first on the Sultana mine, seven miles south of Rat Portage, owned and worked by Mr. John F. Caldwell. Here large ore bodies, probably lenticular, occur at the edge of an area of porphyritic syenite gneiss. A shaft has been sunk to nearly 300 feet and nearly 1,000 feet of drifting have been done, proving the existence of an immense deposit of quartz, in places 40 feet wide and at least several hundred feet in length. The quartz contains a moderate quantity of sulphides, 1 or 2 per cent., and 75 or 80 per cent. of the gold is free milling.

The stamping capacity of the mill, ten-stamps, will be doubled, and a larger mining plant put in shortly. A chlorination plant which has recently been put up saves most of the gold retained in the concentrates. A weekly gold brick is produced with great regularity, running in value, it is said, from \$1,500 to \$3,000 or more. The pluck and business ability which Mr. Caldwell has shown in developing the Sultana in spite of many discouragements to its present prosperous state deserve the fortune which is already in sight.

The only other property deserving the name of mine on the Lake of the Woods is the Regina, on Whitefish Bay, to the east of the lake. Here a vein beginning in granite of the protogine type and crossing into green Huronian rock has been sunk upon to a depth of 160 feet and 500 feet of drifting has been done. A rich ore chute has been defined in the vein on which most work has been done, running from \$20.00 to \$160.00 per ton; but the gold is very fine and difficult to save in the ten-stamp mill in operation at the mine. Lieutenant-General H. C. Wilkinson is managing director, and Mr. J. Leechman, A.R.S.M., mining engineer, for the English company owning the mine.

A small amount of development is going on at several other points on the Lake of the Woods, e.g., at the Triumph mine, under Mr. C. S. Morris, who has sunk 55 feet and is testing the ore with a two-stamp Tremaine mill; and at the Golden Gate mine near Pine Portage Bay, where sinking is being carried on and ore crushed at the ten-stamp mill belonging to the Gold Hill mine, which is not now working.

The Scramble mine, five miles from Rat Portage, is notable as being located on a fahl band, a wide band of schist strongly impregnated with pyrites, but yet showing a considerable amount of free gold when

panned; and several other properties of a similar character and of promising appearance have been located in the neighborhood, but too little development has been done to determine their real value.

Of the great number of more or less promising "prospects" on the Lake of the Woods no more need be said than that far more work must be done upon them before their gold contents can be settled.

One remarkable ore deposit on Shoal lake, not the expansion of the Seine but a lake of the same name forming part of the boundary between Ontario and Manitoba, is deserving of mention, the Mikado mine. Here a wide ore body occurs in granite of the protogine type near altered diabase of Huronian age. The quartz is heavily charged with sulphides but carries also a quantity of gold in plate-like form. A run of 114 tons of this ore at the Rat Portage Reduction Works is said to have yielded about \$7,000 worth of gold, i.e., at the rate of more than \$60.00 per ton without reckoning the concentrates. The mine is being worked by an English company with Mr. Theo. Breidenbach as manager.

The gold region of Western Ontario is about 200 miles from east to west by 100 in the other direction, but not the whole of this area is auriferous. In general the region consists of larger or smaller areas of so-called Laurentian granitoid gneiss or of eruptive granite, both of which have pushed themselves through the green (Keewatin) schists, generally considered Huronian in age. The contact between the two sets of rocks is always an eruptive one, and the most promising gold deposits have thus far been found within two or three miles of the contact. Many of the veins occur in the green schists, and these are of a bedded and lenticular character, often very rich in gold, but not often forming large ore bodies. The veins in the granite or granitoid gneiss are generally true fissures and more likely to be continuous. It should be added, however, that the best mine in the region, the Sultana, is not on a fissure vein, but probably on a series of great lenses.

Only a small part of the wide-reaching series of contacts of granite with green schists has been explored, but already we have ample proof that gold is widely distributed in the region and at many points in quantities that will pay for working.

When one considers the great advantages of this region it is strange that it has been so slow in developing. Probably, however, this is due to the failure of several early ventures, often badly managed, with insufficient capital and beginning at the wrong end by erecting mills for treating ores which had not been proved to exist in bodies large enough to justify working. Now that one or two mines have passed the critical, experimental stage and proved by their yield that they have a right to exist, we may expect to see gold mining prosper in Western Ontario.

Plenty of pure water, a healthy climate, a region within easy reach of railroads and steamboats, with cheap food supplies and plenty of labor at reasonable rates right at hand, all combine to make this attractive as a gold mining region. Beside this there is the fact that the ores are exceptionally easy of treatment, being largely free-milling, so that a simple stamp mill with chlorination plant to treat concentrates is all that is necessary, instead of the half million outlay for smelting works required in many other countries.

There is no reason why at least some of these gold deposits, like those of certain mines in Nova Scotia, and the Treadwell and other mines in American territory, should not be mined and crushed at a cost of less than \$2.00 per ton when worked on a fairly large scale; and it is probable that a fifty-stamp mill could be readily supplied with ore from such masses of quartz as occur at several points in the province, such as at the Sultana mine.

Mr. Milton L. Hersey, B. A. Sc., a graduate of McGill, who has for some years been associated with the Canadian Pacific Railway in the capacity of assayer, has opened a well equipped mineralogical and testing laboratory in Montreal. Mr. Hersey is a bright and reliable young chemist whom we sincerely wish well in his enterprise.

Coal Dust and Colliery Explosions.

So much has been written within the last twenty-five years on coal dust and colliery explosions that claimants for further honors in this field require to be very careful when stating the grounds for their appeal to fame, and they should not be surprised if they are required to submit their evidence to free criticism and to support it with an array of facts that are acceptable. At the same time if they frankly acknowledge the steps already taken by their predecessors in the inquiry and ask for no large amount of applause for having assimilated the information up to date, they may expect to meet with a more favorable hearing.

When, however, the claims largely partake of positive assertion on points previously suggested by others but held in abeyance pending more confirmatory evidence from observers of accepted caution, the claimants must expect some hesitation to be shown.

And in this class we would put Mr. Donald Stuart, F. G. S., who undertook to reply at the February meeting of the American Institute of Mining Engineers to certain comments made at a previous meeting on his work, "Coal Dust an Explosive Agent." In his reply to the comments of Dr. Day and others, he winds up by patting himself on the back, after the style of one of our native *precis* writers on the Reports of the Geological Survey of Canada, and he does it in this way—"In conclusion I venture to hope that the *rationale* of a colliery explosion, advanced in 'Coal Dust an Explosive Agent,' and developed in 'The Origin and Rationale of Colliery Explosions,' will help to give a grasp of the nature of the danger to be guarded against as will strengthen the hands of all (*sic*) engaged in colliery operations in contending with it, so that, in future, coal supplies may be obtained without the terrible sacrifice of life which explosives have entailed." Could modest omniscience ask for less?

And yet, having claimed something which he says he has discovered in connection with explosives, he fails to lay down rules for the guidance of coal miners that in *all* cases can be applied and will prevent disasters in future. It is unfortunate, however, that the "evidence" on which he relies does not carry conviction to *all* his readers. Take, for instance, the following:—Dr. Day remarked, "The only evidence of the absence of carbon dioxide (from the after-damp) is the fact that there was not enough to extinguish the lights of the exploring party, several hours after the explosion." Mr. Stuart replies, this is "a mis-apprehension. It will be found at page 62 of my book that four men in the new branch escaped and in doing so attempted (*sic*) to pass through over 150 yards of road in which explosions 8, 9 and 10 had occurred, and where the products of the explosions were imprisoned by the falls. They were in the stagnant atmosphere almost immediately after the disaster and their candles burned brightly in it." An *attempt* to enter after-damp is not evidence that had an entrance for some distance been made the gases would have supported life, and had Mr. Stuart had personal experience he would have known that fresh falls are seldom or never air-tight, a diffusion readily takes place through them, and this ahead of the detectable current of air.

That after-damp may be "suffocating, pungent and irritating" is not a new experience, and explorers after previous explosions have in some cases noted and recorded that their lamps would burn in an atmosphere largely composed of after-damp, so that in these respects Mr. Stuart has made no new discovery. Nor is he the first to offer a possible solution of lamps continuing to burn in an atmosphere containing after-damp. We spoke of this in our last issue in connection with a recent paper on the subject from the pen of Professor Hall. In spite of his explanation we must continue to deem his evidence defective and to regard Dr. Day's remarks as more consistent with the chemical knowledge of today. Dr. Day said: "Mr. Stuart ventures the statement that carbon dioxide is an essential product of the explosion of hydro-carbon gases, although it is well known that these products may vary from water and carbon dioxide as products of complete com-

bustion to mixtures in various proportions of hydrogen, solid hydro-carbon mixed with free carbon (soot), unburnt gaseous hydro-carbons, carbon in the form of coke, carbon monoxide, carbon dioxide, water, etc., according to the stage of incompleteness of the combustion." Mr. Stuart in reply gives what he calls evidence, but which is largely assumption on his part; witness the following:—"But if these proportions (for a complete combustion of hydro-carbon, gas and atmospheric oxygen) be departed from, then as their ratio from complete combustion disappears, the violent effects of the mixtures diminish until a point of incomplete combustion is reached in which no disruptive force is produced;" and elsewhere: "disruptive effects could only be produced by the explosion or practically complete combustion of the gas." In these comments Mr. Stuart shows a want of knowledge of the conclusive experiments by Dr. Thorpe and Mr. Shaw, who demonstrated to the one hundredth of a per cent. the point in a mixture of air and certain hydro-carbons when simple combustion ceased and explosion began. The lines are found to be sharp and distinct, though varying with the hydro-carbon used, but within the limits of explosion the percentage of hydro-carbon could vary some eight per cent.; and consequently the products of the explosions varied proportionately, though the violence of the explosion was immaterially changed.

Mr. Stuart claims to have proved by the explosions he discusses that coal dust alone is sufficient to occasion disasters, and that the Royal Commission erred in hesitating to accept this theory. That the cases he mentions are strong presumptive evidence must be admitted, but so were the practical experiments conducted by Inspector Hall—to which, by the way, Mr. Stuart makes no reference—and yet the Royal Commission thought it better to bring in a Scotch verdict of non-proven even with his evidence before them. In bringing before the public the details of the explosions at Camerton and Timsbury in Somersetshire, where the presence of inflammable gas is said never to have been detected by the safety lamp, Mr. Stuart has done good service, and the pains he has taken to collect data are worthy of all praise. And further, as he has carefully kept separate his record of facts from his conclusions, any difference of opinion regarding the latter that may be held do not mar the former, and we therefore can confidently recommend his works to students of the subject.

Silver Mining in Kootenay, B.C.

Silver mining in British Columbia is practically confined to the Kootenay districts, and of these two great districts nearly the whole production so far has been from West Kootenay. From this district of West Kootenay there has been shipped during the past five years upwards of 20,000 tons of high grade silver ore, not including 3,200 tons of bullion produced by the Pilot Bay smelter during 1895, nor the shipments of this present year, which are largely on the increase owing to the operations of newly built concentrators and the Hall mines smelter.

The productive life of the Kootenay extends only over the past six years, and of this short time a great deal has been under great disadvantage for want of transporting facilities, and the ore might be left untouched to-day if it had not been rich enough to pay the expense of packing great distances over rough roads.

Railroads will come into a district after it has demonstrated by its shipments packed on animals' backs that the ore is there, and of a paying quality. Their extension has been rapid, but the needs of mining camps increase with equal or greater rapidity, with the result that many districts which will ultimately eclipse the present producers have to wait, since the ores, although of large body, will not pay for such costly transportation as is necessary, amounting in many places to from \$10 to \$50 per ton before reaching cars.

The two great districts of East and West Kootenay are further subdivided into recording divisions, each division having a more or less central point at which a Government office is established. Through

the medium of these offices nearly all the transactions relative to mining properties have to pass.

In order to understand more definitely what is being done in the silver mining districts these divisions may be taken separately, and the peculiarities and state of development of each one be noted—that is, in the case of the more important producing divisions. East Kootenay as a silver mining district may be taken as a whole, considering the state of its present development.

Of the divisions of West Kootenay the four leading silver producers are Slocan, Ainsworth, Nelson and Kaslo. Trout Lake mining division, Illecillewaet, Lardeau and Caribou Creek are coming producers and are actively developing their prospects and building trails and roads.

These statements all refer to silver mining.

EAST KOOTENAY DISTRICT

This district was first explored for minerals as a placer camp, as is usual with most camps which ultimately turn to quartz mining or solid rock work.

After the placer camps at Galbraith's Ferry in 1864, little was done until Major Steele came in from the Northwest in 1887 and established Fort Steele.

Since that time many large deposits of argentiferous galena have been located, more especially in that portion west of the Columbia which is drained by the St. Mary's and Moyie rivers. Chief amongst these are the North Star, 20 miles north-west of Fort Steele, and Sullivan groups, also the St. Eugenie on Moyie lake, and the Dibblo group in the Rocky mountains. Of these ore bodies, the North Star is at present the only active producer.

This mine has been making an output of about 30 tons of picked galena per day during the past season. This ore is taken overland to the Columbia river, by sleighs or waggons, and from thence goes down the Kootenay river to Jennings, Montana, at which point the ore is shipped *via* the Great Northern Railway. Other mines have made sample shipments, but apparently at the present time the ore bodies cannot bear this high transportation charge.

A waggon road connects Fort Steele and Golden on the C. P. R., a distance of 160 miles, also a more or less effective water route *via* the Upper Columbia river.

With points on the Great Northern there are fair transportation facilities down the Kootenay river, boats being run up and down by the Upper Kootenay Navigation Company, which has a contract to bring down 5,000 tons of North Star ore to Jennings, Montana.

This district is composed of five divisions, in which more or less development is going on, principally, however, in gold quartz and placer mining, with the exception of Fort Steele division, which promises more for a silver-lead camp. The chief silver bearing minerals of this district are, as usual, galena and copper combinations. The galena is in large bodies, but of somewhat lower grade than that of many West Kootenay camps.

It may be seen on a map of this district that the St. Mary's river, Perry creek and Moyie river country stretches westward across the Purcell range and finally meets the ore-bearing region draining down into Kootenay lake, including the White Grouse mountains, which are now attracting considerable attention.

When the much-hoped for Crow's Nest railroad comes through, East Kootenay will be one of the earliest and most benefited regions. It has abundance of coking coal within easy distance, together with iron and limestone suitable for fluxes. Then, like many another waiting camp, it will no doubt outshine the present chief producers.

WEST KOOTENAY.

Under the head division of Revelstoke there are in the north part of West Kootenay the sub-divisions Illecillewaet, Lardeau and Trout lake, all of which have valuable deposits of more or less low-grade silver

ores, together with some smaller bodies of exceedingly high-grade combinations. In the Illecillewaet and Lardeau only the ordinary development of non-shipping camps has gone on during the past year, together with some important transfers.

TROUT LAKE MINING DIVISION.

This is also a camp which owes its origin to placer mining, a little of which is still carried on in winter.

Trout lake is situated 12 miles east of the north-east arm of the Upper Arrow lake, and is reached by a good waggon road which crosses the summit through a low, wide pass, less than 1,000 ft. above Upper Arrow lake, and 4 miles west of Trout lake; from this point the drainage is eastwards, and thence south down the Lardeau river to the Duncan river and Kootenay lake.

This low pass will possibly be one way for all-rail communication from Revelstoke to Kootenay lake, as suggested by Dr. Dawson in his report upon this district in 1889. At present, however, the means of transportation are expensive, as may be judged from shipments of the "Silver Cup" during last winter, the only shipments of any account from this division. The ore from this mine was "raw-hided" over the range to Trout lake, from there by open boat to the waggon road, thence 12 miles by sleighs to Thompson's landing on the north-east arm of Arrow lake, again by boat to the C. P. R. at Arrowhead.

Such shipments as these are expensive, but they are the means of making a producing camp and carry more weight than much newspaper "booming."

In this division,—upon the mountains north of the low divide, there are great bodies of low-grade argentiferous galena, and further northwards still along the contact of a great band of crystalline limestone, and the prevailing schists there are combinations of galena, zinc blende and gray copper, which carry from 200 ozs. to 2,000 ozs silver per ton.

These richer locations are too much out of the way for present shipping, although good pack trails have been built and a waggon road is now in progress. This particular district seems to have a greater fall of snow and rain than other portions of West Kootenay, and many of the locations are among snow-slides for a considerable portion of the year, especially those about the head waters of the Duncan and Lardeau rivers.

This division claims some of the largest bodies of galena in West Kootenay, but these must lie idle until further railroad development takes place.

In connection with the very apparent influence of country rock upon mineral combinations in this district, it may be of interest to note that this portion of the country is overlain by great bands of stratified rock, singularly regular in its strike and dip, considering the broken state of the ranges further southward.

These rocks are chiefly composed of fine mica schists, more or less calcareous, and chloritic schists and massive limestone, with serpentine in places. The strike is north-westerly. A chart of this country showing the mining claims at once indicates a conformation of the principal veins with the banding of the rock, such a strong conformation that groups of a score of claims are located in one long line. This is especially true of the contact of the massive limestone and schist.

For the condition of development this division has had a considerable number of bonds and sales during the past.

Prospecting is more active this summer than previously.

The number of claims recorded as located during 1895 was 75; bills of sale, 38.

AINSWORTH DIVISION.

This is the oldest camp of West Kootenay and was the first producer of ore, locations having been made in 1883. Previous to this the great deposit of ore now being worked for the Pilot Bay smelter was

known and acquired but not worked. It was from this camp that the stampede for the Slocan to the north-westward took place in the fall of 1891.

Good transportation is afforded by means of Kootenay lake, and the presence of the Pilot Bay smelter just across the lake, has greatly stimulated development and production during the past 18 months. The ores, excepting some large bodies of low grade galena, zinc blende and pyrites such as the Blue Bell and the Canadian Pacific Mining Co's mines at Woodberry are chiefly dry ores, composed mainly of argentite, copper combinations and argentiferous iron pyrites together with some native silver and ruby silver.

These dry ores are a few miles back from the lake in metamorphic rocks close to the contact of the great granite area which lies to the west of Kootenay lake. They appear under much the same conditions and combinations as in other contact zones, such as are in the Slocan.

Waggon roads lead up from the lake to the mines of which there are about ten which have made shipments, the chief of which are the "Skyline" and "No 1."

At present the production is steadily increasing. During 1895 3,533 tons were shipped of which most was treated at the Pilot Bay smelter.

This smelter, pending a transfer, has during this present season, since May, been shut down and shipments are being made to Everett and other American smelters.

Concentrators are run in connection with the "Blue Bell" mine, and one of 50 tons capacity at the "No 1" mine.

The Canadian Pacific Mining Co. on Woodberry creek, has put in a flume and will build a concentrator for their ores.

The pay streaks of the dry ore camp are often pockety as is also the case with the Slocan dry ores. The mineral belt does not appear to be of very great extent, being practically confined to within six or seven miles of the lake. Prospectors during the present season have pretty well run over all the ground between this camp and the dry ore camps east of Slocan lake, without finding very much ore so far, although the granites further westwards, six or seven miles east from Slocan lake have exceedingly rich deposits of dry ore.

A new camp has been opened up within the past few weeks some 15 miles eastwards of Kootenay lake. This is the White Grouse country which drains into the St. Marys river of East Kootenay, and also westwards by Granite creek into Kootenay lake, 20 miles south of Pilot Bay. A Montana company has bonded eleven claims in this country and are pushing development on the claims chief of which is the "Storm King," and are also building a 15 mile waggon road from the new town called Sanca at the mouth of Granite creek. The ores carry a good deal of copper in different forms. No shipments can yet be made.

The Pilot Bay smelter, pioneer of bullion producing in Kootenay, began operations in March 1895, and produced in that year 3,220 tons of silver-lead bullion.

During the year there were mined, chiefly from the "Blue Bell" 52,000 tons of ore which was concentrated before being smelted.

This smelter ran almost entirely upon ores mined by the same company, custom smelting to the amount of 2,500 tons only being done. 200 men were employed and something like three quarters of a million dollars have been expended since the operations began in 1894, until the present time. This smelter has been closed down since early in June, under the statement that reduction works were about to be added. At present writing this report has changed to the announcement that the Kansas City Smelting Co. together with the C. P. R. Co. have purchased it and will put in additional capacity with the special object of custom smelting.

The number of claims recorded in Ainsworth division in 1895 was 410 and the number of transfers 384.

NELSON MINING DIVISION.

The chief silver-producing portion of this division consists of a body of isolated metamorphic rock, some three or four miles south of Nelson. It was in these rocks, which are placed by Dr. Dawson in his Report of 1889 as of the Adams lake series, that the first great discoveries of argentiferous copper ores were made. This was in the year 1886 at a time when West Kootenay was a wilderness. Desultory work was carried on in different parts of Toad mountain for the next seven years and some small shipments made at great cost. The work done on the "Silver King" proved both its richness and its permanence, so that a strong and capable company took hold of this mine and its adjacent claims.

After this transfer, the history of silver mining in Nelson division is practically the history of the Hall Mines Company.

Having proved the extent of the ore bodies to be of sufficient greatness, the company contracted for a Hallidie wire rope tramway, and began the construction of a 100-ton capacity smelter. The tramway and smelter were both in running order by the 1st of February.

Some trouble was at first occasioned by the length of the tramway, —4½ miles—and it became necessary, later on, to make a station about half way. The capacity of the tramway is 10 tons an hour, and that of the smelter was to be 100 tons a day. The nature of the ore and able management have made it possible to run through about 120 tons a day, one week's run averaging 145 tons.

The furnace is a Fraser & Chalmers water jacket, 42 in. by 100 in. at the tuyeres and 12 ft. high from tuyeres to feed floor.

The fluxes used are a fine crystalline limestone, and much oxidized iron ore from the "Iron Hand" mine up Kaslo creek.

Coke has been imported from Swansea. The resulting matte is a close-textured product, a concentration of from 7 to 1 to 10 to 1, according to class of ore. This matte carries over 40 per cent. copper, and has a value, as taken from shipments chronicled in the *Nelson Tribune*, of from \$200 to \$300.

During the time since first blowing-in there has been only one stop of any length; this was for two weeks, for necessary repairs.

During the past 12 weeks about 900 tons of matte have been produced, or an average of 75 tons a week.

The mine itself is in a great band of mineralized matter, the chief constituents of which are copper pyrites, peacock copper and gray copper—a very beautiful ore, and, judging from the price of the stock, a very productive one. It is understood that increased capacity is in contemplation for the output of the Hall mines, both for transportation of the "Silver King" mine ores, and in the smelter, for the treatment of ores needing preliminary roasting, and for custom smelting. The "Silver King" ores need no roasting.

As before said, there is but little silver production besides that of the Hall mines in this division. Considerable gold exists and has been won to some extent.

The number of claims recorded in 1895 was 403; number of transfers, 143.

SLOCAN MINING DIVISION.

This great division, taken as a known mineralized area, lies between Slocan lake and river and the Kootenay lakes, chiefly west of the summit. A broad valley of an easy grade runs northward from the Kootenay river at a point 12 miles east of the Columbia. This valley formed an easy route for Indians and early explorers in times past, but it was not until the summer of 1891 that prospectors first found and located Slocan galenas, although there is evidence, drawn from the presence of wooden instruments and wedges, that the Indians had worked at some of the galena bodies near Slocan lake in former times.

On Sept. 9th, 1891, Eli Carpenter and John L. Seaton located the "Payne," one of the present producers. Their report and high assays caused a rush from the Lower Kootenay lake country. Before December that year, amid great hardships, the best belt of the Slocan mines was

staked out, giving a total of 140 claims located before January 1st, 1892. Shipments in small lots were made over thirty miles of rough country by pack and waggon road. By January 1st, 1893, 1,000 tons of ore had gone out in this manner.

During the next summer the fall in silver took place; nevertheless over 3,000 tons were shipped by the same crude transportation. In July of this year the Nakusp and Slocan Railway began its 28-mile road to Three Forks, from Nakusp on the Arrow lakes. It was completed in October, 1894.

During the winter of 1894, an American company having taken over the mines of the Twin lakes basin, built a 100-ton concentrator, hauling their ore some five miles down the mountains by sleighs. During this year some 6,000 tons were shipped. With the spring of 1895 increased development was rapidly undertaken. The Kaslo and Slocan Railway pushed in from Kaslo on Kootenay lake, past Bear lake and Three Forks, up to Cody creek, right into the heart of the mines. Also the Nakusp and Slocan railway pushed on to Sandon. Besides this waggon roads were built up to the Slocan Star and the Washington basin. Concentrators and tramways were built for these two mines, also a tramway for the Alamo and Idaho mines.

These tramways are all on the three-rail gravity car system, and the concentrators save by means of Harty and Collam jigs and revolving slime tables.

During 1895 8,107 tons of Slocan ore were shipped. All this ore is given a customs valuation of \$100 a ton.

During 1896 the production will be greatly increased owing to the completion of the before mentioned railroads, waggon roads and concentrators, the Slocan Star alone contracting to furnish during 1896 more ore than has yet been produced by all the mines in any one year. This is 10,000 tons, 3,000 picked ore and 7,000 concentrates. There has been, it will be seen, a steady conservative development, in many cases by the original locators themselves, men who have to build up their output upon their output, and necessarily have to go ahead slowly.

Moreover, this camp, unlike that of Rosland, has but moderate means of accessibility; usually the mines are some mile or so up the mountain sides, where the only means of transportation for a light equipment is by packing or raw-hiding. Some 34 mines shipped during last winter; excepting some half dozen, all these rawhided their ore down steep trails, a ton to a horse, costing from \$1 to \$5 a ton, whereas packing in summer costs six or seven times as much. Hence it will be seen that no great production can be expected from these small mines during summer until waggon roads, tramways and concentrators are built—the latter to treat the large amount of culled ore rejected as too poor to stand heavy transportation and smelting charges, that is ore more or less under \$100 a ton in value.

The following is a nearly complete list of the producing mines during the year 1895, and their tonnage, all of which has a nominal value of \$100 a ton:—

Slocan Star.....	3,149	Antoine.....	50
Idaho.....	1,159	Dardanelles.....	44
Alamo.....	1,169	Surprise.....	215
Slocan Milling Co....	45	Goodenough.....	76
Cumberland.....	233	Jennie Lind.....	20
Alpha.....	284	Northern Belle.....	16
Payne Group.....	264	Slocan Boy.....	16
Noble Five Group....	535	Yakima.....	20
Reco.....	251	Sovereign.....	15
Bluebird.....	95	Minnesota Silver Co..	15
Mountain Chief.....	46	R. E. Lee.....	41
Last Chance.....	35	Cariboo.....	41
Deadman.....	36	Howard Fraction.....	7
Wellington.....	82	Exchange.....	5
Eureka.....	34		

This gives a total of 8124 tons, valued at \$812,400.00 for the Slocan division alone.

Also the following list of dividend payers has been made up by J. C. Ryan of the Antoine mine. The figures have met with general acceptance in the local papers. They are for the first six months of 1896. He gives only Slocan mines. In some cases the estimates are low, as in the case of the Slocan Star, which mine expended \$125,000 on mill and other improvements in addition to its \$100,000 dividend. The gross earnings are placed at \$1,500,000, the net earnings he places at \$515,500.—(*Vancouver World*.)

Slocan Star.....	\$100,000
Ruth.....	25,000
Reco.....	30,000
Goodenough.....	20,000
White Water.....	40,000
Wellington.....	40,000
Last Chance.....	25,000
Monitor.....	20,000
Idaho Group.....	125,000
Northern Belle.....	20,000
Payne Group.....	20,000
Slocan Boy.....	4,000
R. E. Lee.....	10,000
American Boy.....	4,500
Antoine.....	12,000
Deadman.....	20,000
Total.....	\$515,500

With the dividend of Sept. 1st, the Slocan Star has paid \$250,000. This amount cleared over the heavy expenses of mine, mill and tramway, equals half the capitalization.

The foregoing is what has been *done* in the Slocan, and it is safe to say that its steady productiveness is still going on.

Waggon roads are being built this summer to the Ruth, White Water, Northern Belle and Enterprise. The new company having control of the Noble Five mines are about to build a concentrator and tramway, the contract for such being already let.

Unlike the gold and copper camp of Trail, there has been but little stocking of companies in the open market; nearly every mine is held by a few owners or by a close corporation.

There has been a tendency during the present season to buy up or bond likely properties and to stock them, but no great advance has been made so far.

Nearly all the ores produced are shipped to the States. Omaha, Pueblo, and Everett are the chief buyers.

Pilot Bay smelter has treated very little Slocan ore. It is probable however, that its custom smelting capacity will be largely increased, also that of the Hall mines smelter.

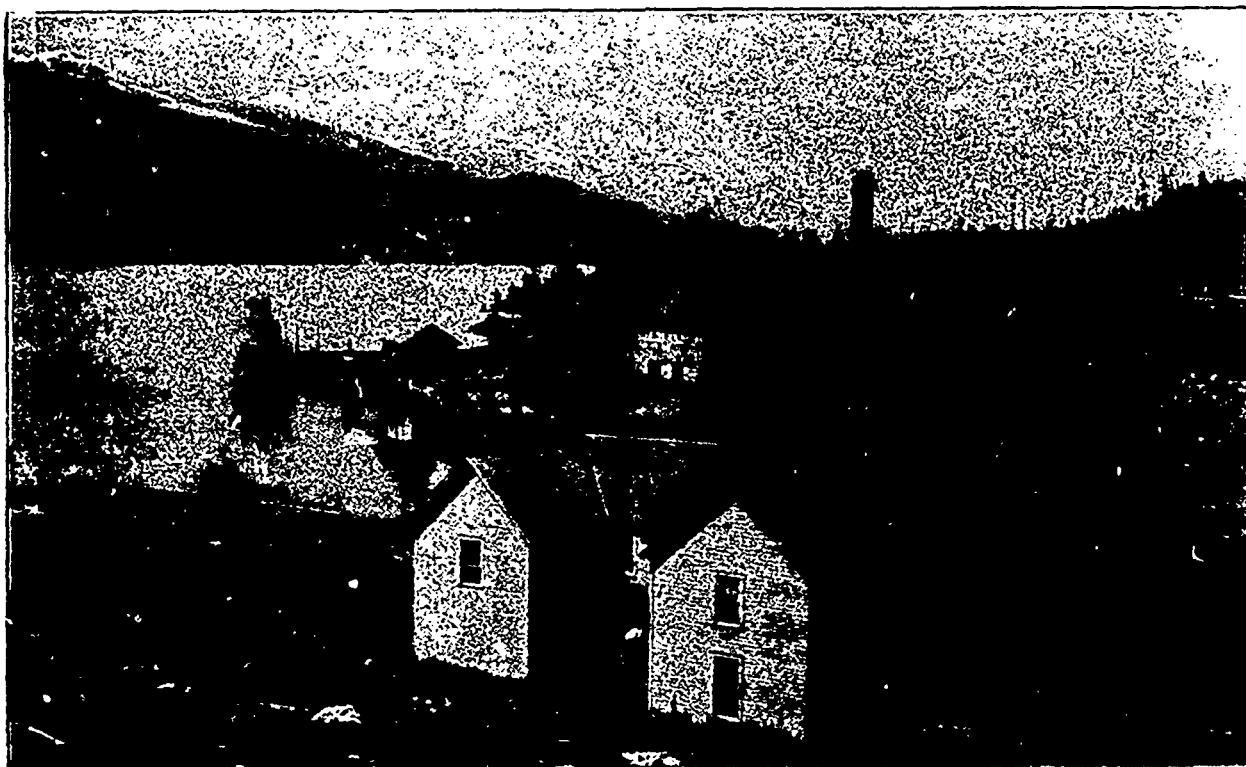
The ores are mainly argentiferous galena, with considerable zinc, and grey copper in some of the richer ore bodies. These galena ores occur in an upper series of impure limestones called by McConnell the "Slocan series." They appear to be exceptionally favorable for high-grade ores. Nearly surrounding these Slocan slates and limestones is a great body of granite. This carries dry ores of zinc blende argentite, ruby silver, grey copper, native silver and gold, and argentiferous pyrites.

The high-grade Slocan galenas are the back-bone and dependency of the district, being of great body and wide distribution. The dry ores often exceedingly rich in silver and gold may become very useful in making a good smelting ore, but these latter are of later finding and development, and their extent is not yet proved.

At present the outlet for the Slocan mines is a choice of two ways each of which carries the ore upon a short railroad of 30 miles or so, thence by steamboat, either up the Arrow lakes to the C. P. R., or down Kootenay lake to the States. The simplest all-rail route out of this camp appears to be down the wide valley of the Slocan lake and river, thence to local smelters and refineries or to points in the United States. A survey of this route is now being carried on under the C. P. R. Co.



Hall Mines Smelting Works, Nelson, B.C.



New Works of the Kootenay Mining and Smelting Co. at Pilot Bay, B.C.

Ontario Mining Institute.

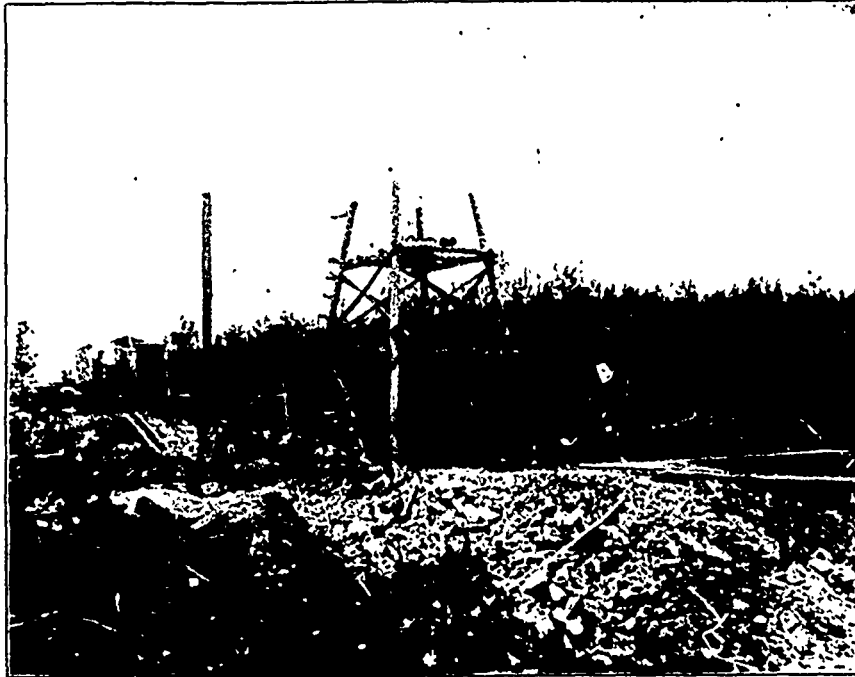
A Group on the Steamer 'Van Horne,' en route for Sultana Mines.



Dr. A. P. Coleman. — Mr. Musgrove.
Mayor Barnes. Dr. Musgrove. V. H. Ashdown.
B. T. A. Bell.



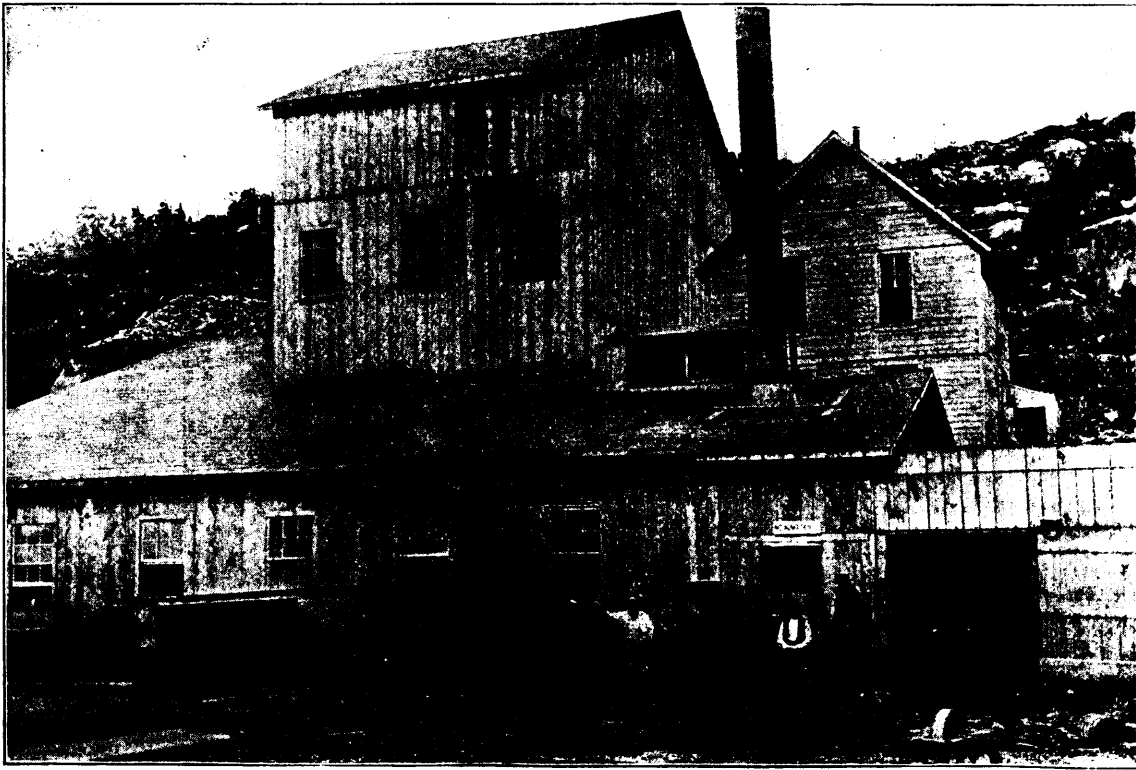
Mountain Chief Silver Mine, B.C.



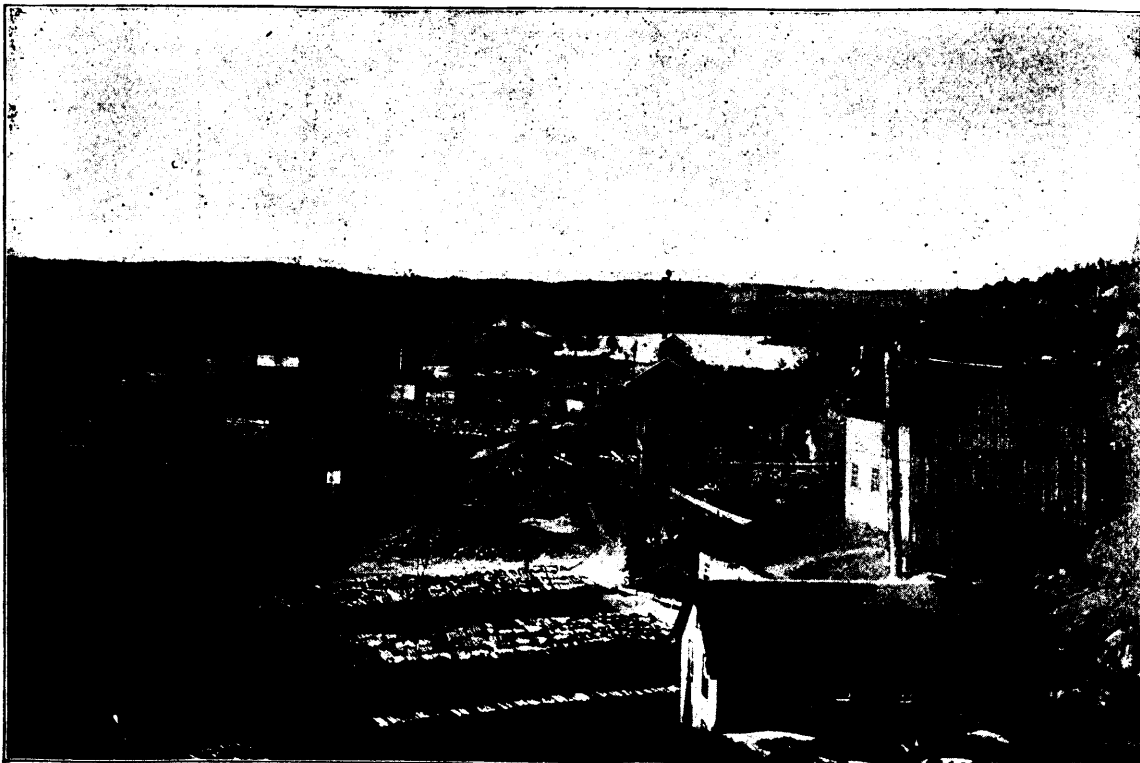
Shaft House in course of construction at Saw Bill Lake Mine, Ont.



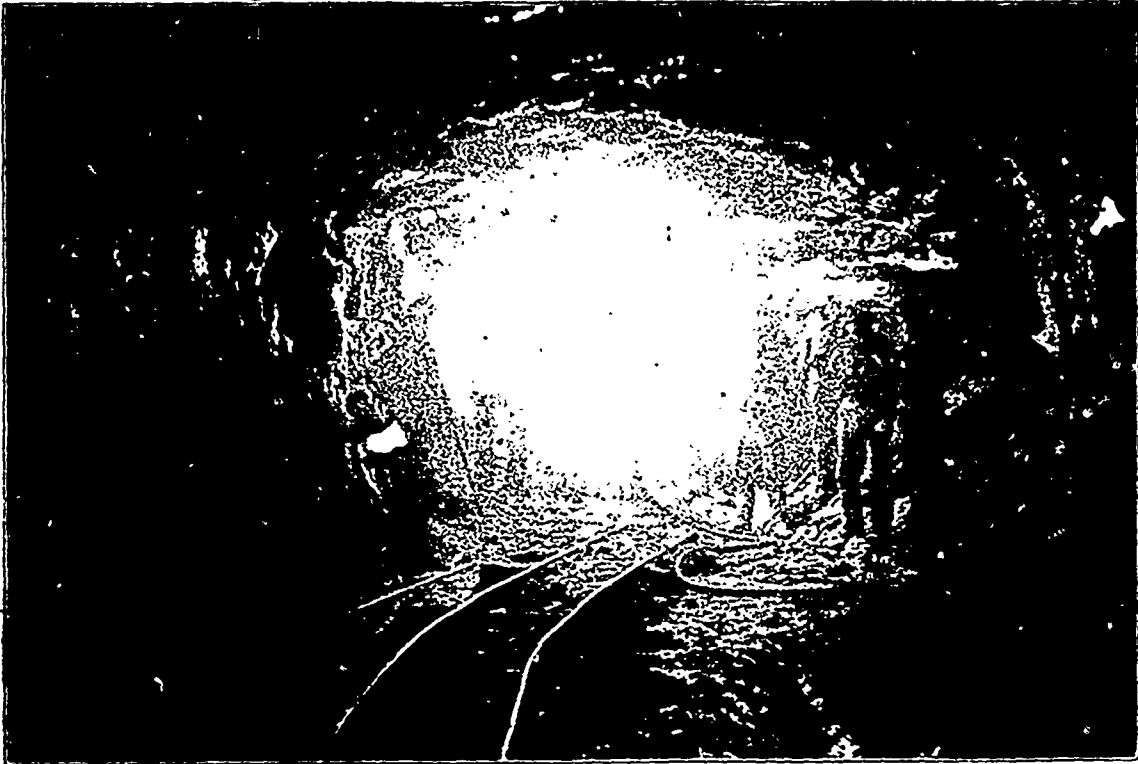
Outcrop of Vein, Saw Bill Lake Mine.



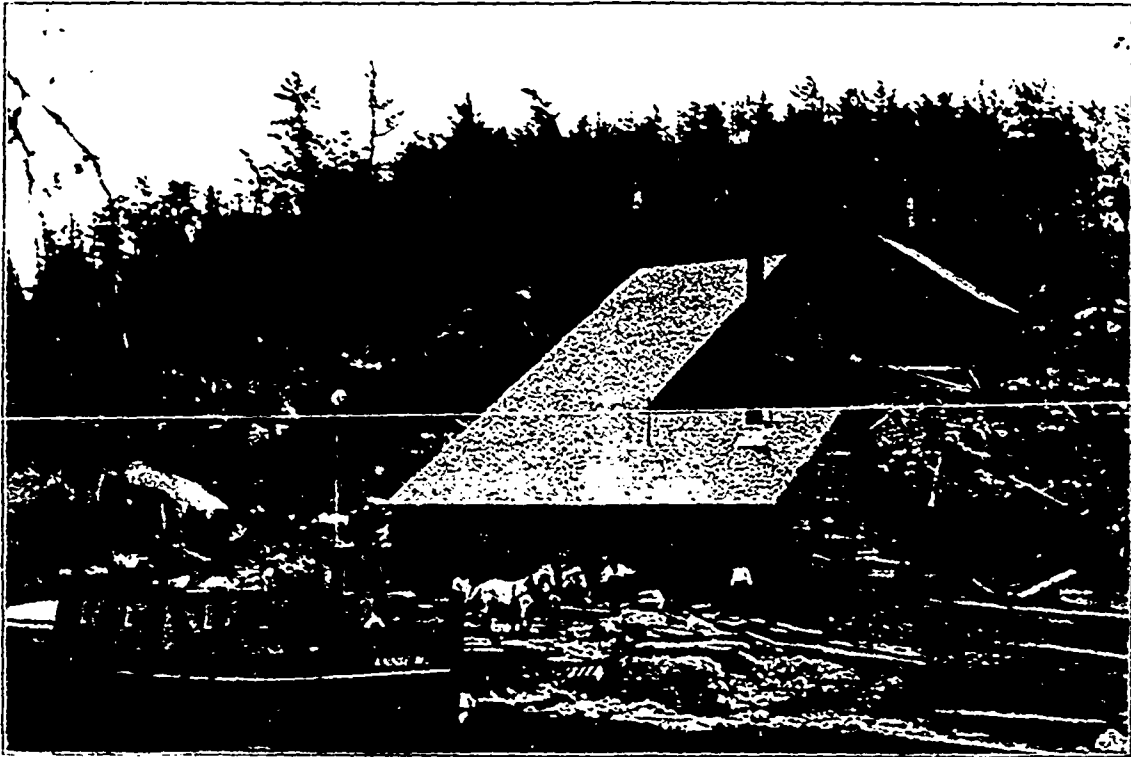
10 Stamp Mill at Sultana Mine.



View of Surface Works, Sultana Mine.



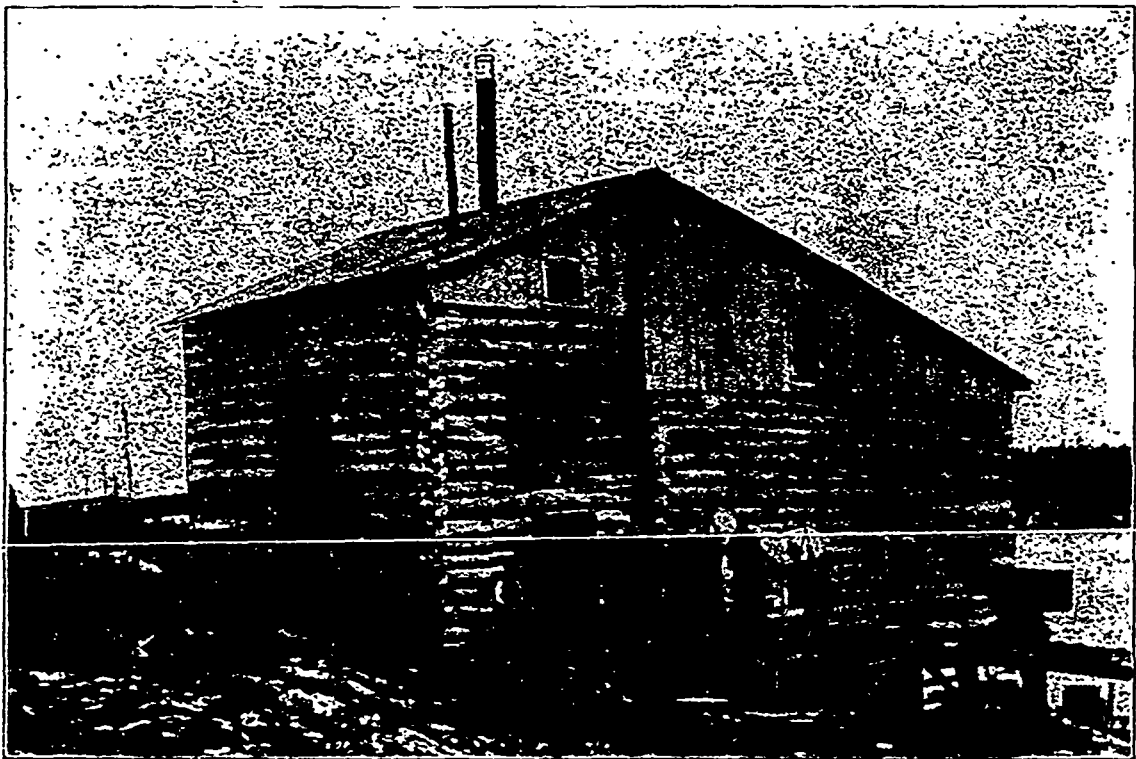
Snap shot in Lower Level, Sultana Mine.



10 Stamp Mill, Regina Mine.



Reduction Works at Rat Portage Ont.



Cold Hill Mill, Lake of the Woods, Ont.

Besides the foregoing silver producing camps there are other mining camps in West Kootenay which carry more or less silver, for instance, Trail Creek which carries a few ounces in its pyritic gold ores, also some argentiferous galena deposits.

Boundary Creek country has some ores of silver, which run a high value. The telluride Hessite has been found in this district.

Cariboo Creek, mainly a gold camp like the foregoing, also carries considerable silver in places, yet not one of these promises to be a silver producer to any great extent at present.

With the exception of a piece of country west of the Slocan, and another between the Slocan and Trout lake, there is no great extent of country left unexplored by the prospector.

There is, however, a vast amount of mineralized country as yet not thoroughly prospected. Besides the chance finds which always turn up after considerable development has taken place, even in old camps.

The accompanying illustrations do not show much of the mines themselves. The paraphernalia of a Slocan mine is not great, usually a bunk house, ore house, blacksmith shop and tunnel, and these are often too far up a steep mountain for the photographer or casual sight-seer to visit: Hence little is heard of them except in the matter of shipments and dividends.

EN PASSANT.

Mr. W. A. Carlyle, M.E., Provincial Mineralogist for British Columbia has issued in pamphlet form an exceedingly interesting sketch of the Trail Creek mining camp. This practice of prompt publication of official bulletins is to be highly commended and could well be emulated by the other provinces with advantage to the mineral development of the country. Perhaps Ontario will also take time by the forelock and give us in handy form Dr. Coleman's report on the new gold fields in the Lake of the Woods, Rainy River and Manitou regions. This report to be of service must be issued at once

Mr. A. Leofred, who claims to be a mining engineer from Quebec, but whose status in the profession, the REVIEW is unable to determine, appeared the other day in Ottawa to present his claims for a subsidy from the Dominion government towards his proposed Montreal Bureau of Mines. After a few incoherent remarks from the promoter, who appeared to have the haziest conception of the scope and direction of his own proposition, he was promptly "sat upon" by the Premier who informed him that when a "practical scheme" was submitted he would be pleased to give it his consideration. Mr. Leofred's philanthropy was "gilt edged" but a little too transparent and only served to give some amusement to the group of members of parliament and the few mining men who were present.

Apropos of a Bureau of Mines in Montreal there can be no doubt that such an institution, if properly equipped and operated on a business basis, would be of immense benefit to the mineral development of the country. As the outcome of the last meeting of the General Mining Association of the Province of Quebec, the Provincial government has been approached with a view to obtaining a grant for the equipment and maintenance of a Bureau having particular reference to the mineral industries of the Province of Quebec. The scheme in outline, is as follows:—

To provide suitable rooms in the business centre of the city where mining men and capitalists may meet.

To maintain a first-class collection of the ores and minerals of the Province and their manufactures.

To establish a reference library of mining literature.

To preserve and keep readily accessible to the public, data respecting the history of mining undertakings.

The Bureau it is proposed will be operated directly under the auspices of the Association in conjunction with the Hon. the Commissioner of Crown Lands. Such an institution is a necessity. Investors in mines are proverbially shy and do not go running about into out of the way corners shouting for opportunities to stake their money on the chances of mining. The capitalist has to be sought out and the arguments and evidential proofs in favor of the undertaking must be right at hand in order to secure attention. The Province of Quebec has had a hard struggle to maintain its mineral industries. Its iron furnaces have had to be fed with bounties and protected by tariff; its phosphate mines have been closed by competition with foreign production and as the markets for this mineral were abroad no protective tariff could help the industry and it bore the weight of the tariff against its own expenditure for supplies. The asbestos mines have, until lately, been depressed by low prices and limited demand. The mica mines have to contend with East India mica and manufactured scrap. The gold fields have seigniorial rights and doubtful titles to restrain them; and plumbago or graphite now claim consideration. There is much to struggle against but there is no doubt of the richness and extent of our mineral deposits. What is needed is to have the tendency of the age in the direction of large operations applied to the mining industries of Quebec, in order that the economies obtained by work on a large scale with the best appliances and skill may enable profits to be made where otherwise they would be impossible. Many of the attempts at mining have failed in this Province because they were undertaken without sufficient capital to provide either efficient appliances or competent management, and it is believed that if large capital could be appropriated to many of our mining undertakings, they would show successful results. The plethora of idle capital in the great money centres, notably in London, the enthusiasm that has arisen for gold mines, the fact that political troubles have turned enterprise away from South Africa and the evidence already accumulating that Canada is to receive a great share of attention, all these are reasons for the exercise of the most intelligent and progressive efforts to attract notice and cause the passing capitalist to linger long enough to investigate our resources and the prospects of producing mineral wealth. A Provincial Mining Bureau in Montreal operated by practical mining men is much to be desired and we are pleased to learn that just as soon as suitable premises can be secured in a first-class business centre, the Provincial government will lend its co-operation and assist it by an annual grant.

In passing through Toronto the other day we were pleased to observe at the Toronto Exhibition a capably arranged display of quartz specimens from the new gold fields of north-western Ontario. The samples were of good size and characteristic of the mill-rock of the Sultana, Regina, Foley, Empress, Lake Harold, Crystal, Mikado and other mines in active operation. The exhibit attracted a good deal of attention and was very favorably commented on by all who saw it. Mr. Blue, the Director of Mines, is to be congratulated on this endeavor to interest the people of Ontario in the mineral wealth of their own province. Possibly before another year is over this popular Exhibition may be equipped with a permanent display of Ontario's mineral resources.

At a time when capitalists are seeking safe investments for their money, and when comparatively new and untried mining ventures in various parts of the globe are tempting fortune seekers, it may not be unreasonable to point out the superior claims of our Canadian gold fields. In Nova Scotia particularly, absolutely safe fields for investment await attention, fields certain of yielding large profits and entirely free from the character of speculation attaching to similiar pursuits in other countries. The area of the gold measures of this Province has been estimated by various authorities to be from 5,000 to 7,000 square miles or from one-fifth to one-third the area of the Province, yet the actual area.

from which the gold thus far obtained has been won is less than 40 square miles. Taking the total value of the whole gold product to the first of the present year as \$12,000,000, in round numbers, it will be seen that each square mile of surface upon which paying gold lodes have been found has yielded nearly \$9,000 per year for each year since discovery, or \$300,000 per square mile. The history of nearly every mine in Nova Scotia may be traced from official records in the Department of Mines, and its productiveness may be determined from the inception. An immense advantage is thus given to investors if they obtain mining properties with a record that a glance discloses the value of the mineral yielded from them. In almost every case where business prudence has been exercised in the selection of a property, or in the choice of a manager, success has been the result. During the past three years an impetus has been given to gold mining in Nova Scotia by the working in several places of large bodies of low grade ore. Several deposits yielding from three dollars to seven dollars per ton have been equipped with modern machinery and each of them has prospered, having earned dividends for the companies owning them. In many places these properties have been equipped with plants that will stand comparison for effectiveness and economy, with those of any other producing country in the world.

We hear that several undertakings are on foot having for their object the exploitation of the old river beds of the Chaudiere, Quebec. There is no doubt, as can be proved by the evidence furnished both from the reports of our Geological Survey and from other authentic sources, that in the ancient channels of nearly every stream tributary to the Chaudiere, above St Joseph, gold can be obtained in paying quantities with proper management and appliances.

The price of American asbestos mined on the Pacific coast has dropped from \$50.00 per ton to \$8.00 per ton.

At Brookfield, Nova Scotia, and at the Sultana mine, Lake of the Woods, chlorination works have been built and are in operation, these we believe being the first two gold mines in the Dominion to adopt a systematic treatment of their tailings and concentrates. Everywhere throughout Canada where gold mills have been operated, there are old dumps containing thousands of dollars but of such low grade that they have been regarded as of little value by their owners. In the early days of gold milling in Nova Scotia there was not so close a saving of values as modern machinery and methods have made possible and a considerable percentage of the precious metal escaped. Even with the superior mechanical appliances of the present day there is considerable loss varying from 15 to 40 per cent. according to the character of the ore and the state in which the gold occurs. In this connection the results accomplished by the Harguhala Gold Mining Company in Yuma County, Arizona, will be of interest to our gold miners. The assistant manager's last report, on the operations for one month, is as follows; Pulp treated, 3,000 tons; average assay of pulp, \$4.43 per ton; extracted according to assays, 59 per cent.; bullion realized, \$6,555; miscellaneous revenue \$2; total revenue, \$6,555; operating expenses, \$3,784; expense, \$623; total expenses, \$4,407, showing a profit of \$2,148.

With a view to aiding prospectors the Government of New Brunswick gives notice of its intention to purchase a diamond drill early next year. Parties using the drill will pay all operating expenses. A government drill should be of greater service in New Brunswick than it has proved in Ontario, particularly in locating and proving the value of its coal and iron resources.

The mining of any mineral can be, should be, nay, must be put and maintained upon the same footing or business management as the best

operated of our railroads or other commercial undertakings. But mining enterprises worthy of the consideration of the investors must start upon the basis of meritorious properties more or less developed with a valuation at the outset to those investing in the exploitation honestly or equitably adjusted between the parties entrusted. Mere prospect holes—such as a great number of the properties now being promoted with a large capitalization from the the Trail Creek district, should be avoided. Assuredly a very large number of the schemes so plausibly put before the public at present by glib tongued yankee "boomers" will never begin to pay working expenses. Great caution must therefore be observed. There is an abundance of good mineral properties to be had in Canada by proper seeking at reasonable prices, the development of which to a profitable stage is an assured business matter if the same skill, care, judgment, energy and earnestness of purpose be brought to that end which are regarded essential for success in any other business enterprise. And while this is an absolute fact, at the same time, it can be claimed for mining enterprise that in no other undertakings is there such chance for making a great deal of money upon a comparatively small investment as from mining ventures.

The superintendent of the Philadelphia mint has made an important statement to the effect that if a free silver coinage law should be enacted at this time it could not be enforced. He points out that it would be a physical impossibility for the government to coin the silver which under the provisions of such a law would be dumped into the mints. The government vaults now contain 200,000,000 ounces of silver bullion and at the present minting capacity it would require five or more years to coin this into money before an ounce of the bullion which would be poured in under a free silver law could be touched. The superintendent claims that ten years would be required to increase the capacity of the mint, during which time bullion would be accumulating in such quantities that the mints would never be able to use it up. The answer of the average silverite may be anticipated. He wants the government to provide storage for vast accumulations of bullion, and then issue silver certificates to the coinage value of the bullion, at a ratio of 16 to 1. Really he does not want silver at all. In fact he would rather not have it. He wants paper.

Official returns of the mineral exports from the Kootenay district, British Columbia, for the year ended 30th June last, show:—

Gold	30,673 ozs.	of a value of	\$552,135
Silver	1,459,629 "	" "	969,215
Copper.....	1,164.7 tons	" "	129,250
Lead.....	6,020 6 "	" "	220,849
			<u>\$1,871,449</u>
Exported <i>via</i> Revelstoke.....			641,000
Total			<u>\$2,512,449</u>

The report in mining circles that the Le Roi mine had been bonded to English capitalists for \$5,000,000 is without foundation. It is quite true that several syndicates have had representatives looking over the property, but nothing more has been done. The output of the Le Roi is more than taxing the hauling capacity of the railroad. About 100 tons a day are being transferred. The company has also made arrangements with the Everett smelter to take 1,000 tons. About 50 tons a day are being hauled to Northport by teams; where it is transferred to the railroad.

During the past year our Canadian papers have been flooded with the specious advertisements of a company called the National Ore and Reduction Company, of St. Louis, Mo. This concern is a quack of the first water and has been humbugging the public under various guises for a number of years. Its status and antecedents are not such as would

warrant business dealings with our people. Our contemporaries have doubtless learned something of its financial standing and business methods; those who have not would confer a favor on the public if they refused its advertisements at any price.

The history of English investments in Canadian mining enterprises is none too good reading. Abandoned mines and dismantled machinery are standing monuments in many parts of the country to capital that has been misapplied and to management that has been bad. Mr. Thos. Tonge in a letter to the London *Mining Journal*, gives the following reasons for the disappointments realized in mining investments on this side. He says:—

“Many mining enterprises, good and sound in themselves, placed in England, have proved financial failures to the shareholders by reason of the following:—

“1. Over-capitalization. For instance, a property for which the vendor received (say) £20,000, being more than worth every shilling of it, is floated on the British market at (say) £50,000 or £75,000, or even more, with the result that, whereas the property would have paid handsome dividends on a capital of £30,000, no management can make it pay satisfactory dividends on the exaggerated sum at which it is floated.

“2. Exorbitant ‘rake-off’ by promoters and middlemen, which inevitably is at the expense of the duped shareholder. Too many promoters are not content with a fair remuneration for their trouble, but look for big profits from unloading stock and not from ore shipments.

“3. Excessive office and directors’ expenses at the English headquarters, even though involving the curtailing of necessary expenses at the mine. The wealthiest and most experienced and successful mining men in Colorado do not waste their time on public stock companies with the minimum of efficiency and the maximum of red tape formality and office expense, but form themselves into small private syndicates or companies, the capital being furnished by themselves and a few personal friends, and the money put into efficient work on the properties.

“4. Inexperienced and incompetent mining engineers, managers, &c., usually relatives or connections of the directors, sent out to report upon or manage, or in some way draw a salary at the mine.”

Everyone acquainted with Canadian mining will endorse the truth of Mr. Tonge’s observations. At the same time it is noteworthy that not a few Canadian mines upon which thousands of dollars were expended foolishly have been, and are to-day, being worked at a profit by Canadians and Americans.

The value of one pound of coal at different epochs in steamship evolution has been stated in striking form by Mr. A. J. McGinnis, president of the London Engineering Society. In 1840 a pound of coal propelled a displacement weight of 0.578 ton eight knots; but the earning weight was only one-tenth of this, as 50 per cent. of the displacement represented the machinery and fuel, 40 per cent. of the hull, and 10 per cent., or 0.057 ton, the cargo. In 1850, with iron vessels and the screw propeller, a displacement weight of 0.6 ton was propelled nine knots by the pound of coal; but the proportion of cargo had risen to 27 per cent. or 0.16 ton. In 1860, with high boiler pressure and the surface condenser, 0.82 ton displacement was propelled ten knots, and the cargo was 33 per cent., or 0.27 ton. In 1880 the compound engine was in full swing, and 1.8 tons displacement was propelled ten knots, and the cargo was 50 per cent., or 0.9 ton. In 1880, in the freight steamer, 2.1 tons displacement was propelled ten knots, with still 50 per cent., or 1.05 tons of cargo. In 1895 there were two classes of freight boats: The “tramp” (working better than the tramp on land) propelled 3.4 displacement tons eight and one half knots, with 60 per cent. or 2 tons of cargo. At the same time the huge cargo steamers of the North Atlantic were driving a displacement of 3.14 tons twelve knots with 55 per cent. or 1.7 tons of cargo. On the express passenger steamers the cargo weight is down to 0.09 ton per pound of coal.

The Prussian government has, for the purpose of examining the geological condition of ground, drilled a number of bore holes throughout the coal-fields of Upper Silesia. The deepest hole so far drilled, which is probably also the deepest in the world, has a total depth of 6,510 feet. In its course eighty layers of coal were found, with a total thickness of 290 feet, and besides these practical results the boring of this hole has made possible scientific observations of great interest. The rise of the temperature in the bore-hole was carefully recorded and was found to be one degree Celsius for each 110 feet advanced. This figure is quite in keeping with the generally accepted increase in temperature as obtained by Lord Kelvin at the St. Gotthard tunnel. The work upon this boring was completed in 399 days, which gives an average of a little over 16 feet per day. The cost was \$19,000, or almost \$3 per running foot. During the past fifteen years the Prussian government has had about 400 borings drilled in various localities, for which altogether more than \$3,000,000 were spent. The total length of these holes is 425,000 feet, the average cost being about \$7 per foot.

The first meeting of the Canadian Mining Institute (Federated) will be held at Montreal early in January next year, when a first-class programme of papers and entertainment will be provided.

The members of the Council of the General Mining Association of the Province of Quebec, are requested to meet in the Windsor Hotel, Montreal, on Thursday evening 8th October, for the transaction of business.

The last clean-up of the Cariboo Hydraulic Mining Co. realized a brick of a value of about \$82,000 making a total output so far this season of over \$100,000. It is confidently anticipated that the gold yield for the year from this mine will reach about \$200,000. When the lower and richer benches are reached the output will of course be much greater.

Mr. E. D. Ingall, M.E., Chief of the Division of Mineral Statistics, Geological Survey of Canada was married on 2nd instant to Miss Emily Gertrude (Baldwin) daughter of the late Capt. Fitzgerald. THE REVIEW extends its heartiest congratulations.

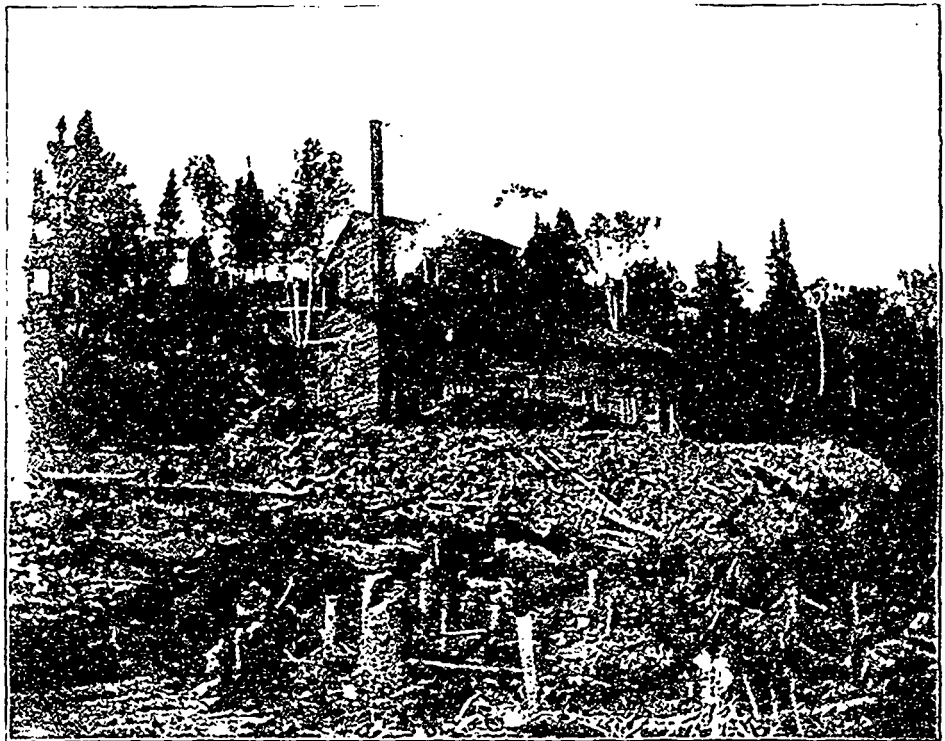
One of the best indications as to the kind of management of a mill is the amount of lost time in running. Good records in this respect can only be obtained with good machinery and good management. The following figures, extracted from the last annual report of the Alaska Mexican Mining Company, speak for themselves as to both these essentials. The mill is of 60 stamps, with Frue vanners, supplied by Fraser & Chalmers:

Number of Stamps, 60; weight, 1,020 pounds.
Drops per minute, 97; height of drop, $7\frac{1}{2}$ to $8\frac{1}{2}$ inches
Total tons crushed, 79,439, of 2,000 pounds.
Tons of concentrates produced, 1,597.
Total time lost in 12 months, 5 days, 16 hours.
Of this, time taken for cleanups, 2 days 12 hours.
Actual lost time from other causes, 3 days, 4 hours.

The duty of the stamps was 3.68 tons per 24 hours of running time, the ore being hard quartz and the screen 40 mesh. The total cost of milling, inclusive of the inclusive of the chlorination of sulphurets, was 45 cents per ton of 2,000 pounds. The cost includes every pound of material of every description used in the mill during the year, and all costs of repairs and renewals of machinery. The mill was operated 207 days by water power and 152 days by steam power. The avoidable loss of time is equivalent to only $6\frac{1}{2}$ hours per month. What is still more remarkable in this record of lost time over so long a period is the fact that it includes the necessary time for several changes from water to steam power and *vice versa*.



Interior of Reducing Furnace, Sultana Mine.



Ten Stamp Mill at Empress Mines, Jackfish, Ont.

CORRESPONDENCE.

Rand Machinery in the West.

The Editor:

Sir:—As a reader of your paper and as one interested in the development of the mining industry in Canada, I have read with a great deal of pleasure the very comprehensive article from the pen of your Rossland correspondent in the July issue.

I refer to the article describing the Trail Creek district, its formation, its different mines and its mining machinery. It interested me very much because being interested in and President of the Canadian Rand Drill Co., we have been doing much business in that locality. The impression, however, that would be made on one reading this article, would be that all of the plants in the district have been supplied by one manufacturing company, while this is most certainly not the case.

Your correspondent was evidently only partly advised regarding the machinery and I think it only fair to the company that I represent, that people interested in this matter should know what the facts are.

The Canadian Rand Drill Co. has been established in Canada about seven years, and have done their share towards developing the mining industries, in the way of furnishing mining machinery to all parts of the Dominion where the mining of iron, coal or precious metals is carried on and in the mining districts of British Columbia, described by your correspondent, we have furnished the following mines with air compressors and drills:

War Eagle Mine, a 20-drill air compressor, which is shown in the photograph on page 161 of your July issue.

The Le Roi Mine, a 16" x 24" air compressor has been in operation two or three years, and we are now building them a duplex, compound, Corliss engine air compressor, with a capacity of 40 drills.

Cliff mine—12 x 18 in. compressor, with the complement of drills.

O. K. mine.

Poorman mine.

Lucky Jim mine.

White Bear mine.

The Hall mine.

Pilot Bay mine.

Centre Star mine.

We are also building a plant for the Georgia mine, Byron White Co., Commander Co. mine, also Crown Point Co. mine.

Aside from these mines, the Columbia and Kootenay are using the Canadian Rand drills.

All of the mines mentioned above do not yet use compressors, but when the orders are filled which we now have on our books we will have 12 or 14 air compressors in that field.

We give great attention to our designs, and take a personal pride in our business, outside of the money-making feature, and I write this letter simply that the Canadian Rand Drill Co. may receive the credit due them, and to have the facts appear just as they exist.

Yours very truly,

J. F. LEWIS, President.

CHICAGO, 10th Sept., 1896.

ONTARIO MINING INSTITUTE.

Holds a Successful Meeting at Rat Portage—Numerous Resolutions Affecting the Mineral Industry Adopted.

Pursuant to its plan of holding local meetings of mining men at various points in the province, the Ontario Mining Institute held a meeting at Rat Portage on Tuesday and Thursday evenings, 8th and 10th September. It was originally intended to convene on the 1st September, but at the request of the C. P. R. who held out prospects of a material reduction in the rates of transportation, the meeting was postponed for a week. This proved an unfortunate circumstance inasmuch as many of the members from the East who had arranged to be present were unable to get away for the later date. The meetings, nevertheless, were highly successful, both as regards attendance and in the amount and character of the business transacted. The opening session was held in the large Board Room of the Bullion Mining Co. kindly placed at the disposal of the Institute, Mayor Barnes presiding. The room was crowded and many were unable to obtain admittance.

MAYOR BARNES in opening the proceedings welcomed the Institute to Rat Portage, and in passing dwelt upon the importance of the gold mines of the Lake of the Woods and the benefit that such a meeting would confer in extending knowledge of the resources of their district and in giving prominence to the requirements of the gold mining industry.

MR. B. T. A. BELL, the secretary, briefly reviewed the work of the Institute and the sister societies in Nova Scotia and Quebec. Among the subjects for discussion at this meeting was that relating to the cost of explosives and the duty on mining machinery. Many of the members were of opinion that the time was opportune for an effort to have these necessities of the miner placed on the free list. For instance, one of the largest operators in Canada, the Canadian Copper Co., had written as follows:—

"With reference to subject 'A' of the duty of high explosives, we would say that we heartily concur in the suggestion of having the duty abolished. We are large users of explosives and we know that its abolishment would be a very material aid, to not only this locality, but to all other mining districts in Ontario. We trust that the efforts of the Institute on this question will be supplemented by all interested parties, with the result that the Dominion House will be persuaded that the country will benefit by the free entry of high explosives."

Personally he was averse to any interference with the duty on these commodities. The law relating to mining machinery was, he was in a position to know, being interpreted with the greatest liberality by the Department of Customs and their mineral operators had no difficulty in getting in duty free such mining and smelting machinery as was not manufactured in the country. Some protection ought to be given to manufacturers like the Ingersoll and Rand Drill companies, the Truro Foundry Company and other establishments which manufacture in Canada certain lines of mining machinery of a quality quite equal to the same machinery manufactured in other

countries. With respect to the duty on explosives he was extremely doubtful whether the miner would in reality be benefitted by any change of the law. While quite in sympathy with any movement which would reduce the cost of their explosives—say to a price equivalent to that at which the same grade of explosives was sold in the United States—he believed that an agreement existed between the manufacturers on both sides of the line and that if the duty was removed a large establishment like the Hamilton Powder Co. would close its works and simply sell foreign explosives at as high a price as formerly. However, these were matters for the mining men of the country to decide and the Institute would take action on any suggestions they had to make.

A matter of importance was the necessity of immediate publication by the Provincial and Dominion Governments of all the data in their possession respecting the mineral districts of their province. Dr. Coleman, the provincial geologist, who they were pleased to see present at the meeting, had spent two summers in the gold fields of the Lake of the Woods, Manitou and Rainy River districts, which were now being developed and which were exciting interest among capitalists. He thought it eminently desirable that the report of Dr. Coleman's investigations should be published immediately and distributed in pamphlet form separate and distinct from the annual report of the Bureau of Mines. In this way those people who are being interested in these regions would have a useful and authentic report for immediate reference which could not fail to be of service in promoting the development of the district. He concluded by referring to the interest being taken by the people of Ontario in mining speculations beyond their own province. Many of the schemes being put before them were "wild-cat" and should be avoided. British Columbia which absorbed so much interest at present was not altogether an Eldorado. All is not gold that glitters—much of it, particularly from the Trail Creek camp was, he was sorry to say, not even gilt. The people of Ontario had a great gold field at their own door easy of access and convenient for personal examination. The ores were free milling, the cost of fuel, labor and supplies comparatively small. That the deposits were permanent might be inferred from their geological structure and from the success of the "Sultana" and other workings carried on to depth. He predicted a great development for the Lake of the Woods when the value of its gold deposits were fully realized.

DR. A. P. COLEMAN then addressed the meeting giving a graphic description of his travels in the Manitou, Rainy River and Lake of the Woods. He had, he said, covered a large extent of country and had seen a series of rich gold bearing veins in a geological formation that up to the present had not been thought to belong to the gold bearing rocks. At Mr. Proudfoot's properties he had found gold bearing veins in the gneiss. At the now pretty well known Saw Bill Lake mine he found a shaft down fifty feet in a vein six feet wide. He had also stopped at the Harold Lake mine and at other discoveries in the interior. At the far down Seine river where a very keen interest is centered just now, he had seen many rich veins. He had arrived at the Foley mine just as Mr. Foley himself had arrived there. Very sensible work has been done at that mine, and it had proved that they had a rich property. Good work was also being done on the Ferguson, which had proved to be exceedingly rich. At the Lucky Coon a considerable amount of work had been done, and after being suspended for a time is again being resumed. It was very strange that, although the first mine discovered in the Rainy Lake region was on the American side, the gold belt is nearly all in Canada. Two years ago he had been present at the founding of Rainy Lake City, and this summer when he visited that place he again found the Little American mine running after a lengthy suspension. He then came on to Fort Frances, where he did not delay, but started up the Manitou. There he found a series of rich veins, some having very brilliant specimens. At the Haycock mine he found a little prospecting five stamp mill pounding out the gold. On the Manitou he also met Messrs. Gass, Leuillier, Landon, Leahy and others; some in pretty good comfortable camps and others in poor ones. The veins of the Manitou were small, but exceedingly rich. The only doubt respecting them was as to quantity; their richness had been proved. From there he had travelled across the country and was five days without seeing a white man until he reached White Fish Bay. One of the most cheerful sights he ever saw were the whitewashed camps of the Regina mine. The puff of the steamboat at that mine was a pleasure he had not witnessed for some time, for there are no steamboats on the Manitou lake. After that we felt we were in civilization again. At the Regina active mining and milling was in progress. From there we started northwards to Rat Portage where we enjoyed the hospitalities of the house next door (meaning the Hilliard house.) From there we set out to see more of the neighboring region. South of Rossland we found some very promising looking things, and on south to the Gold Hill mine, where we found the stamp mill pounding away. He also made a visit to the Mikado, where active mining was in progress, and when he returned again to Rat Portage he was delighted to hear the reduction works pounding out Mikado ore. Finally, last but by no means least, he visited the Sultana mine. One and all, we take a peculiar pleasure in the Sultana. So long as it keeps on pounding out the gold bricks, so long will the Lake of the Woods gold fields be kept before the public. He was delighted to find his old friend, Mr. J. F. Caldwell, on the high road to prosperity.

The gold bearing country covered a territory two hundred miles long by about one hundred miles across. In all that region there are no wide gaps in which there is no gold. There are gold belts every ten or fifteen miles. This was an extent of country not to be found anywhere in which the gold was so generally diffused. Secondly, the majority of the best mines are found very close to the contact of the granite or gneiss with the Huronian, generally in the green rocks locality known as the Keewatin. Your town or rather Keewatin, has the honour of giving these rocks a geological name. The gold ores are contained mainly in lenticular or bedded veins. Near Little Turtle lake are some very rich bedded veins. True fissure veins occur in the granite or gneiss. The country rock of the Sultana is really a dragged out gneiss. The Regina and the Mikado are contact veins.

In conclusion Dr. Coleman thought a Government customs mill would be of great service to the district in aiding prospectors and small operators in determining the value of their claims. If prudent, business-like methods were pursued in the management of their mines he could safely forecast a great future for mining in this region.

GENERAL WILKINSON (Regina Mine) endorsed the plea for free explosives and mining machinery. His experience of Canadian machinery had not been satisfactory. He thought it scandalous that large blocks of public lands should be locked up in the hands of speculators. The explorer should be encouraged. Referring to Dr. Coleman's remarks respecting the permanency of these veins, he was confident that gold in workable quantity would be found at great depth, and suggested that deep mining should be encouraged by the Government, either in the form of a bonus or in other ways. Other countries had adopted this plan with great success. On Monday they had celebrated at the Regina the first anniversary of the dropping of their stamps. Their main shaft was now down 176 feet, having been sunk 16 feet in August. The tunnel had been run 214 feet; the first level south, 133 feet; the second level south, 152 feet. He had thought it unwise to run either the first or second levels north under the lake, as a break in the formation might be found and let in the water. He was confident that deep mining would pay in the Lake of the Woods.

MR. N. C. WESTERFIELD, St. Paul, Minn., advocated the adoption of a Joint Stock Companies Act, which would permit the issuance of a charter quickly and

at a less cost than at present. He also urged the formation of a mining exchange which would act as a medium between the prospector and the capitalist and be of great service to both. Shares sold at a discount would enable the prospector to secure working capital more readily than if sold at par.

Mr. C. W. CHADWICK endorsed the remarks of the previous speaker. Any combination of four or five men, he thought, should be able to secure a charter at short notice, and put the stock upon the market for what it is really worth. He thought that some resolutions might be prepared which would express the opinions of the people of the district, and to this end he moved that a committee be appointed to draw them up and submit them at another meeting to be held during the week.

CAPT. DEALY seconded.

Mr. BELL did not believe in the practice of gambling in mining stock, and he did not wish to see it introduced in Ontario mining. If a mine was worth anything at all it could be capitalized at a reasonable figure and the stock sold at par. Large capitalization was not required in the Lake of the Woods where the working costs were low. Further, it was necessary to give some sort of protection to the public, hence the desirability of advertising the application for a charter for thirty days prior to incorporation.

GENERAL WILKINSON agreed that a dollar's worth of stock should be sold for a dollar. In England a heavy tax was made on chartered companies.

Mr. H. LANGFORD said he had come late, and had not heard all the discussion, but had listened with interest to what he had heard. There was no difficulty about selling stocks at a low price. The low price simply represented the value of the prospect at the commencement, and as its value was increased by development the value of the stock increased. He did not see why the Government should try to take under its charge the whole of the people of this country. They should give them a chance to speculate in stocks if they want to. As to selling stocks that were fully paid up and non-assessable, at a low figure, there was nothing in the law to prevent it. The Government had heretofore refused to grant charters with a large capitalization. He did not see why they should not incorporate a company for a million dollars capital, or \$5,000,000 or \$6,000,000 if they wanted to. He was in sympathy with the remarks of Mr. Chadwick. He must say he did not approve of the joint Stock Companies Act as it stood. The Government had refused to give the powers in charters that were asked for. He did not see why they should not allow the people to organize with full powers to carry on their business. The Government should not try to be so paternal as to hinder the people from speculating in stock if they want to. The trouble with them was that they were not sufficiently posted as to our needs, and therefore did not give the powers that were wanted.

Mr. FRED. PROUDFOOT thought both the Joint Stock Companies Act and the Mining Act could be amended to good advantage. One point was very defective. The law in respect to miners' licenses was very defective. If a miner took out a certificate the law should give him some rights. He did not find the statute sufficiently clear. He thought a prospector should have sixty days within which to perfect title to a discovery. The law gave him no rights in that respect.

Mr. T. R. DEACON spoke of the large extent of country to which Dr. Coleman referred. He said only a very small portion of it had been thoroughly prospected. There were still millions of acres open. He had surveyed a large number of locations in the last few years, and the best properties were those he had surveyed this year. As he interpreted the Act a man can hold a prospect for a reasonable time if he will blaze a tree and write his name on it, and then make application to the Government.

After some further discussion the following were appointed a committee to draft resolutions:—B. T. A. Bell, Dr. Coleman, C. W. Chadwick, George Drewry, T. R. Deacon, General Wilkinson, K. Rogers, F. Proudfoot, N. C. Westerfield and H. Langford.

The meeting then adjourned till Thursday evening at the Town hall.

Meeting on Thursday Evening.

The adjourned public meeting was held in the Town hall, Rat Portage, on Thursday evening, Mayor Barnes in the chair.

Mr. PROUDFOOT presented the report of the Committee on Resolutions, which, after being submitted clause by clause, was adopted as follows:—

“Whereas the Ontario Mining Institute having caused this quarterly meeting to be held at this place, and having called a public meeting of the citizens and mining men of the place and district, and after listening with great interest to the able address of their worthy secretary, Mr. B. T. A. Bell, Dr. Coleman of the Toronto School of Practical Science, General Wilkinson of the Regina Mine, N. C. Westerfield, capitalist and mine owner of St. Paul, Minnesota, and having heard also the views of many influential citizens and mining men, the following resolutions were unanimously adopted:—

In view of the fact that the attention of the whole world has been drawn to the mineral resources of the Dominion, and that millions of foreign capital have gone into mining enterprises in British Columbia, and in view of the fact that the Province of Ontario has an enormous area of mineral lands (covering some 20,000 square miles), and the fact also that its vast wealth in mineral resources (though now amply proved by actual results) has not been fully aided or given prominence to.

Be it therefore resolved: 1. That the Ontario Mining Institute be respectfully requested to use its power and influence with the Ontario Government to induce it to give its assistance to the district in every way in its power, feeling that by doing so it will result in vast advantage to the provinces at large.

2. In view of the fact that as yet no map of the Lake of the Woods district has been issued showing the locations which have been patented or applied for as mining locations, the Government be urged with all possible speed to issue the best map possible showing locations surveyed or taken up to date, and that the same be distributed broadcast and free of charge, as the Province of British Columbia and other Provinces are doing, both as to maps and literature respecting their resources.

3. Resolved in this connection, that a sub-agency of the Crown Lands Department (having special reference to the mineral lands of the District) be established at this place, where maps (corrected up to date) and all possible information can be had as to their lands; and that a cabinet of minerals be placed here in connection with said agency.

4. As to the formation of Joint Stock Companies for mining purposes, be it resolved, that the Ontario Government be urged to pass an enactment whereby such companies, for mining purposes, can obtain a charter with greater speed and at a much less cost than at present.

5. That the present law as to Miners' License be changed so as to define and settle the right of prospectors to hold a claim for sixty days after discovery thereof, and that in the event of his discovery not being surveyed or paid for within that time, the location be considered as abandoned.

6. Be it resolved, that the Government be urged to establish a Mining School at this place during the winter months so that miners and those interested in the mines may be able to avail themselves more fully of its benefits.

7. So far as regards the annual rental now charged upon mining leases, be it resolved, that the Government be urged to allow the same (or so much thereof as has

been paid as rent), to be applied upon the purchase money for said land when the patent is applied for, and that this rule be made to apply to all mining leases now outstanding and hereafter to be granted.

8. Resolved, that the present law as to royalties upon the precious metal, while of little utility to the Government, is a serious impediment in the way of investors, and should be totally abolished.

9. Lastly, it is the unanimous opinion of this meeting, and of many competent judges, that this district, both as to its mineral resources and as to its advantageous position for mining, is second to none in the Dominion of Canada, and is fully justified in claiming some of the millions of foreign capital now going into the mines of the West, and that any assistance now given by the Government in utilizing or in setting forth its advantages will result in great benefit to the Province and District, and will come at a most opportune time.

SUPPLEMENTARY RESOLUTIONS.

Resolved, that a map of all locations in unsurveyed territory be prepared by the Crown Lands Department once a month (showing locations up to date), and a copy to be sent to, and posted up, in the Crown Lands Office in each mining district in the Province.

Resolved, that the secretary of the Institute be instructed to communicate with the Honourable the Commissioner of Crown Lands, with a view to securing the immediate publication of Dr. Coleman's report of his geological investigations in the Lake of the Woods, Manitou and Rainy River gold fields, and that the distribution of said report be made in pamphlet form, separate and distinct from the annual report of the Bureau of Mines. Further, that the Director of the Geological Survey of Canada be requested to publish at the earliest possible date all information in his department respecting these districts.

Resolved, that all machinery and explosives used in mining be admitted free of duty in all cases where the same (considering the question of freight charges) can be laid down at the lowest cost to the purchaser, and that the Institute be respectfully requested to use its influence with the Dominion Government in having the law amended so as to cover the desired change.

Resolved, that it is the opinion of this meeting that great advantage would accrue to the mining interests if the Ontario Government would appoint a competent assayer and mill-man to give reports of ores submitted either for mill test or assay.

Resolved, that the Ontario Mining Institute be requested to memorialize the Dominion Government with a view to securing an early abolition of the duty on explosives.

Resolved, that a hearty vote of thanks be tendered to Mr. B. T. A. Bell for having called the quarterly meeting of the Ontario Mining Institute to be held at Rat Portage, and also for the kindly interest he has lately taken in this district as a mining centre.

The Economic Value of Coal Dust.

By W. BLAKEMORE, M.E., Glace Bay, C.B.

This brief paper has been suggested by a series of letters which have recently appeared in various mining publications on “The Utilization of Waste Products,” and is in many respects a kindred subject; for it is not too much to say that some of the most useful and profitable manufactures throughout the world to-day are due to the inventive genius of man directed to the reclaiming of waste products.

If it is now possible to convert all the bye-products of coking into marketable commodities, yielding so large a profit that the manufacturer can afford to lose sight of the base; if blast furnace slag can be made into a valuable fertilizer, and if the unsightly heaps or banks from our mines, which hitherto have only disfigured the surface of the earth, are being transformed into excellent building material, surely it is time that scientific knowledge and practical experience should combine to remove the reproach which rests upon the mining intelligence of our day when, with few exceptions, 10 to 15 per cent. of all coal mined, after being reduced to powder or duff in the operation, is either left in the mines as useless, or, after being brought to the surface and handled at considerable expense, is either dumped in a waste heap, or, as in the Hocking Valley, blown away by artificial means to drape the hills with a sombre mantle and pollute the streams to an inky blackness.

The urgency of this question lies in the fact that of late years, owing to increased competition, mine owners have been compelled to place their coal in the market in a constantly improving condition. Fifteen years ago the average yield of slack in Great Britain was 20 per cent. of the output. A few days ago one of the highest authorities in the mining world stated that it is now 30 per cent.

In face of the improved appliances both for mining and screening coal, it cannot be a fact that more small coal is produced in operating the mine; it is rather to the before-mentioned circumstance that we must attribute this increase, and if it was an important consideration in the old days how best to manipulate the 10 or 15 per cent. of small actually left after allowing for colliery consumption, &c., it must be still more important to determine this now that the percentage is so largely increased.

One need hardly point out that the net result of producing 30 per cent. of slack is, that after consuming a possible 10 per cent. in the usual way there is a balance of 20 per cent. which, if no market be found for it, means an addition to the total cost of a corresponding percentage.

Of course the first aim of all mining operations is and must be to produce the minimum quantity of fine, at least until that day (of which science has already given some promise) shall dawn when all coal is reduced to impalpable powder and then converted into electrical energy before leaving the mine. In other words, the fruition of those hopes which depend on the direct production of electricity from disintegrated coal. Meanwhile, there can be no question that the first thing to aim at (and indeed this is not a question of option but compulsion) is to make good round coal, leaving some 30 to 40 per cent. of small. This, if properly handled, can be divided into 25 per cent. of nut and 15 per cent. of duff.

For the nut there is already an increasing sale in all populous centres, this class of coal being especially advantageous for cooking purposes, and also growing in favor for stoves, where anthracite is not absolutely necessary.

With reference to the 15 per cent. of duff; there are many purposes for which it can be profitably employed, and in this connection there is a fact too often forgotten, viz.: that the chemical constituents of the despised coal dust are precisely the same as of the large coal, and if intelligently handled are capable of developing an even greater potential energy. The reason of this is that by washing, practically all ash can be removed from the former, whereas, the larger lumps of the latter conceal many impurities.

The first important advance made in this direction was by Dr. Siemens, who, more than a quarter of a century ago, invented a gas producing furnace, which con-

sisted of a fire-brick chamber with fire bars at the bottom, a funnel at the top for charging the fuel, and a tube for carrying off the gas. This rudimentary producer, although still in use at a few works, has been greatly improved upon by recent inventors, among whom may be mentioned especially Wilson, Taylor and Dr. Mond. There is no doubt that as steel making is so rapidly superseding iron making, there is a great future for coal dust in this connection.

I have incidentally referred to what is at present the largest market for this article, namely coking; in fact, as is well known, there are large districts where the whole of the soft coal produced is crushed, in order to be converted into coke. On this head it has been conclusively established that to make a satisfactory coke all coal requires washing, and of the various appliances in use for this purpose, there is little doubt that for efficiency and economy, especially in dealing with large quantities, the "Shepherd" is far ahead of all competitors.

The next purpose for which coal dust can be most profitably used is in the manufacture of "patent fuel," or "briquettes." The extent of the business in these is difficult to realize, but the following figures will give some idea of what is done in South Wales, which is the home of this important and lucrative industry:

During July, 1896, Cardiff exported 36,081 tons; Swansea, 33,034 tons, and Newport, 7,832 tons. A total of nearly 77,000 tons. Of this, not less than 25,000 tons crossed the Atlantic and was distributed through the West Indies, Central and South America, the balance going principally to the Mediterranean and French ports.

Although this industry, like all others, has seen its up and downs, few indeed have proceeded upon the even tenor of their way with less fluctuation, and the popularity of the commodity has increased every year. This is not to be wondered at when the many virtues of this class of coal are considered, notably its cleanliness, portability, adaptability and durability, and I for one hold to the opinion that during the next twenty years it will largely supersede the use of ordinary coal. Recently it has made great strides in France, Italy, Spain, Central and South America for steam purposes, many of the locomotives using it exclusively.

The greatest hindrance to the development of briquette making has been the difficulty of procuring a cheap and efficient "binder." Hitherto pitch has been almost universally resorted to, but of late years, owing to the appropriation of the products of tar distilling for other and more profitable purposes, there has been a diminution in supply and consequent increase in cost. This has driven our inventors to seek some more suitable substitute and one or two have been discovered and patented. The most important has emanated from the well known firm of Cory, Yeo & Co., Swansea, and this has reduced the cost of manufacture to about one shilling per ton.

It is not impossible that having regard to the high percentage of pitch naturally contained in coal in the form of bitumen, science may devise a means of treating coal dust so as to compel it to yield its own binder by exudation. In any case, this branch of our subject presents many interesting and attractive features, and there is little doubt that in the near future it will furnish a still wider field for the use of coal dust.

The last and certainly not the least important direction in which we have to look for a market for this fuel is close to our own doors, where we are consuming from 5 to 10 per cent. of our output on and about the mine for fuel purposes. In this connection I would like to ask how many mines are confining their consumption exclusively to duff or even how many are using a large percentage of duff, and yet there is no reason why any higher class of fuel than this should be used for steam generation. Many processes have been invented, and some of them patented. The more scientific and costly require the duff to be ground to impalpable powder, when it is used by means of a high forced blast discharging it into a fire brick retort, where it becomes practically a floating incandescent mass. There are five systems working on these lines in Germany, the most successful being the "Wegener," but they are all open to a strong objection in the cost of crushing the coal to a uniform series of tiny particles, and the difficulty of maintaining a uniform heat.

There are, however, simpler appliances by means of which ordinary coal dust can be fired under any type of boiler in the usual way, and as satisfactory results obtained as by the use of more expensive fuel. The only preparation necessary is to restrict the admission of air, to substitute deeper and closer fire bars, and to introduce forced draught from the bridge, and not, as is generally done, at the front of the furnace. This forced draught can most economically and easily be produced by the introduction of a tiny jet of live steam, superheated in a retort before it impinges on the flame. This is the principle of the Wilton and also the Howl patents, which have worked satisfactorily for seven years, and which only require to be better known that they may be generally adopted.

From the foregoing brief summary of the uses to which coal dust may be applied, and the extent to which it has already been used, it is surely not too much to say that it has a high economic value, and that any firm allowing it to accumulate on a waste heap is neglecting to utilize a valuable portion of their produce.

Improvements at Joggins Colliery, N.S.

A correspondent writing from Joggins respecting the operations of the Canada Coals and Railway Co. says:—"Since the strike, matters have progressed very satisfactorily, and the utmost good feeling between men and management is the order of the day. Since the general election our working time has been much broken up till last week. This has been mainly due to the pernicious effects of the strike, as also to dull trade. We are now working steadily, and strong hopes are entertained that good work will reign from this out.

We find that consumers won't buy until September, probably due to the unsettled state of affairs in the country. Consequently shipping, by water particularly, has been very light. However, water shipments are now commencing, and we anticipate shortly much better trade than last year at this time. The railway shipments are steady and improving. The demand for small coal is exceptionally good, so much so that we are only able to supply half of the orders received.

Only one of the slopes is working, and No. 2 is being repaired with a view to opening up shortly. A fan 14 ft. in diameter has been erected and will be in operation this week at No. 3 slope. It is an open fan and capable of giving 50,000 cubic feet of air per minute at a speed of fifty strokes. It is a facsimile of the fan generally in use at the mines of the Summerlee and Mossend Iron and Steel Co., Scotland, and it has been proved to give results equally as good as the Guibal fan, everything being equal, and can be erected at about one-third the cost.

I should mention that the coal coming from the slope working (No. 3) is of a superior quality to that got in any other portion of the property, and our customers are loud in their praises regarding it, and I believe it is only a question of time when this coal will come to be recognized as the foremost coal for steaming purposes in the provinces, if not all Canada. It is also a good coking coal, and I intend sending you a sample at an early date."

MINING NOTES.

Nova Scotia.

There are a few wild-cat circulars still floating around booming up worthless properties, and we notice in one instance that the promoters are not above using expert testimony in a way that was never intended. To clip a report in such a manner as to convey a totally different meaning to that originally intended, is sinking about as low as possible, and we strongly advise the investing public to make inquiries before sinking money. When the whole report of an expert is not in a prospectus, it may fairly be assumed that there is a very good (or bad) reason for leaving parts out, and the practice is to be strongly condemned.

A company is being formed to start gold mining operations at Block House, Lunenburg County. Some very good ore has been taken from this property, but has had to be carted a considerable distance to be milled.

There have been several fresh discoveries of gold in various parts of the province. A new lead has been discovered at Forrest Hill. The Government had provided some money for the improvement of the roads, not, by the way, before it was needed. In repairing the road a boulder showing gold was found, and the lead was found by trenching thirty feet. Another accidental discovery has been made between the Salmon Hole gold mine and the Oxford mine at Chezzetcook. Some time ago a man was going through the woods, and in climbing a cliff pulled some moss away which revealed quartz; by pulling more moss away a wide belt of quartz was found which showed gold. The man made several attempts to locate the place again and only succeeded on Labour Day.

New finds of gold are also reported from Eastern Passage and near Rockingham.

Mr. Carnegie Williams, of London, has been examining some old tailing dumps at Rawdon in the interest of parties in England.

Mr. C. F. Andrews has resigned the management of the Richardson mine, and Mr. Cox, of Isaac's Harbour, will probably take control.

The Barachois mine at Wine Harbour continues to show improved returns.

The North Brookfield mine continues to keep up its very handsome returns; 376 oz. was the yield for last month from 431 tons of rock. Satisfactory progress is being made with the new plant which we hope to see running by the new year.

Mr. Partington was recently in the city and reports that the Oxford mine is looking really well, and he hopes to soon be producing some healthy bricks of gold.

Mr. Damas Touquoy was in town with a 69 oz. brick of gold.

The Golden Lode mine produced 759 oz. of gold from 91 tons of quartz, for the three months ending July 31st.

The Modstock mine produced 360 oz. of gold from 767 tons of quartz, for the three months ending July 31st.

During the month of August the two mills working at Goldenville produced over 300 oz. of gold, of which the New Glasgow Co. contributes nearly two-thirds.

British Columbia.

Boundary Creek.

While development work during the past month has been going on more slowly than could be wished, still a considerable number of sales have been made, and from the condition of affairs at present it seems probable that during the coming fall and winter such work will be quite extensive and systematic.

In Long Lake camp, Leslie Hill, for Mahon, MacFarlane & Mahon, of Vancouver, has bonded one-half interest in the "Denver Grande," for \$10,000; and a three-eighths interest in the "Jewel," 10 per cent. down. It is understood that these parties will commence development work as soon as the remaining interests are secured.

The "Amanda" has been bought by Charles Collins and associates for \$3,000. The five foot ore body on this property at present promises extremely well. The quartz in places has a uniform blue-black appearance, having been permeated by solutions of tellurides—principally hessite. On the same lead the "Alice," at the bottom of the 50 ft. shaft, shows 3 ft. of quartz, mineralized chiefly with pyrrhotite, the roughly concentrated mineral carrying over \$200 per ton in gold and silver.

In Providence camp, a considerable quantity of massive native silver is being taken out of the 8-inch vein on the "Combination."

Preparations are being made to continue the 50-ft. shaft on the "San Bernard," on which a 6-inch vein of extremely high-grade ore is being followed.

In Copper camp, on the "Copper," the cross-cut at the bottom of the 50-ft. shaft is in 70 ft., and for the last 30 ft. has been in good ore. It is expected the hanging wall will be struck in a few more feet. As on the surface the ore is brown hematite, with copper oxide and glance. The favorable appearance of the "Copper" will materially strengthen the confidence of mining men in the camp.

Twelve men are working on the Mather lode, putting up buildings and getting things in readiness for sinking.

On the "Skylark," under Foreman Barker, a main working shaft has been begun. The old one will be used as an air-shaft.

It is understood that work will be begun shortly on the "Silver King," which was bought in the early summer by Mr. Hogan of Spokane.

We are pleased to know that the Parrott Smelting Co. is again to commence operations. A small force of men is now at work on the "Stemwinder," pumping out shaft No. 2, with its several drifts, in preparation for work.

The bond on the "Snowshoe," which was held by Mr. Turner for outside parties, has been relinquished. While actions of this kind are always bad for a new and struggling camp, no importance should be attached to it in this case, as it is known that the "Snowshoe" was not held by Mr. Turner for the same parties who had the "Monarch" and "Gold Drop." No development or prospecting work—other than for a time with a diamond drill—was done on the property, and when the second payment was due on Sept. 1st they failed to meet it.

The sinking of the "Ironides" shaft is being steadily continued under contract.

In Wellington camp, on a number of properties, the summer work has shown up high-grade ore bodies. This is particularly the case on the "Golden Crown," on which a series of parallel and cross veins of, in most cases, high-grade pyrrhotite has been uncovered and opened up.

At the new galena strike above Rock creek the "Crown Point" was bought by Mr. Gedney, of New York, for \$2,500.

Quebec.

On 27th ulto. a fire at the Blackburn mine, Templeton, destroyed the engine and shaft houses and entailed a loss of ten barrels of culled mica and about ten tons of crude mica. Mr. Baker has had the new buildings reconstructed and everything is in working shape again.

A fine deposit of mica has been lately uncovered at the Wallingford pit, where, as usual, there is a good deal of activity.

It is reported that the mines of the Lake Gerard Mica Mining System in Quebec and Ontario will be turned over to an English syndicate. Mr. T. J. Watters is now in London negotiating the "deal."

The North American Graphite Co. had a fine exhibit of crude and manufactured graphite at the Central Canada Exhibition.

There is nothing new to report from the asbestos, chromic iron and pyrites mines of the Eastern Townships.

NEW COMPANIES.

The Mackenzie Lake of the Woods Gold Mining Co., Ltd. seeks incorporation under the Ontario Joint Stock Companies' Letters Patent Act, with the object of exploring and prospecting for gold mining properties in the districts of Rainy river and Lake of the Woods, and to develop and work the same. The operations of the company are to be carried on in the Province of Ontario, and the chief place of business will be in Toronto. Capital stock, \$500,000, divided into 50,000 shares of a value of \$10.00 each. Directors: E. MacKenzie, Thos. Shortiss, J. Flett, H. Lowndes, H. O'Brien, all of Toronto, Ont.

The Iron Capping Gold Fields Mining Co. of Toronto, Ltd. seeks incorporation under the Ontario Joint Stock Companies' Letters Patent Act with the object of mining, reduction and refining ores. The operations of the company are to be carried on in the Province of Ontario, and the head office will be at Toronto. Capital, \$1,250,000 divided into 1,250,000 shares of a value of \$1.00 each. Directors: A. W. McDougald, Chicago; J. Martin, Nelson, B.C.; G. Goldwin Smith Lindsay, J. A. MacIntosh, J. C. Hay, Toronto.

Rat Portage Gold Mining Co. seeks incorporation under the Ontario Joint Stock Companies' Letters Patent Act, with the object of mining in the Rainy river district and elsewhere in the Province of Ontario. Head office, Rat Portage, Ont. Capital stock, \$1,000,000, divided into 1,000,000 shares of a value of \$1.00 each. Directors: Geo. Barnes, D. C. Cameron, A. Carmichael, C. W. Chadwick, Rat Portage, and A. McDonald, Winnipeg, Man.

The Empress Gold Mining Co. of Ontario, Ltd. makes application for a grant of Supplementary Letters Patent to confirm a by-law passed by the directors of the said company on the 24th of August, 1896, to subdivide the existing shares of the said company of \$5 each, into shares of \$1.00, and to increase the capital stock thereof from \$100,000 to \$1,000,000 by the issue of 900,000 shares of new stock of \$1.00 each.

The Columbia Mining Co. of Canada, Ltd. seeks incorporation under the Companies' Act, Revised Statutes of Canada, for the purpose of mining in British Columbia. Capital stock, \$80,000 in sixteen thousand shares of a value of \$5.00 each. Directors: Geo. Broughall, Toronto; John McRae, Maggie McRae (spinster), Toronto; M. A. M. Henderson and W. J. Christie, Winnipeg. Chief place of business, Winnipeg, Man.

Rossland Homestake Gold Mining Co., Ltd. seeks incorporation with the object of purchasing the "Homestake" Mining Claim, Lot No. 936, Group One, West Kootenay, B.C., and carrying on mining operations elsewhere in the Province of British Columbia and the Dominion of Canada. Capital, \$1,000,000, divided into 1,000,000 shares of \$1.00 each. Directors: W. G. Johnson, D. M. Linnard, G. H. Bayne, all of Rossland. Head office: Rossland, B.C.

Crown Point Gold Mining Co., Ltd. seeks incorporation under the provisions of the Companies' Act, Revised Statutes of Canada, for the purpose of mining in the Province of British Columbia and elsewhere in Canada. Capital stock, \$1,000,000 in 1,000,000 shares of \$1.00 each. Directors: Geo. Gooderham, Toronto; Thos. Blackstock, Toronto; G. A. Stimson, Toronto; J. A. Finch, Spokane, Wash.; D. D. Williamson, Rossland, B.C.

Western Ontario Mining Co., Ltd. seeks incorporation under the Ontario Joint Stock Companies' Letters Patent Act, with the object of carrying on mining operations in the Rainy river district, and elsewhere in the Province of Ontario. Operations of the company are to be carried on in the town of Rat Portage. Capital, \$1,000,000 in 1,000,000 shares of \$1.00 each. Directors: C. S. Morris, A. H. Edminson, J. W. Humble, M. Kyle, H. Langford, all of Rat Portage, Ont.

The Gold Exploration and Development Syndicate of British Columbia, Ltd., has been registered in England with a capital of £12,000, in shares of £1, to carry on prospecting and exploring operations, etc., in British Columbia and elsewhere.

The Mines Trust of British Columbia, Ltd., was registered in London on the 31st ult., with a capital of £10,100 in £1 shares, to deal with mining and other properties in British Columbia and elsewhere.

The San Francisco Gold Mining Co., Ltd. seeks incorporation with the object of purchasing the San Francisco mineral claim, situate in the Tail Creek camp, West Kootenay, B.C., and any other mineral claims elsewhere in the Province of British Columbia. Capital, \$1,000,000 divided into 1,000,000 shares of a value of \$1.00 each. Directors: W. W. Dines, Rossland; Joseph Harris, John Dick, Winnipeg, Man.; J. B. McArthur, C. O'Brien Reddir, Rossland, B.C.

The California Gold Mining Co. seeks incorporation under the Registration of Foreign Companies, with the object of mining in the United States and in the Province of British Columbia. Capital, \$2,500,000 divided into 2,500,000 shares of a value of \$1.00 each. Head office, Spokane, Wash.

The Victoria Mining and Development Co., Ltd. seeks incorporation with the object of carrying gold, silver and other mineral operations in the Province of British Columbia. Capital, \$1,000,000, divided into 10,000 shares of \$100.00 each. Directors: John Bryden, Victoria; M. McGregor, Victoria; J. E. Martin, Victoria. Chief place of business, Victoria, B.C.

The British Lion Mining and Milling Co. seeks incorporation with the object of mining in the Province of British Columbia. Capital, \$600,000, divided into 600,000 shares of a value of \$1.00 each. Directors: John Kirkup, G. A. Fraser and W. G. Ellis, of Rossland, B.C. Chief place of business, Rossland, B.C.

The Rossland Red Mountain Gold Mining Co. seeks incorporation under the Foreign Companies' Act, with the object of mining in the United States and in the Province of British Columbia. Capital, \$1,000,000 divided into 1,000,000 shares of a value of \$1.00 each. Head Office, Spokane, Wash.

The Badger Tourmaline Consolidated Gold Mining Co. Ltd. seeks incorporation with the object of mining in the Province of British Columbia and elsewhere in the Dominion of Canada. Capital, \$1,500,000, divided into 1,500,000 shares of a value of \$1.00 each. Directors: R. F. Dodd, H. C. Walters, Rossland; John Lineham, Calgary. Chief place of business, Rossland, B.C.

Noble Five Consolidated Mining and Milling Co. seeks incorporation under the Foreign Companies Act with the object of working mines and mineral lands in the United States and in the Province of British Columbia. Capital stock, \$1,200,000, divided into 1,200,000 shares of a value of \$1 each. Head office: Spokane, Wash.

Seymour Creek Gold Mining Co. seeks incorporation for the purpose of mining in the Province of British Columbia and elsewhere in the Dominion of Canada. Capital, \$1,000,000, divided into 1,000,000 shares of a value of \$1 each. Directors: H. Heffering, Vancouver; F. S. Timberlake, Vancouver; S. I. Timberlake, Vancouver.

Golden River, Quesnelle, Ltd. seeks incorporation under the Foreign Companies Act for the purpose of mining in the Province of British Columbia and elsewhere in the Dominion of Canada and the United States. Capital, £350,000, divided into 350,000 shares of £1 each. Head office: 6 Great Saint Helens, London, Eng.

Copper Belle Gold Mining Co., Ltd. seeks incorporation with the object of purchasing the mining claims recorded as "The South Falls and Copper Belle mining claims" situated in Trail Creek mining division, West Kootenay district, and to mine and work any mineral lands elsewhere in the Province of British Columbia. Capital, \$1,000,000, divided into 1,000,000 shares of a value of \$1 each. Directors: N. Olsen, Edward Baillie, C. F. Sears, F. D. Sears, of Rossland, B.C.; James Haddock, J. H. Leech, John Russell, John Thompson, Winnipeg, Man.

Collona Gold Mining Co., Ltd. seeks incorporation with the object of mining in the Province of British Columbia. Capital, \$1,000,000, divided into 1,000,000 shares of a value of \$1.00 each. Directors: G. E. Pfunder, A. Klockmann, and F. M. McLeod, Rossland, B.C.; L. Linemann and Chas. Schmidt, Butte, Montana. Chief place of business, Rossland, B.C.

The Picton Development Syndicate, Ltd. seeks incorporation with the object of mining in the Province of British Columbia and more particularly the land, mines, beds of ore and mining rights known as the "Picton Mineral Claim," situate in the Nelson mining division of the district of West Kootenay. Capital, \$15,000, divided into 3,000 shares of a value of \$5 each. Directors: J. E. Turner, Nelson; S. M. Okell, Victoria; J. F. Pearson, Manchester, Eng. Chief place of business: Nelson, B.C.

Eastern Star Gold Mining Co. seeks incorporation under the Foreign Companies Act with the object of carrying on mining operations in the precious metals in the territory of the United States and in the Province of British Columbia. Capital, \$500,000, divided into 500,000 shares of a value of \$1.00 each. Head office: Spokane, Wash.

The Gold Hill Quartz Mining Co. of Fairview, Ltd. seeks incorporation with the following objects: The acquisition by purchase or otherwise of the mineral claim known as the "Gold Hill" in Fairview camp in the Osoyoos division of Yale district, and to mine and deal in mineral lands elsewhere in the Province of British Columbia. Capital, \$750,000, divided into 750,000 shares of a value of \$1.00 each. Directors: A. A. Davidson, Wm. A. Dier, Arthur Neaves, Victoria, B.C. Chief place of business: Victoria, B.C.

Delacola Gold Mining Co., Ltd. seeks incorporation for the purpose of mining in the Province of British Columbia and elsewhere in the Dominion of Canada. Capital, \$1,000,000 divided into 1,000,000 shares of a value of \$1.00 each. Directors: E. W. Johnson, R. Thomson, John Donahoe, Geo. Hering, Geo. W. Myers, all of Rossland, B.C. Head office, Rossland, B.C.

A Visit to Goldenville, N.S.

By our Halifax Correspondent.

We recently paid a visit to that celebrated old-time gold district of Goldenville, which was the mainstay of the early gold mining operations in this Province and which is giving promise of once more taking a leading place in the gold industry of Nova Scotia. Driving up from Sherbrooke, the first thing to catch our eyes was a very fine shaft-house being erected by the Blue Nose Co. This company is erecting a very substantial and elaborate plant, consisting of a lofty shaft-house, and a well built tramway to the mill about a quarter of a mile south of the shaft-house. The ore coming from the shaft-house will be dumped into a large hopper outside the mill, below which is a modification of the Gates crusher. The crushed rock will then be elevated to the mill by an endless bucket belt. The mill, a 20-stamp one, has been built by Fraser Brothers of New Glasgow, and is as able a looking mill as could possibly be desired. The frame is very substantial; the engine which will drive the mill is a vertical double cylinder engine, built by Matheson & Co. of New Glasgow, and is set on very sound foundations. There is a solidity about the whole plant which gives it the appearance of being there to stay and do good work. With regard to the general arrangement of the plant, we cannot say that it meets with our approval, considering the opportunities given by the site; it struck us that the plant might easily have been so arranged that the ore should have considerably less handling than will be necessary with the present arrangement. The winding gear is rather a "dodgy" arrangement, consisting of friction gear and block brakes.

Leaving the Blue Nose Co. property we came to the property being operated by that sterling miner, Mr. James A. Fraser. In this property there are 800 feet of ground opened up underground. The mill is a 10-stamp one, with an automatic feed of Mr. Fraser's own design which works admirably. This mine is showing up very well considering the small milling capacity, and is yielding from 180 to 200 ounces of gold per month. Mr. Fraser had some very handsome sights of heavy gold which had come up from the Canada lead the day we arrived. In the eastern end of the property near the road Mr. Fraser was opening up a huge lead of quartz heavily charged with mispickel. The extent of the lead is not yet known, as only one wall had been reached, but it must already be about 8 feet.

West of Mr. Fraser's property comes the batch of areas owned by Mr. George Stuart *et al.*, and here a sight meets the eye which is to be seen nowhere else in Nova Scotia. Huge piles of slate are dumped in all directions, reminding us of the Welsh slate quarries. It is from these areas that at least three-quarters of the gold produced in Goldenville has come. The huge belts were for the most part worked by open cut, and have been excavated for a width of 60 feet in places. The tremendous dumps of slate piled up on all sides show the amount of stuff which has been handled, while the decaying ruins of old stamp batteries form a pitiable sight when it is known that these mines were given up because from 4 to 6 pennyweights of gold per ton was considered too low-grade to work at the time these mines were abandoned. These belts have really only been scratched in the past; we believe the deepest workings on the big belts is less than 150 feet, while no attempt was made to recover anything but free-milling gold. With a view to ascertaining what the loss in the tailings amounted to, we took two sections from the tailing dump about 100 yards below the foundations of the old Dominion crusher, and these gave a little over 2 dwts. of gold to the ton.

We also took a sample of heavily mineralized slate from the Palmerston dump, which assayed over 2.5 dwts. Turning up back returns, we find that Goldenville was in its prime during the years between 1866 and 1880 inclusive, when the yearly returns were never less than 4,000 ounces, while the average yearly return for these fifteen years amounted to the very respectable amount of 6,190 ounces. The maximum yield was in the year 1867, when 9,464 ounces of gold were obtained from 7,378.5 tons of ore.

When we come to consider that these figures represent only free-milling gold, and probably not all of that, and further that these large intercalated belts have only been worked to a very limited extent, the possibilities of Goldenville as a future gold field are a long way ahead of anything as yet discovered in Nova Scotia, or as a matter of fact anywhere in the Dominion of Canada, and we sincerely hope that the day will soon come when this camp will be operated with its old vigor combined with all the advantages of modern and economical practice.

We wish to record our sincere thanks to Mr. Don F. Frazer and Mr. Edmund Jenner, who showed us round the camp and made things generally pleasant for us during our stay at Sherbrooke.

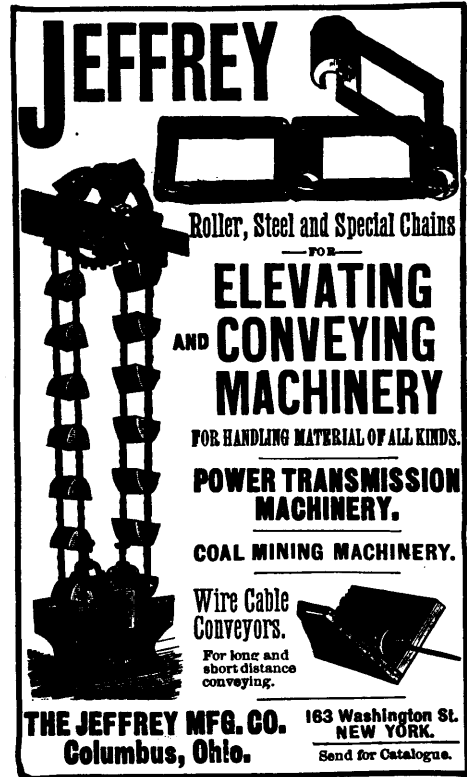
"Sharks" and Shareholders.

(From *The Province*.)

Of late much dissatisfaction has been expressed publicly and privately regarding the methods adopted by certain mining companies. It would appear that many of the corporations which do business in this province are organized under the laws of various States across the border. Perhaps the most objectionable feature of the laws under which the companies referred to are formed is that the directors or trustees for the time being seem to have the power to dispose of the whole assets of the company, not only without the assent, but in defiance of the wishes, of the shareholders. In the hands of unscrupulous men there is actually no limit to the frauds that may, under these circumstances, be perpetrated on the innocent holders of shares. In a recent notorious case it seems that the whole asset of a company, a mine, was sold to a friend of the directors at a figure far below that which could have been obtained from outside parties, the object being, of course, that the directors should collusively acquire a valuable property at a quarter, say, of its value, and then reap a large profit for themselves, leaving the debts to be distributed among the victimized shareholders.

It is difficult to understand how transactions of this nature could be upheld by the courts of any country, however callous to unprincipled methods. But it is a poor consolation to the holder of a few shares in Rossland to know that if he institutes expensive legal proceedings in Spokane he may get a declaration as to his rights which it will cost him more to enforce than his claim is worth.

As matters stand now, we are informed that only the barest formalities are required to enable a company formed in any part of the United States to carry on business in British Columbia. This is not as it should be. While *The Province* is, on principle, opposed to anything which tends to restrict trade, yet at the same time the public interest must be served. It is not at all unreasonable to require that foreign companies which propose to do business here should at least give some guarantee that they are more or less responsible, and that they are incorporated under laws which do not confer authority on the governing body to swindle the public in the most unblushing manner.



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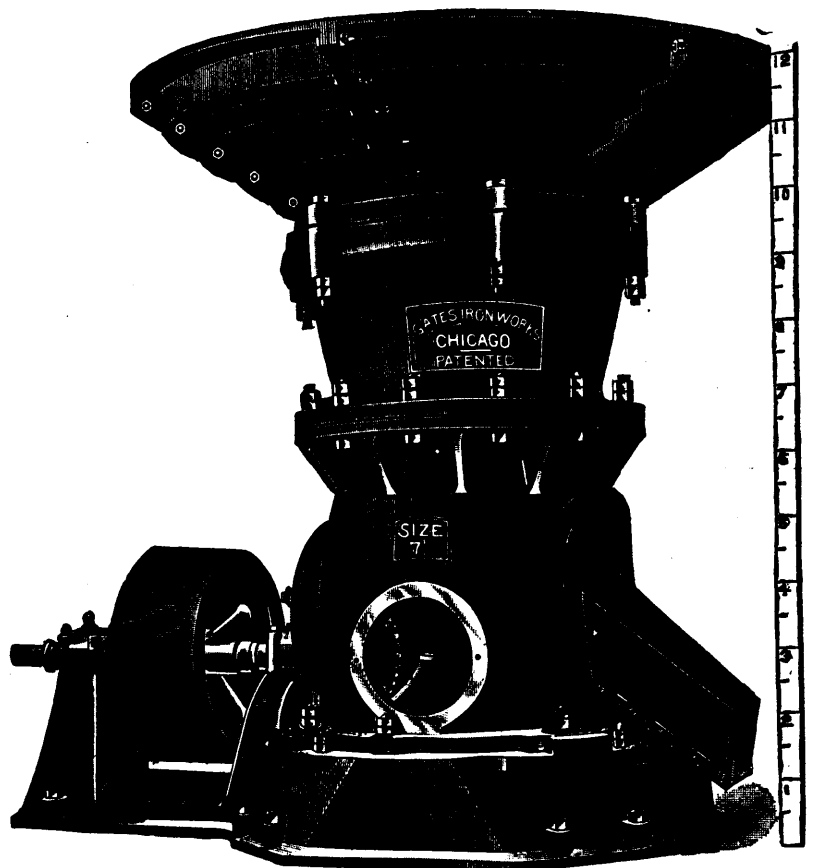
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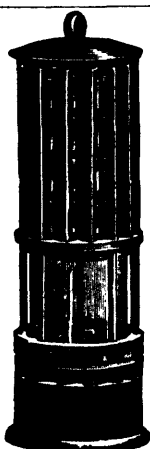
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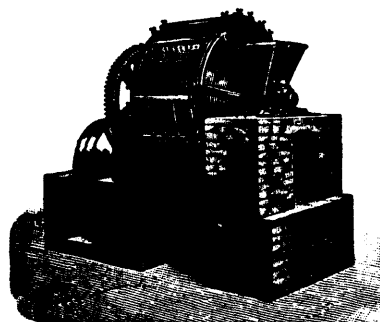
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For further information see the calendar of Queen's University for 1894-95, p. 117.

4. *Prospector's Course.*

The School offers to Mine Foremen, Assayers, Prospectors and Mining Men generally, Special Courses of Instruction beginning January 8th, 1896, and continuing eight weeks.

5. *Extramural Classes for Prospectors and Mining Men.*

Lecturers will be sent to Mining Centres to conduct Classes in Elementary Chemistry, Mineralogy and Geology as applied to the discovery and winning of valuable minerals.

The School is provided with well equipped Laboratories for the study of Chemical Analysis, Assaying Blowpiping, Mineralogy, Petrography and Drawing. In the Mining Laboratory recently built the operations of Crushing, Amalgamating, Concentrating, etc., can be studied on a large scale.

The BRUCE CARRUTHERS SCHOLARSHIP (value \$200 per annum) will be awarded in May. Its object is to aid one who has had some experience in amalgamating, etc., in acquiring a good education in Mining Engineering. The conditions of the award will be made known on application to the Director or the Bursar.

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Under the provisions of chap. 1, Acts of 1802, of Mines and Minerals, Licenses are issued for prospecting Gold and Silver for a term of twelve months. Mines of Gold and Silver are laid off in areas of 150 by 250 feet, any number of which up to one hundred can be included in one License, provided that the length of the block does not exceed twice its width. The cost is 50 cents per area. Leases of any number of areas are granted for a term of 40 years at \$2.00 per area. These leases are forfeitable if not worked, but advantage can be taken of a recent Act by which on payment of 50 cents annually for each area contained in the lease it becomes non-forfeitable if the labor be not performed.

Licenses are issued to owners of quartz crushing mills who are required to pay

Royalty on all the Gold they extract at the rate of two per cent. on smelted Gold valued at \$19 an ounce, and on smelted gold valued at \$18 an ounce.

Applications for Licenses or Leases are receivable at the office of the Commissioner of Public Works and Mines each week day from 10 a.m. to 4 p.m., except Saturday, when the hours are from 10 to 1. Licenses are issued in the order of application according to priority. If a person discovers Gold in any part of the Province, he may stake out the boundaries of the areas he desires to obtain, and this gives him one week and twenty-four hours for every 15 miles from Halifax in which to make application at the Department for his ground.

MINES OTHER THAN GOLD AND SILVER.

Licenses to search for eighteen months are issued, at a cost of thirty dollars, for minerals other than Gold and Silver, out of which areas can be selected for mining under lease. These leases are for four renewable terms of twenty years each. The cost for the first year is fifty dollars, and an annual rental of thirty dollars secures each lease from liability to forfeiture for non-working.

All rentals are refunded if afterwards the areas are worked and pay royalties. All titles, transfers, etc., of minerals are registered by the Mines Department for a nominal fee, and provision is made for lessees and licensees whereby they can acquire promptly either by arrangement with the owner or by arbitration all land required for their mining works.

The Government as a security for the payment of royalties, makes the royalties first lien on the plant and fixtures of the mine.

The unusually generous conditions under which the Government of Nova Scotia grants its minerals have introduced many outside capitalists, who have always stated that the Mining laws of the Province were the best they had had experience of.

The royalties on the remaining minerals are: Copper, four cents on every unit; Lead, two cents upon every unit; Iron, five cents on every ton; Tin and Precious Stones; five per cent.; Coal, 10 cents on every ton sold.

The Gold district of the Province extends along its entire Atlantic coast, and varies in width from 10 to 40 miles, and embraces an area of over three thousand miles, and is traversed by good roads and accessible at all points by water. Coal is known in the Counties of Cumberland, Colchester, Pictou and Antigonish, and at numerous points in the Island of Cape Breton. The ores of Iron, Copper, etc., are met at numerous points, and are being rapidly secured by miners and investors.

Copies of the Mining Law and any information can be had on application to

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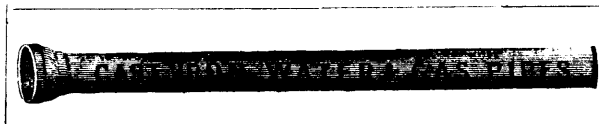
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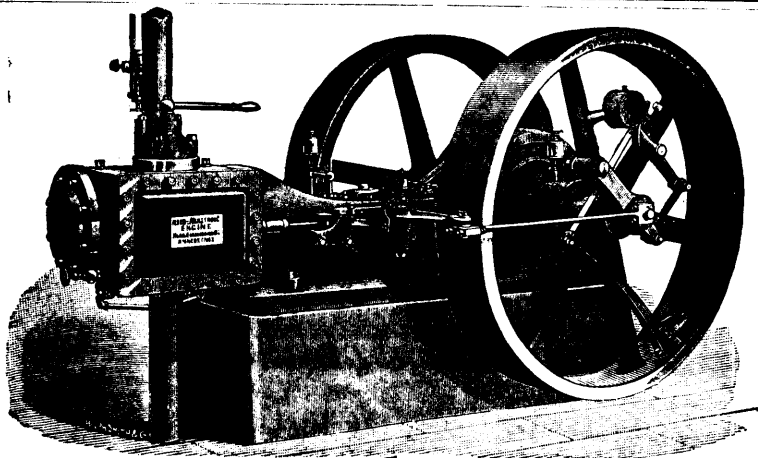
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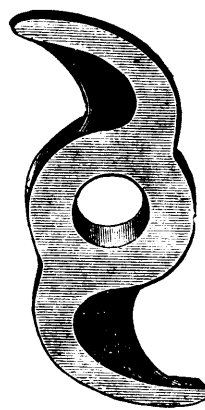
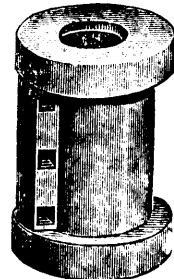
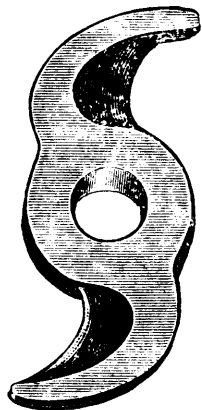
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