

THE TREATMENT OF OUR ORES

The Pohle-Croasdale Process May Reduce the Present Cost of Treatment One-Half--An Interesting Interview With Bernard Macdonald

That the large body of low grade ores now being developed or already blocked out in the mines in this camp will eventually be mined and treated at a profit to the proprietary companies...

In order to secure information upon this subject to lay before its readers The Miner called upon Bernard Macdonald, general manager of the Le Roi No. 2 and the Roseland-Kootenay Mining Company, and obtained the following review of the situation from that gentleman, which we think will interest all concerned.

"I am satisfied that the existing conditions, which leave little or no profit in the mining and treatment of the low grade ores, will be so modified in the near future that the large deposits of such ore in the mines in this camp can be benefited at a substantial profit. Everybody familiar with the history of the mining and smelting in this camp knows that already the cost to the mines for smelting their ores is less than one-half what it formerly was, while the cost of mining is also materially reduced.

What has been accomplished toward the cheapening of production is due entirely to the expenditures of large amounts of capital in the systematic development of the mines and their equipment with suitable plants of modern machinery.

"The enlargement of smelting plants and their equipment with labor-saving devices, together with the use of the cheaper but superior quality of coke mined and made in the province, has also largely contributed to the result. And a still further lowering of the cost of mining and treatment of ores of this camp will be made and is expected by everyone who is studying the conditions.

"To illustrate: The shipment and sale to the Northport smelter of the ore from the Le Roi No. 2, amounting to 5000 or 6000 tons monthly, is made under a contract which calls for a direct freight and treatment charge of \$6 per ton and an indirect charge amounting to something over \$2, making a total charge against the metal values in the ore of more than \$8 per ton after it has been loaded into the railway cars at the mine. Before it is loaded into the railway cars the cost of mining it and the cost of carrying on the development of the deeper horizons of the ore shoots have to be met. On account of the extensive program of development work carried on by the company the costs of mining and development, sorting the ore and loading it on the cars, amount to something like \$4 per ton of the ore shipped. The total cost, therefore, that must be deducted from the gross value of the metals in the ore shipped from the Le Roi No. 2 under present conditions to pay the mining, smelting and taxes amount to something like \$12.50 per ton. This is what is termed the 'costs of realization.' The difference between these costs and the average gross value in the ton of ore shipped constitutes the present available profit of the company. It is true, however, that a large quantity of second class ore coming from development and being stored from the shipping ore is being sorted in each second class ore dump, which will, eventually, yield a profit to the company, as the second class ore dump on the Le Roi is now doing. But for the present this class of ore would leave but a small amount of profit to the company, and is therefore not considered as an available source of revenue.

AN INTERESTING COMPARISON. "The ore shipped by this company averages about \$17 per ton in metal values, which leaves a profit of \$4.50 per ton to the company. In the extraction of the present grade of shipping ore large bodies of the lower grade ore are blocked out and left standing in the mine for future extraction. For although under present conditions the Le Roi No. 2 ores containing \$12.50 per ton have to be treated as worthless, in the future ore of such grade will yield handsome profits. At the Le Roi \$12.50 ore yields large profits, while at the Le Roi No. 2 that grade of ore yields no profit whatever.

"The explanation of this apparent anomaly in two properties lying side by side and containing the same character of ore is that the one property is equipped with up-to-date mining machinery and a smelting plant of its own, while the other does not possess these advantages. Except for the fortunate possession of high grade ore shoots the Le Roi No. 2 would now be in a somewhat similar condition as that occupied by the Le Roi in December, 1899. At that time the company ascertained that for the 14 months previous, during which the property had been operated by the London company, over 36,000 tons of ore, or an average of 250 tons daily, had been mined from that property and treated at the Northport smelter without leaving one penny of profit to the company. And this notwithstanding the fact that the ore shipped during that period ranged in value from \$13.66 to \$17.33 per ton.

"The extensive development since made on the Le Roi and its equipment with large up-to-date plants, mining and smelting machinery, has made it possible for ore from that mine to yield only \$12.50 per ton in metal values, first, one of crushing the ore, second, roasting the ore and third, condensing the values. It is entirely automatic from the discharge of the ore into the roasting furnace, and can, of course, be made largely automatic in the state of crushing. It is also of such extreme

simplicity that the expense of conducting the same at any point where costs are not excessive, and at a rate varying between 100 and 500 tons of ore per day, will range from \$2 to \$3.50 per ton. Practically the entire metallic values will be saved in lead and copper, and the recovery of value in the cases of gold and silver in the ore will be 95 per cent and 100 per cent. The very high metallic recovery effected in this process is even a more important consideration, from a commercial point of view, than the low cost of treatment.

"From the above description the process will be understood to be extremely simple, free from complications or blind reactions, and the cost of these several operations in a complete plant which will work ONE HUNDRED TONS DAILY would be approximately as follows:

Crushing the ore to one-eighth mesh... \$0.40
Drying ore and mixing salt... .65
Roasting ore and removing waste cinders... 1.00
Condensing and collecting... .45
Electrolytic precipitation... .75
Incidental expenses... .25
Total treatment cost... \$3.50

"This estimate of cost of treatment is maximum and can be reduced in nearly every case where the conditions are at all favorable. "The Pohle-Croasdale process will yield the metal contents of base ores in the following ratio:

Copper extracted and returned as pure anodes... 98
Gold extracted and returned as pure... 95
Silver extracted and returned as pure... 95
Lead extracted and returned as pure pig... 98

"These differences are so great as to call attention in detail to the real losses common to western mines, whose products are principally base ores—a loss partly in the freightage to a distant smelter and partly in the smelting of the large percentage of useless materials in this class of ores. When it is considered that the metal contents of ore rarely exceeds five to eight per cent of the total tonnage (in the case of the Roseland ores about 1.5 per cent) and that 92 to 95 per cent of the ores are actually waste, yet are freighted and smelted to recover the lesser amount, the reasons for failure in so many cases are apparent. Even under the most favorable circumstances the smelting process is a complex, wasteful and always a very expensive method of concentrating the small amount of metal values into sale products (bullion), repeated operations upon a portion of the products being essential to secure success.

"For the first time the opportunity for owners of base ore mines to become independent of the usual concentration methods, whether by mechanical or smelter methods, and the certainty of recovery of substantially all the metal values in their ores at the mines and in pure metal form is offered.

of ore, and to secure what is generally more valuable than any such reduction, to-wit: an increased metallic recovery, which, as stated, averages 95 per cent of the original full value of the ore.

LE ROI NO. 2 ORES BEING TESTED "We are having the low grade ore of the Le Roi No. 2 and the Roseland Kootenay Company tested by the newer methods mentioned. From the data that is accumulating I am sanguine that as much profit will eventually be made from Roseland Kootenay ores going \$9.00 per ton, as are now being made from Le Roi No. 2 ores going \$17.00 per ton.

"In this estimate, do you take into account the governmental burdens of taxation, direct and indirect now imposed on the industry? "No, and I should qualify the above statement by saying that the favorable outlook for the mining industry of this province, above outlined, would not be possible if the governments, provincial and Dominion, persist in the present insane policy of unjust discrimination against it. But, I am satisfied that the closing down of the producing mines that is now going on throughout the province, the practical abandonment of the province by the prospector and the investing capitalist, the depopulation of the mining camps and the effect of all this on the general prosperity of the larger cities of the province, will give our legislators such a practical demonstration of the result of the policy they have pursued for the last four years, that I look for the repeal of a radical modification of the present legislation, which is killing the mining industry.

THE TWO PER CENT TAX. "I refer to the so-called 2 per cent tax, which in the case of low grade ore means a tax of from 15 per cent to 30 per cent of the possible profit, and also to the modification of other provincial legislation, that is hampering and harassing the industry. It is also reasonable to expect a very radical modification of the Dominion duty which imposes from 25 per cent to 30 per cent on all mining supplies and machinery imported. The people realize, and even some of the government officials are admitting, that no industry could survive such legislative burdens. These laws have been patiently tested, and under them the industry is gradually dying out. The law of the survival of the fittest has been tested on the mines of this province, and very few have been able to survive, in the sense of independent existence.

"I am informed and believe that the condition of the mining industry is being serious and remedial legislation is being demanded. "The burdens imposed by law appear to be the only obstacles now standing in the way of the prosperity of the mining industry, and if these are removed the grand possibilities of this city and the province will be realized."

LATE NEWS FROM THE SMELTER CITY (Special to the Miner.) TRAIL, B. C., Sept. 20.—The Trail Rifle Association shot its first match today, over the new range, which has been built across the Columbia river, with the firing stand on the Trail side and the butts on the opposite side. The old range was considered dangerous, owing to the proximity of the road, along Stoney creek, in back of the butts, and the matter of collecting subscriptions and building a new range, was taken in hand by A. E. Steele, a member of the association. The firing stand is on the cribbing at the foot of the smelter, and the closest range instead of being 200, is 275 yards. Trail lead refinery about 200 is made to offset which the bull's eye is made larger. The 275, 500 and 600 yard ranges each have separate targets and separate butts, the markers being protected by a breastwork of cribbing, about eight feet long, and six to eight feet thick, filled with sand and boulders. The match today resulted in the following scores:

A. Donaldson... 87
Mrs. McKenzie... 85
Morrin... 83
Merrick... 79
Weaver... 78
Brandon... 62

A. B. McKenzie, accompanied by Mrs. McKenzie, will leave Monday for the Okanagan country, where Mr. McKenzie will engage in ranching. Mr. McKenzie was one of the earliest residents of Trail, and he and his wife were both active workers in the Presbyterian church. D. McKillop last evening presented the departing members with a neatly engrossed address, accompanying it with a set of military buttons for Mr. McKenzie and a handsome manicule set for his wife.

Dr. William Valentine, who was in charge of the Boston and Montana company's electrolytic copper refinery at Great Falls, will lead refinery about October 1, returning Dr. Kern, who returns to New York, with A. G. Betts. Marlon Steele has gone to Pullman, Wash., to take a course in the State agricultural college and school of science.

J. Netterfield, who resigned the management of the Trail branch of P. Burns & Co.'s business, is to take charge of the Cranbrook branch. Mrs. Martha Haughton, wife of the late Thomas Haughton, and mother of the late Martha Westcott, of this city, died last Monday at Everett, Wash., where she was visiting. Mr. Westcott went to the coast, to look after the funeral.

Mrs. Ernest Lyons, of Spokane, is visiting her sister, Mrs. Abercrombie. Frank Sandon, of Moscow, Idaho, has come to Trail to take a position in J. D. W. Viet's store. J. D. W. Viet has returned from a vacation trip to Nova Scotia. Mr. and Mrs. W. H. Aldridge are home from Esart.

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THE GOVERNMENT AND MINING

(Vancouver Province.) An outspoken expression of opinion on the attitude of the government of British Columbia towards the mining industry of the province, by men who thoroughly understand the industry and are at the present time in actual charge of great working properties, is what all who are interested in the development of the country have been waiting expectantly. With the views of mere theorists we are not greatly impressed as a rule, but the statements of a man in a position of great responsibility, and one who has reputation and standing to lose by utterances which might not be carefully considered, will be listened to with attention, and what he has to say will carry much weight. For this reason the address delivered by Mr. Edmund B. Kirby before the Canadian Mining Institute last Friday in Nelson on "The Influence of Government on Mining" will be read with interest. Mr. Kirby is the general manager of the celebrated War Eagle and Centre Star properties at Roseland, and has been in charge of them for three years. He possesses therefore not only a comprehensive knowledge of the mining industry, but has an intimate practical acquaintance with it as carried on in British Columbia, and his address necessarily deals with the influence of our local government on the working mines of the province.

As Mr. Kirby himself says in opening his address: "In most mining districts of the world the difficulties which we as engineers have to confront are mainly business, technical problems. Methods and economies in mining, transportation, milling and smelting, studied both from the scientific and business side, absorb our attention."

"We know the outside world holds the belief that our future, as a rich and populous country, depends almost entirely on the extent and value of our mineral deposits. While we are not prepared to concede entirely with this view, we must admit that our mineral development will have a great deal to do with our continued progress and prosperity. In view of this undeniable fact, it would be the part of wisdom on the part of our government to foster and encourage the industry in every way possible.

"Instead of doing so, however, Mr. Kirby charges that the whole effort of legislation is to oppress mining. "Now the British Columbia mining industry is unique in the world," he says, "not only in its entire lack of state recognition and fostering, but in the fact that difficulties imposed by state economic overhauling in importance all the ordinary technical and business problems which the mining men have to deal. It affords today a curious and interesting illustration of the injury wrought by unwise government, and also the reaction of repressed mining upon commerce and other industries. These effects are emphasized by contrast with the present prosperous condition of the other provinces of the Dominion and also of the United States."

"This is certainly a serious condition of things, if it is true, and it calls loudly for immediate rectification. Speaking of mining exploration and enterprise in British Columbia, Mr. Kirby quotes from the memorial of the British Columbia Mining Association of June 28, 1901, as follows: "The development of these resources, begun a few years ago so auspiciously, has been brought to a practical standstill, and whereas a few years ago the mountains were swarming with prospectors, today these pioneers of the mining industry have nearly disappeared. The flow of capital into the province has been practically cut off, the metal production at present is decreasing, numbers of producing mines have closed down, and those operating have, with few exceptions, ceased to pay dividends; the working mines are struggling under heavy burdens which are accumulating each year. It is now frankly admitted by mining men that the industry is prostrated in many mining divisions and that its condition is rapidly becoming worse."

Mr. Kirby says that allowing for all the reaction from the mining boom, the association accordingly ascribes the increasing paralysis to its two main causes—excessive taxation and oppressive legislation, and he continues:

"At present, conditions are even worse than those then described. Prospecting and the development of new deposits to replace those exhausted, has practically ceased. Of 14,328 crown-granted and recorded claims held on December 31, 1901, only 78 yielded ore in excess of 100 tons total production for the year. This is about one claim out of every two thousand held. The bulk of the tonnage was confined to a dozen or so mines, most of these operating at a loss. The increased metal statistics of 1901, 1902, and 1903, aggregated \$11,849,000 for 1900, was due entirely to two mines, neither one of which yielded dividends, and one of which has announced a large increase in its debt. It is not of interest here to go into details about the oppressive and threatening legislation which in British Columbia has so characterized the dealing of the state with its chief industry. What is of interest is the spectacle, unknown elsewhere in the Dominion or in the Empire, and probably unparalleled in the world, of a mining industry trying to exist under a burden of taxation which amounts to between twenty and thirty per cent of its gross product. In the remarkable state of affairs the fact that mining exists at all is the strongest evidence of the value of British Columbia ore deposits, and of the future which awaits the industry here whenever these artificial burdens are removed. . . . Even if the total load of mining taxes at all is the strongest evidence of the value of British Columbia ore deposits, and of the future which awaits the industry here whenever these artificial burdens are removed. . . . Even if the total load permitted it, low grade ores must be mined for the most part untouched on account of the so-called 2 per cent tax on the gross output of mines. This tax is only one item in the total mentioned above, but it has the peculiar effect of exacting an increasing proportion of the net profits when applied to the low or grade of ore. For instance, on the mining grades of Roseland, it will seize anywhere from 10 to 20 per cent of the net profits. This bars Treadwells in British Columbia."

It is a matter of regret that Mr. Kirby does not mention more specifically the evils which should be removed and lay down a policy which would be of aid to the industry, if pursued by the government. The two per cent tax, it is generally conceded, is a burden which must be removed if the industry is to flourish. We should like to have a clear conception of what other steps must be taken to encourage and foster the mining industry in this province, if it is to be kept out of its sunshine" is too general, and the fault with advice offered by mining engineers to the government in the past, is that it has been too general.

Mr. Kirby then concludes with a tribute to the mineral richness of the country: "But notwithstanding the gloom of today," he says, "we mining men, looking far beyond the present, have a clear view of the future grandeur of the commonwealth of British Columbia. We know its wonderful natural resources, the character and energy of its people." And he very properly urges his hearers to steadily press the fight for reform.

POOR KIND OF JUSTICE. American law would not permit a southern woman to supplant the sheriff in the execution of a negro murderer, but the statutes were generously relaxed to allow her to cut down the dead body. The enormity of the crime and the emotions of the bereaved woman but slightly modify the brutality of the spectacle which followed the execution. The instincts which inspired the woman to officiate at such a duty were not less unnatural to womanhood than the instincts which provoked the murderer. Dispensers of summary justice in the Southern States will persist in interpreting the brutal and sensational crime. Yet the brutality of the criminal is repeated in the name of justice. Pascreaux, the forerunner of the offence, is reflected in the penalty inflicted. The true restraint of crime is to be found in the calm, deliberate consideration of an offence, not in the spectacle of a brutal violence or in womanhood debating itself on the altar of retribution. Toronto Telegram.

NEW RUNNING RECORD. LONDON, Sept. 20.—Alfred Shrubb ran four miles at the Red Hill sports ground today in 19 minutes 25.45 seconds, establishing a new world's record.

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NELSON, B. C. den party had of tings at Nelson of they have had it being exceeded Vancouver. The of adherents of I were much in e

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COAST-KO RAIL (Special t GRAND FORK James H. Kennet the V. V. & E Lupfer, chief loc Great Northern r three weeks ago sance of the pr railway between coast, have reach B. C. They cov tance on foot. A Mr. Kennedy tod had traversed the C. P. R. in favor ilkameen district mountains to H main line of the route which Hon, erment engineer practicable. Mr. mated that he a starting eastward or, near the int line. This route e lake and a tribu river, and is rega

THE SNOWSHO A. J. McMillan S built Soc GRAND FORK 'Anthony J. McMe aging director, as London, England Snowshoes mine, cal days. On Th Cascade for the the Cascade pov was devoted to Granby smelter. "As I anticipated we have been see provisional, sort of headquarters at. now has a ship tons daily, we v took a look at the plant at Bounda ing at a site at flow, Dr. Jones, myself then fou go to Cascade plant there and buy power for the shoe mine provi exceed that of ste or so before the Boundary ma electricity. We t smelter site at Watsonford and J Land at once, an five weeks, when port to our boat will decide the and where the p built. That's a m er or later may sone conclusion."

MASS ME Citizens of Col V. V. & E (Special GRAND FORK 'A mass meeting tumbia, Mayor M held tonight. R railway committe ell at Ottawa, o of the V. V. & across the Kettie C. P. R. tracks smelter, and for m's, were adopte