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The Canadian Mining Journal

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CIRCULATION.

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STEEL AND COAL.

Some time ago we alluded to the lamentably personal tone of the quarrel between the Dominion Iron & Steel Company and the Dominion Coal Company. More recently we pointed out that the Dominion Coal Company, through its president, had made definite overtures in the direction of a peaceful settlement, and that these had been rejected by the Dominion Steel people with but scant show of courtesy. Not only was this the case, but, possibly with the object of displaying their entire confidence in an ultimate victory, the Dominion Steel directors have failed to put forward any adequate counter-offer.

As bearing upon one of the most important phases of the Dominion Steel Company's arguments, we recommend to our readers' attention the article in this number of the Canadian Mining Journal describing Dominion Colliery No. 6. Mr. Gray touches upon the "Phalen seam" controversy. Our readers may judge for themselves as to the conclusiveness of the facts as there adduced.

Instances such as the "Phalen seam" dispute, in the light of later developments, prove the unreason of all such costly lawsuits as that of Steel vs. Coal. Whether Dominion Coal or Dominion Steel was to blame originally is insignificant in comparison with the urgent question as to why the dispute was allowed such a protracted existence. The country at large has an indisputable right to demand an answer to this.

The moment that quarrels of this kind, involving directly and indirectly many millions of dollars, reach the courts and high-priced legal lights are engaged to fight the case out, an amicable and equitable settlement becomes almost impossible. It is our firm belief that such quarrels should be taken entirely out of the hands of hot-headed principals and referred at an early stage to a properly constituted Conciliation Board, a body analogous in most respects to that which deals with difficulties between employers and employed, but clothed with absolute power to give a final and binding decision. Had such a board been in existence Canada would have been spared two years of undignified bickering.

MODERN STAMP-MILLS.

A South African stamp-mill, which commenced crushing in September, is notable in several respects. The mill framework is constructed of steel. The battery is driven in units of five stamps by individual motors. There are 300 stamps. Each stamp weighs 1,750 pounds.

Steel construction for large stamp-mills is now an established practice. Self-contained units, in which

the cumbrous cam-shaft of the past is replaced by one that does duty only for five or ten stamps instead of twenty or thirty, are logical necessities. Repairs are lessened and lightened. A break-down involves only the unit concerned, and great flexibility is attained in large installations.

Not only do these changes facilitate the every-day running of the mill, but they also make the mine manager's work lighter. Parcels of ore from different parts of the mine can be treated separately without loss of time, and on all the ore crushed a closer watch can be kept. Incidentally also there is a great saving of power in any such system of controllable units.

MIND AND MATTER.

Secular education has made giant strides in latter years. The principles of evolution have been accepted by scientist and theologist alike, as the foundation of modern knowledge. Geology, chemistry, theology, have become but naked equations. The mighty groanings and laborings of Mother Earth have been measured, recorded, and analyzed. We know that certain climatic and certain physiographic environments produce Anabaptists, that others bring forth Mahometans. Here, the Heresy-trial will flourish; there, the Inquisition.

And so we are filled with conceit of ourselves. In our pride we forget that there be many things of which we have but dim knowledge.

All of which leads to the recital of a tale that is worth telling—a tale that proves that man in his direst need must depend not upon books or brains or muscle, but upon a psychic something that is latent in all of us, developed in but a chosen few.

Upon another page is recorded the progress of that flying squadron of excursionists, which, piloted by the Canadian Mining Institute, traversed so recently our fair Dominion. Mines, quarries, furnaces, they visited. With them went one free-born citizen of Cobalt.

At a town called Calgary an hospitable rancher seized upon the pilgrims and bore them to his ranch, where, for their edification, he had caused a bronchobusting, steer-lassooing tourney to be held. Now the tourney proper was confined to a large enclosure, whose limits were marked by a high barbed wire fence.

After due busting of bronchos the steer-lassooing began—also the trouble. The guests, men venturesome and intrepid in shaft or drift or smelter, were looking now upon strange doings. The danger of the unknown brought them together, and they congregated near the entrance of the corral.

Without a warning, like an overdue creditor, a steer wide of horn and unspeakably fierce of mien, eluding cowboys and busters, sought to do some busting on his own account. Then horrid was the sight. Bulky Teuton, stolid Briton, austere Austrian, surly Scot, impaled himself upon that barbed fence. But the Man from Cobalt, captain of his soul, master of his emotions, shinned a seven-foot fence post and gazed serene upon the tumult below. Not long was he serene. That steer, blood in his eye, slaughter in his wicked heart, charged. Blinded with blackest passion, he hurtled into—not foreign dignitaries and international complications—but into and through the barbed wire.

Now the perch of the Man from Cobalt was precarious at best. Good living had increased his diameter, widened his cross-section. Thus it befell that the impact of that impetuous steer upon the fence loosened our hero's hold and shook him, not unlike an overripe plum, to the ground. And now behold him, recumbent, dazed, helpless, facing the horn-tossing beast! Did the Man from Cobalt blench? Did he quail? Did an ague of fear seize him? Not so! Calmly, intently, he fixed that animal with his luminous eye. Slowly, but surely, under the mesmeric power of that eye, the steer became less hostile, and at last, resuming his neglected cud, turned and went his way.

Such is the simple narrative of one great victory. We feel a spiritual glow, a lofty joy, in the knowledge that Cobalt produced the victor.

THE HON. MR. TEMPLEMAN.

There are considerations that override all questions of politics. On one of these we wish to touch.

The Hon. William Templeman was Canada's first Minister of Mines. The Department of Mines, created a little more than a year ago, has already, under Mr. Templeman's direction, accomplished much. But more has been planned.

The Minister of Mines, accompanied by the Acting-Director of the Geological Survey, R. W. Brock, has recently completed a tour of inspection of Ontario and British Columbia mining districts. We have reason to believe that similar tours through Quebec, New Brunswick and Nova Scotia were to have been undertaken. This is but an incident. But it reveals the fact that the Hon. Mr. Templeman is keenly interested in the mining industry and is anxious to see things for himself. Moreover, the Hon. Mr. Templeman has won and held the confidence not only of the officers of his department but of Canadian mining men.

As a result of the election, Mr. Templeman is now without a seat in Parliament. We hope most sincerely that this will not mean that he will no longer serve as Minister of Mines. We are sure that the Premier is sufficiently cognizant of the need there is of honest, competent and enthusiastic work in directing a department whose importance is growing day by day. The Hon. Mr. Templeman's work speaks for itself. A break in its continuity would be particularly disastrous. Any step that will insure the return of the Hon. Mr. Templeman to the position of Minister of Mines will be heartily welcomed by the Canadian Mining Journal,

and, if we are not mistaken, by all Canadians interested in the development of the mineral industry.

TAXATION OF MINERAL RESOURCES

Discussion of this vexed subject usually results in dithyrambs or expletives. We recall vividly certain delegations that waited upon a provincial minister of mines; and we remember thinking of the story of the Tower of Babel as it is recorded in Holy Writ.

We are glad to present in this number of the Canadian Mining Journal, a vigorous and suggestive paper on the taxation of mineral resources. Mr. Skelton is not unknown to the reading public. As the successor of Professor Adam Shortt in the chair of political ecenomy at Queen's University, Mr. Skelton occupies a position of more than academic importance.

Mr. Skelton's views are set forth with freshness and force. His subject is complicated and difficult. But he has wisely attempted to get down to bedrock, to make sure of whatever foundation there may be. In this respect he has rendered valuable service by clearing away incidental and accidental material that heretofore has blocked the view of those most interested in the subject.

It is beyond contradiction that Canadian mining men have either given the question of mine taxation too little consideration or have allowed purely local conditions to color their opinions too strongly. The matter is one that demands broad and careful treatment. Above all it is necessary that the recommendations made in the name of our representative society, the Canadian Mining Institute, be made not in the heat of debate, but only after lengthy deliberation.

We hope that Mr. Skelton's excellent paper will arouse renewed interest in a topic that should not be permitted to grow stale.

COAL DUST EXPLOSIONS.

The conclusions adduced by Messrs. James and John Ashworth in their paper on coal dust explosions are particularly important.

For some time watering was advocated as a panacea for all coal-dust ills. It was recognized, however, that where the mine temperatures were high, watering rendered work impossible. Next it was established that, in the presence of coal-dust, a damp atmosphere is more dangerous than a dry atmosphere.

Moreover, the best of flameless explosives may become the immediate cause of coal-dust explosions. The Messrs. Ashworth have ample ground for their dictum "that it is not possible to use any known explosive with absolute safety in a gaseous mine."

Here, however, the use of minimum quantities of explosion for each shot fired offsets the danger.

These, and many other considerations, point to the necessity of close and complete investigation of all the phenomena attending coal-dust explosions. And the most intelligent method of attacking the subject is, we think, that of beginning at coal-dust itself. That coal-dust must be considered as made up of particles enveloped and saturated with gases, is a much more logical position than that which defines coal dust as a aggregation of small solid particles.

We are in hearty accord with the object of the Messrs. Ashworth's paper. It is intended as an outline of the problem from a practical, working point of view. It presents the subject in a manner calculated to inspire interest and provoke discussion. And free discussion will most effectually dispose of the mischievous fallacies that have heretofore hindered investigators.

A writer in Queen's Quarterly makes unkindly comments upon Mr. T. A. Rickard's book, "A Guide to Technical Writing." The critic's objections are numerous. He states that the book will never serve as a text-book on "composition even among science students. . . . It deals too much with details." The Quarterly critic is at sea. "Composition," as it is learned from text-books and as it is taught in public schools, is a ghastly thing. Mr. Rickard's book is valuable because it is interesting from cover to cover, and because it deals with details.

THE TAXATION OF MINERAL RESOURCES IN CANADA

By O. D. Skelton, Queen's University.

(Read before the International Tax Conference, Toronto, October 8th, 1908.)

The taxation of mineral resources is, from the nature of its object, of less universal appeal than any other phases of the fiscal question. Everywhere men own houses and lands, mortgage property, and bequeath estates. But it is in only a minority of the commonwealths on this continent that the posession of rich mineral deposits affords the budgetmaker an opportunity and a problem.

On this side of the line at least there is general agreement that the opportunity should be improved, and the mineral wealth of the nation be made in some form or other to pay toll to the treasury. A plausible case has been made out for state ownership and operation, especially in the case of coal mines, but such a proposal involves a further advance toward paternalism than our American conditions and requirements warrant, at least as a general policy. A recognition of the inexpediency of public ownership does not, however, necessarily entail the adoption of the policy of granting mineral lands in fee simple on nominal terms. The considera-

tions which have made it seem advisable, throughout the greater part of the continent, to grant agricultural lands outright to the settler, practically without payment, do not bulk so important in the case of mineral lands. Granting leases for a fixed term of years in return for rental or royalty payments, is an intermediate policy which has much in its favor, and is, in fact, the policy prevailing in some of the most important Canadian fields. If again we reject this compromise as not sufficiently attractive to the prospector and the promoter, and hand over the mineral heritage of the commonwealth to individual exploitation, there certainly remains a good prima facie case for demanding a share through the ordinary channels of taxation. Granting that mining is a lottery in which the prizes rarely reach the price of the tickets, there seems no valid reason why the prize winners should not contribute their quota to meet the needs of government, subject, of course, to the same qualification as in other lines—that the tax should not be so excessive and indiscriminate as to deter investment nor the mode of collection vexatiously hampering. Nor is there much disagreement that mineral resources should be reserved for state rather than for local taxation. Whatever abstract basis of taxation we choose, whether domain-right or benefit or the good old Jack Sheppard basis of faculty, it is manifest that the wider unit has the greater claim. Decisive in the same direction is the consideration that if an adequate tax were imposed by a municipality it would often far exceed its legitimate needs, and if, on the other hand, the tax were cut to suit the municipality's normal expenditure, the industry would escape paying its fair toll. More contentious and of more practical importance are the questions how, and how much, to tax. With the purpose of setting forth Canada's contributions to these problems I shall review briefly the measures adopted in the sections where mineral taxation provides an important part of the revenue.

To begin with the province in which we are assembled—Ontario. As you are doubtless aware, the sources of provincial and local revenue are in the main quite distinct in Canada, unlike in the United States. Ontario derives its revenue chiefly from a Federal subsidy granted in lieu of the customs revenue surrendered at Confederation, from succession duties, corporation taxes and licenses, and from timber dues, and mining taxes, sales, and fees. The existing mining policy is of very recent origin, coincident, in fact, with the Cobalt boom. Twice in the history of the province the growing prosperity of the mining industry has led to the imposition of taxation, and twice repeal has followed on its decline. So recently as 1900 the late Provincial Government decided to grant mineral lands in fee simple, free from all reservations, and abolished the existing royalties, which varied from 2 to 3 per cent. In 1906, when the Mines Act was revised, the present Government confirmed this action, on its negative side, taking the ground that the impairment of title involved in the lease-royalty system deterred investment. But there was no intention on the part of either the Government or the people, dazzled by the new-found wealth of Cobalt, of foregoing such a promising source of revenue; it was only desired to change the form of sharing. The popular demand for action was the more insistent because it was through the building of a Government railroad that the silver field had been discovered, and largely by the aid of Government officials that it was developed. The further fact that the indirect benefits received were less than usual, owing to the cost of working, the Cobalt deposits being extremely low, and the ore being nearly all shipped out of the country for treatment, made the case overwhelming. It was largely, it is to be noted in passing, the Cobalt and Copper Cliff properties that apparently were in mind when the tax measures were framed, a fact not without significance for other less spectacular, struggling branches of Ontario's mining industry.

Action took several different lines. Most radical was the determination to reserve and develop for the province a promising tract, containing three and one-half square miles, in the Gillies limit, which had been withheld from prospecting on account of the timber operations on the surface. The provincial mine is being developed in the most scientific manner, and it is hoped that the only Government-owned and operated mine on the continent will prove a large source of revenue. Ontario has shared in the wave of public ownership sentiment, which has steadily been rising in America for the past few years, so that this step met with almost unanimous approval: public ownership has a romantic glamor when it is a silver mine which we, the people, control, lacking when the more proasic gas-works or street-car line is concerned.

In various other cases where veins were found on the right of way of the Government railway, or where claims were in litigation, special bargains were made on the basis of a cash bonus, together with a royalty of varying amounts. The bed of Cobalt Lake was sold for $1,085,000, of Kerr Lake for $178,500, and a royalty of 10 per cent.; the O'Brien and Crown Reserve pay a royalty of 25 per cent., while the Government railway, the Temiskaming and Northern Ontario, has made similar royalty agreements, usually on a 25 per cent. basis, with companies controlling the City of Cobalt, Cobalt Townsite, and Right of Way. These royalties, it is to be remembered, are not instances of a general scheme of taxation, but merely portions of the purchase price of claims sold under exceptional circumstances. Over and above the royalties paid, these mines are subject to the general tax about to be noticed.

Taxation proper forms the third source of mining revenue in Ontario. The basis laid down in the Act of 1907 is net profits. All mines which yield an annual profit above the exempted amount of $10,000 pay a flat rate of 3 per cent. on such excess. In ascertaining the profits, the gross receipts, or value at the pit mouth, is taken, and from this sum is deducted the cost of transportation of output sold, if borne by shipper, and actual working expenses, including mine wages and salaries, cost of fuel, of explosives, power, insurance, and sinking new shafts, and an allowance for depreciation of the plant—not of the mine. The tax levied in any year is based on the profits of the preceding year. Detailed statements are required for every operator, subject to check by the Mine Assessor, who is vested with wide powers of investigating both mine and books. Provision is made for appeal against the assessment of the Bureau of Mines to the Ontario Railway and Municipal Board, or to the Mining Commissioner, and if more than $1,000 is involved, a final appeal may be taken to the Ontario Court of Appeal.

Natural gas is taxed two cents per 1,000 feet, based on the company's books, or, if the Mine Assessor considers it advisable, on meter records. This, however, is virtually an export tax, as 90 per cent. of the tax is remitted if the gas is consumed in Canada, while gas used by municipalities is entirely exempt. Similarily in

the case of iron ore smelted in Canada, the profits tax is entirely remitted. In addition, an acreage tax of two cents per acre is imposed on all mining claims in unorganized portions of the province, above ten acres in extent, including mining rights held separately from surface rights. The final source of income consists of fees for prospectors' licenses, claim-staking, recording and transferring claims, etc. Mining companies, as well as individuals, are required to hold a miner's license, the fee varying with the amount of capital stock, but not exceeding $100.00 per million of capitalization.

It may be interesting to sum up the provincial revenue from mining sources in 1907; it comprised:—

Sales of mining lands		$1,184,719 06
Leases		21,563 16
Miners' licenses, recording fees, &c.		272,937 13
Royalties		207,945 06
Supplementary Revenue Act, 1907.		
Taxes on natural gas	$11,527 47	
Taxes on profits	26,922 00	
Acreage tax	5,003 88	
		$43,433 35
Assay Office (Belleville)		1,642 96
Total		$1,731,720 72

It should be noted that this was an exceptionally heavy year. The largest item, sales of mining lands, includes over a million dollars on the Kerr Lake and Cobalt accounts, and is not likely to be duplicated. On the other hand, the taxes under the Supplementary Revenue Act are based on the 1906 production, and will be much larger in succeeding years.

A word or two on the relations between provincial and local taxation. The Ontario Assessment Act provides that municipalities shall assess mineral lands, except oil lands, only at the value of other lands in the neighborhood for agricultural purposes; plant and equipment may be assessed at full value. Income derived from mining properties is, however, subject to municipal taxation in the same manner as other incomes. Contrariwise, in assessing the profits tax to be paid to the province, permission is given to deduct income tax paid municipalities, if not exceeding one-third, or in one specific instance, one-half, the total due.

The systems of taxation prevailing on the other districts must be summarized more briefly. Quebec and New Brunswick have rich mineral resources, but in neither case has development, especially of metallic minerals, proceeded far enough to warrant extensive taxation. Nova Scotia, however, possesses thriving coal and gypsum industries, a declining gold industry, and a subsidized iron industry. Mining taxation is an important source of its revenue, providing over 40 per cent. of the provincial income. Nova Scotia still adheres to its traditional policy of granting only leases of its mining lands, deriving a revenue chiefly from rentals and royalties. On gold a royalty of 2 per cent. of the gross value of the output is levied, collected from the stamp mills. The rental and royalty on gold amounted last year to about $13,000. Of much greater importance is the coal royalty, 10 cents a ton, excepting in the case of the Dominion Coal Company, which in 1893 obtained a 99-year lease of about 150 square miles on a 12-cent royalty basis. The royalty collected last year on a production of 5,700,000 tons was $563,000, or about 5 per cent. of the gross value of the output. Other license and rental fees brought the total to $633,000.

At the other side of the continent British Columbia contests with Ontario for primacy in mineral production, chiefly gold, silver, lead, copper and coal. The same policy prevails in granting lands in fee simple. The western province has not sought to swell its revenue by developing provincial mines or making million-dollar sales, but its system of taxation is comprehensive and well devised. A general tax is levied on minerals, other than coal, 2 per cent. of the gross, not the net, value of the output; ore-producing mines yielding less than $5,000 a year are granted a refund of half the tax, while the placer mines yielding lass than $2,000 are exempt entirely. On coal there is a tax of ten cents per ton, and fifteen cents on coke, if produced from untaxed coal. Until last year the rates were five and nine cents respectively. Unworked coal lands are taxed 2 per cent. on the assessed value, and an acreage tax of 25 cents per acre is imposed on unworked Crown-granted mineral claims. These taxes, together with the usual fees, brought in over $580,000 last year out of a total provincial revenue of $4,440,000.

The Federal Government also receives a share of mineral taxation. In the Provinces of Alberta and Saskatchewan, where the Dominion retains the Crown lands, a royalty of five cents per ton is collected on the coal, which, especially in Alberta, is being mined in rapidly growing quantities. The Yukon, which, as a territory, is still under Federal control, also yields a fair return to the Dominion. While its bonanza days are over and the production of gold has dwindled from $22,000,000 in 1900 to one-fourth of that sum last year, there is still good prospects of work on large scale, in dredging and quartz mining. The rate of taxation levied by the Dominion has decreased about as rapidly as the production. In 1897, to recoup itself for the heavy expenditure for road-building and policing caused by the Klondike rush, the Government imposed a tax of 10 per cent. on the gross value of the output up to $500, and above that 20 per cent. In the spring of 1898 the tax was made uniform at 10 per cent., with an exemption fixed at $2,500. As the levy was based largely on voluntary returns, it is no wonder that the high rate of taxation prevailing there was much evasion. In the year 1900, for example, the production was $22,375,000, according to the figures of the Bureau of Mines, based largely on reports of the Seattle and San Francisco assay offices. Yet the royalty collected for the fiscal year of 1899-1900 was only $730,000. If one-third the total output were conceded to fall under the $2,500 exemption, the royalty collected should have been fully twice as great. Accordingly, in April, 1901, the rate was halved and the exemption doubled, and finally in May, 1902, the present system was adopted. A tax of 2½ per cent. is now levied on all gold shipped out of the territory, the exemption, of course, being abolished. The practice is to sell the gold to one of the banks and trading companies at Dawson for drafts on other Canadian or American cities. The bank, which has deducted the amount of the tax from the purchase price, pays the export tax on shipping out the gold. Close inspection is made at the boundary to prevent smuggling out uncertificated gold. The new system has proved much more satisfactory in operation.

Some brief comments on the legislation reviewed may be in order. It will be noted that in practically all cases the tax is based on the value of the product rather than on the capital value of the mine. In the "Outline of a

Model System of State and Local Taxation," presented to the conference last year by the Vice-President of this Association, it was recommended that mineral taxation "should be imposed wherever possible, upon the capital value, excluding the value of the surface. If for any reason this is not practicable, the tax can be imposed in the form of a royalty." In Canada the order of preference is just the reverse. The negative reason for this is found in the fact that our constitution leaves more scope for legislative discretion than the American State constitutions. As our cabinet system of government makes it possible to fix responsibility more definitely, we feel free to grant power more freely, assured that all will be well, so long as, in Palmerston's phrase, there is someone to hang. This results sometimes in short cuts to justice, as, for example, in the Ontario Government's handling of various Cobalt disputes, which would send a shudder through the American trained in awe of rigid constitutions and courts committed to outworn economic shibboleths. In the field of taxation this freedom means that the Legislature is not forced either to conform to constitutional limitations in the vain striving after the uniformity of the general property tax, as in Minnesota, or to evade them by having recourse to license or franchise taxes, as advocated in West Virgiain.

The positive reason for preferring a tax on output is its greater certainty and definiteness. Any estimate of the value of minerals still in the ground, such as that just completed by the Minnesota Tax Commission, must, it is felt, contain a large element of guesswork, diligent and scientific guesswork it may be, but guesswork still. Greater exactness may be imparted to such ad valorem estimates by taking account, among other data, of the annual output, net or gross, and capitalizing this amount; but it is evident that this is so far merely an indirect return to the annual product basis.

The Canadian provinces have been less unanimous in deciding whether to tax on gross or on net annual production, as the outline given has shown. There are obvious objections to taxing net profits. From the point of view of the taxing authority, the first objection is that if in any year there chances to be no net profit, the mine or industry in question escapes taxation entirely, a privilege not open to the farmer whose crop has failed or the merchant whose trade has been dull. This is a real difficulty, but its importance is less in mining than in railroading, for example, since the mine is less likely to be operated than the railroad when expenses cease to be met. The second objection, from the same viewpoint, is the danger of the books being doctored to make the net returns appear as small as possible. This, again, is a very real difficulty. It can be met, however, by the adoption of a uniform system of accounting. If some such system as that which the British Institute of Mining and Metallurgy is endeavoring to draw up were made compulsory, the Mine Assessor's task would be lightened. From the point of view of the industry taxed, objection is raised against the inquisitorial powers conferred on the Mine Assessor, with all their possibilities of abuse. On this point some light may be thrown by the following quotation from a letter from one of the most prominent mining men of the province: "One can easily see how the net profits tax gives opportunity for any amount of graft and fraud on the part of the Assessor, an opportunity for first knowledge of the financial positon of the different properties, and of working the stock market to his advantage accordingly. As a matter of fact, however, owing solely to the high character and efficiency of the present Mine Assessor, who happens to be so fair-minded and honorable a gentleman that he has met with the approval of the great majority of the mining men, the enforcement of the machinery for collecting the tax, has not, I think, proved unbearable." If then, by a satisfactory solution of the personal equation, and the adoption of uniform accounting, the main objections to the net profits tax can be overcome, it seems on the whole preferable to the tax on gross value, because of its greater fairness in allowing for differences in expense of working, between one mine and another. The British Columbia mineral tax on net smelter returns, which does not make such allowance, obviously bears hard on low grade properties, while its coal tax is a more serious burden on Rocky Mountain than on tide water producers.

Much less deserving of consideration than the men engaged in actual development are the speculator who hold claims undeveloped for decades, and the syndicate which blankets large areas to prevent competition. The extent of this problem is evidenced by the fact that while, in 1906, 1,300,000 acres of mineral lands had been patented in Ontario, only a small fraction was being worked. Quebec's mining development has been hindered even more by similar conditions. The problem is one which would not arise in serious form if the policy of granting only leases of mining lands were followed, a policy which, as in the case of timber lands, though, of course, to a less degree, seems essential to the conservation of the future interests of the country. Though it is objected that the leasing policy discourages investment, it would appear that a 20 or 30-year lease on a fixed rental and royalty would be as attractive to the actual operators, if not to the promoters, as an outright grant subject to variations in the tax-rate every two or three years. If, however, the fee simple policy is adopted, taxation should be called in to remedy the inevitable evils. Ontario and British Columbia have grappled with the problem their generosity created, by imposing an acreage tax. As a result of the stricter execution of the Ontario law in 1906, over 300,000 acres were forfeited for failure to pay the tax of one cent per acre then imposed. It is the opinion of many mining men that the acreage tax should be very materialy increased. Perhaps the best plan would be to impose a graduated scale, the tax being made light for the first few years after acquisition, and bearing more and more heavily each year thereafter, till a maximum was reached, so that the holders would be compelled either to develop the property themselves or to make way for someone who would.

One remove further still from the man with the drill and concentrator is the promoter who never produces anything but beautifully engraved certificates. It is a frequent and natural cause of complaint of mine operators that while they are rewarded for developing the country's resources by heavy taxation, the shady promotor goes scot free. It does not, however, seem advisable to attempt to remedy the evils of fraudulent promotion by the slow-moving and indiscriminate machinery of taxation. Hope is to be found rather in strict enforcement of the provisions of the Companies' Act regarding prospectus publicity and directors' liability, and in journalistic vigilance.

A question of minor interest is raised by the exemption granted oil wells in Ontario's scheme of taxation.

In favor of exemption it is urged that by permitting municipalities to tax oil lands at their real, instead of at their agricultural, value, the gap is closed. But, aside from the fact that the municipalities do not, as a matter of fact, tax this increased value, the argument advanced runs counter to the general policy of separating provincial and local sources, which is one of the best features in the Ontario system. Nor does the plea that oil is a necessity in every home and therefore merits exemption, carry conviction on this continent dedicated to protective duties on the chief necessities of life. Perhaps the omission may be justified on the principle *De minimis non curat lex,* as the total production for 1907 was less than 800,000 barrels, worth about $1,500,000 (natural gas reached about $750,000 in value), and the grade is so inferior that the Dominion Government considers it necessary to give a bonus of 52½c. per barrel to enable the industry to compete with the American product. Possibly if a provincial tax were imposed the Dominion authorities might be obliging enough to increase the bonus correspondingly.

Though somewhat of a digression from the subject of the paper, it may be worth noting here, as the reverse side of the picture just presented, of abundant inflow of revenue, the amount expended on bonusing mineral production. The total revenue received in Canada from mining sources in 1905-06 was slightly under $2,000,000. In approximately the same fiscal year the Dominion Government paid out in bounties to encourage the production of lead, petroleum and pig iron, and the manufacture of steel and steel products, over $2,380,000. Various minor provincial subsidies and exemptions, not to mention very low rates granted certain steel companies, on the Government railroad, the Intercolonial, brought the amount well over $2,500,00. It is not to the point here to consider how far these subsidies have served their purpose or how far they have simply given company promoters more excuse for watering stock, but you can see from this brief reference how fond we are in Canada of taxing Peter to bonus Paul.

THE MINING OPERATIONS OF THE DOMINION COAL COMPANY.

F. W. GRAY.

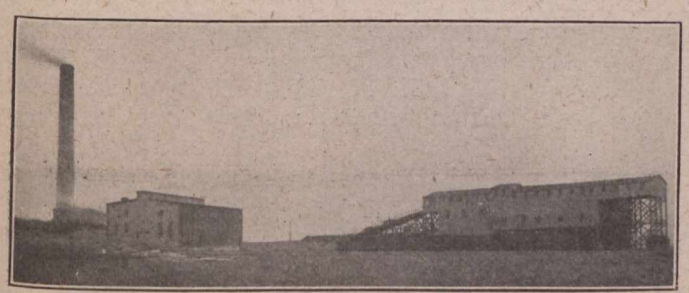
(Continued from issue of August 15.)

Dominion No. 6 Colliery.

No. 6 Colliery is the most recent of the six Phalen seam mines of the Dominion Coal Company. It is a slope mine placed at the eastern extremity of the Glace Bay Basin, and its territory is mostly submarine.

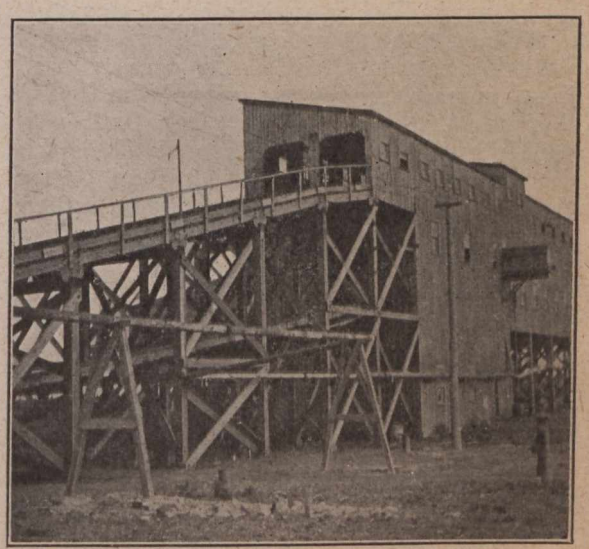
The crop was opened in the spring of 1904, and the mine began to be a regular producer about one year later. At the present time the output is 25,000 tons per month, which will be raised to 30,000 in 1909, at which time the new permanent haulage now in course of construction will be completed.

No. 6 Colliery came into a good deal of prominence at the time of the Steel-Coal trial before Judge Longley



No. 6 Colliery Bankhead and Compressor House.

in Sydney. One of the most surprising features of this trial was the extraordinary assertion of the Steel Company's counsel that the workings of No. 6 Colliery were not on the Phalen seam. For several days in succession the court at Sydney was treated to learned disquisitions on paleontology and goelogical horizons, illustrated by a large wooden model of the Glace Bay coalfield. To those who had any knowledge of the actual facts the evidence given on this matter was a delicious admixture of opera bouffe and burlesque, to which the innocent seriousness of the performers gave additional piquancy. To disprove the Steel Company's contention the Coal Company were put to the expense of sinking boreholes all along the shore line from Caledonia Colliery to No. 6 Colliery. The explorations resulted in a complete and absolute corroboration of the plans and sections of the Geological Survey of 1872-1874, establishing the fact that the workings of No. 6 Colliery are on the continuation of the Phalen seam. This should never have been questioned. Only the audacity of ignorance could excuse a contention so



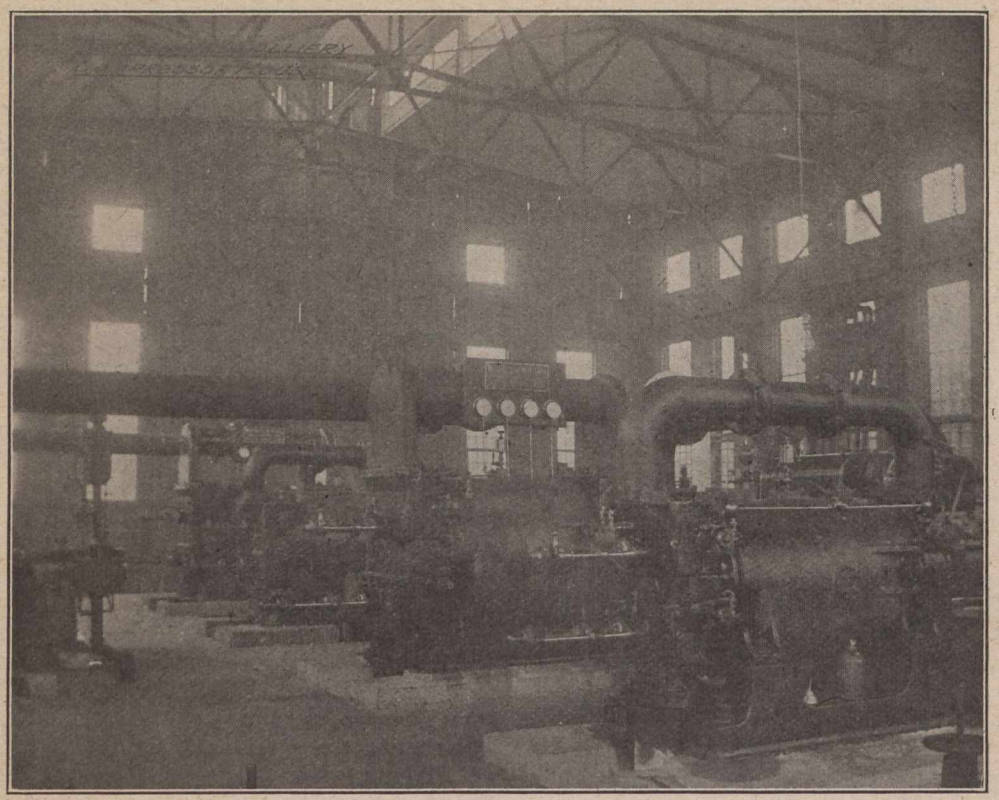
No 6 Bankhead—Trestle Approach Carrying Car Hauls.

manifestly "frivolous and vexatious," and for ignorance, in view of the work of the Geological Survey, there was neither necessity nor palliation. This is very plainly shown by the remarks of Mr. Hugh Fletcher in his "Summary Report for 1907 on Explorations in Nova Scotia." Mr. Fletcher writes: "A few days spent in examining pits and boreholes between Glace

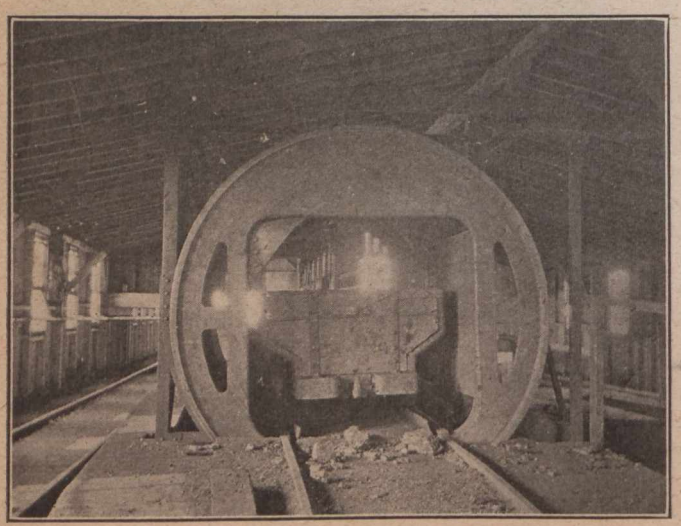
Bay and Schooner Pond convinced the writer that no mistake had been made in locating No. 6 as a colliery to supply the demand for Phalen seam coal, that the seam worked at No. 6 could be none other than the coal of the Clyde Mines and of McDonald Cove, called the Phalen; that the Emery seam is everywhere at its proper distance beneath it, and that, therefore, No. 6 cannot be on the Emery seam as had been suggested." After reviewing the evidence he had gathered in support of this statement Mr. Fletcher goes on to say that "it is not surprising that the writer should advise the Dominion Coal Company to desist from further explorations. My conclusions, which agreed with those communicated to the Dominion Iron & Steel Company in January, after consideration of all the official evidence on the subject, were again presented to the Dominion Coal Company." It will be remembered that the date of the Steel-Coal trial was August, 1907. In view of the fact that Mr. Fletcher's studied conclusions were placed before the officers of the Steel Company in January of the same year, comment is surely superfluous.

The surface buildings of the colliery and its equipment generally are of the most modern and substantial character, and provision has been made throughout for additions to the plant as the requirements of the colliery grow.

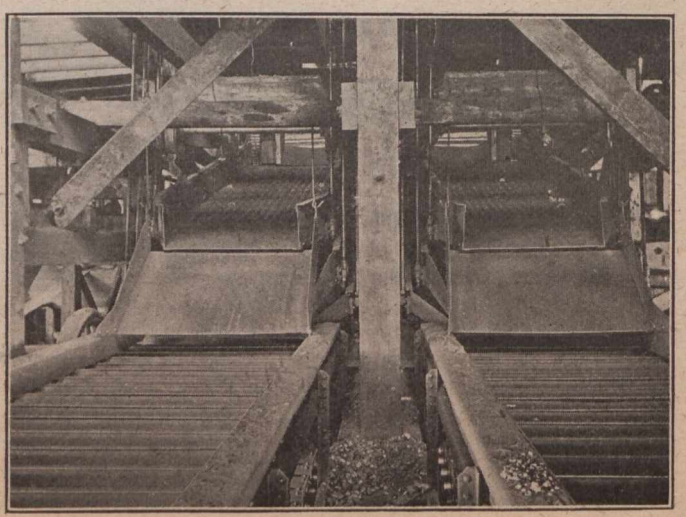
The power plant at the present time consists of six Babcock & Wilcox boilers, rated at 1,500 hp., fitted with Parsons forced draft. The smokestack was built by the Alphonse Custodis Company of New York. It is 150 feet high, built of radial brick, on a common brick base. The boiler-house is of steel and brick con-



No. 6 Colliery—Interior of Compressor House.



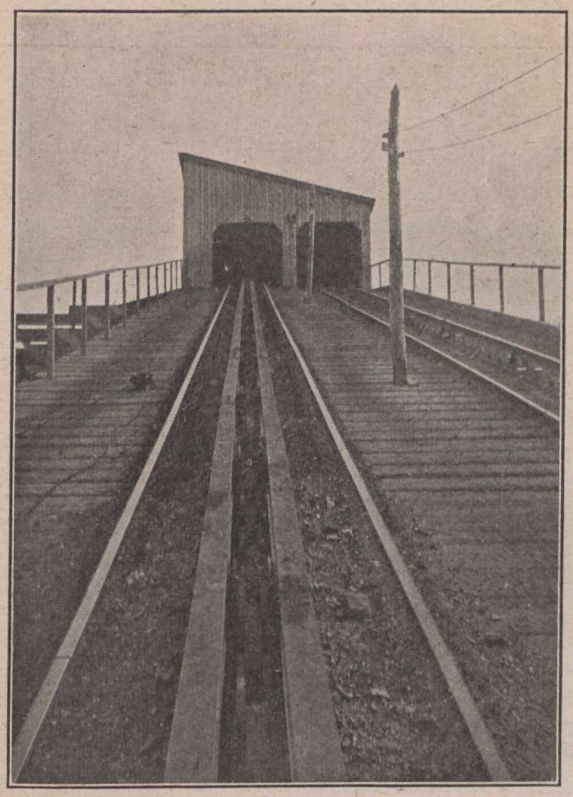
No. 6 Bankhead—Rotary Tipple.



No. 6 Bankhead—Picking Belts—(Shows Shaking Screens).

struction, temporarily boarded up at one end to permit of a future extension of the boiler plant. An annex to the boiler-house contains the feed water heaters and feed pumps.

The compressor-house is a fine building, also of steel frame and brick construction. It is 90 feet



NO. 6 BANKHEAD- UP AND DOWN CAR HAULS.

long, 63 feet wide and 30 feet high. It has massive concrete foundations, and is exceptionally well lighted and ventilated. It contains two Walker air compressors, 24x41 steam cylinders, 23½x38 air cylinders, and 48-inch stroke, having a total capacity of 7,000 cubic feet of air per minute. They are complete with circulation pump and after-coolers. They are fitted with an automatic lubricating system.

The bankhead is of modern design and almost entirely automatic. The structure is of wood, hard pine posts, spruce and hemlock framing on concrete pedestals, electrically lit, and fitted throughout with standpipes and hose for fire protection.

The coal cars are handled by automatic up and down car hauls, a revolving tipple, and an automatic "kick-back." The coal passes from the tipple on to a triple battery of shaking screens, from which it is fed to the picking belts, two in number. These belts are 43½ feet long, 6 feet wide, speeded to 43 feet per minute, and, as will be seen from the snapshots accompanying, they are exceptionally well lighted. The unusual width of the belts, the slowness of their motion and their general design are such that coal can be cleaned to the best advantage with the minimum of breakage. The nut and slack coal is dealt with by transverse swinging conveyors. It may be safely said that No. 6 has the most efficient screening plant in Cape Breton.

Up to the present time the haulage has been effected by a temporary hoist, which is being replaced by a 26x48-inch Corliss valve engine, built by the Jenckes Company. This engine will be large enough to overtake the haulage demands of the colliery for a long time to come. The foundations contain over 300 cubic yards of concrete. The engine-house will be of wooden construction, with a brick fire wall on the side next the pit.

Until quite recently the mine has been ventilated by a small temporary fan. This has been replaced by a Walker "Indestructible" fan, 20x7 feet, having a rated capacity of 300,000 cubic feet of air at 3-inch W.G. It is driven by a 16x16-inch Robb horizontal engine.

The fan itself is steel cased on concrete foundations, and the fan race is also constructed of concrete. The fan engine-house is of entirely fireproof construction, built of brick, lighted by metallic fire-proof windows, and roofed with corrugated asbestos sheating.

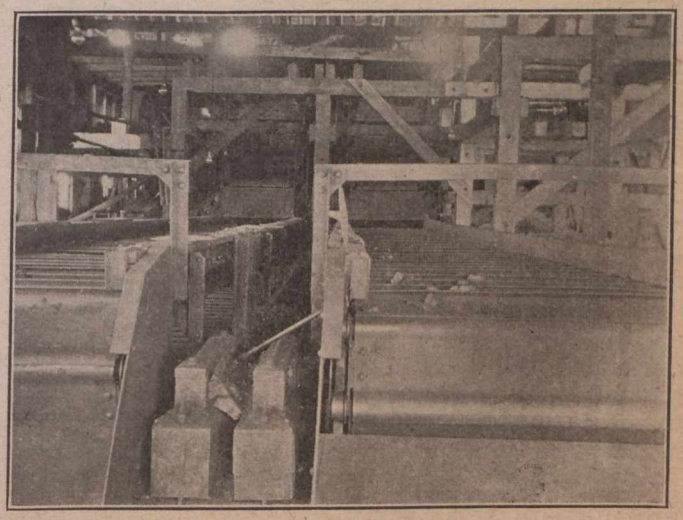
Other surface buildings are the machine shop, blacksmith shop, colliery warehouse, office, lamproom, washhouse, stables, firemen's hall, emergency hospital, etc.

The machine shop is fitted with a 23"x16' Porter lathe, steam hammer, pipe threader, and various machine tools. The equipment is very complete, as No. 6 is a considerable distance from the main shops at Glace Bay.

For fire protection purposes a 500-gallon Knowles pump is provided, and a sufficient equipment of fire-fighting appliances. The mine has its own fire brigade. It has also two corps of men trained to use the Draeger apparatus, four of which are kept at the colliery.

Safety lamps are exclusively used, all of the Ackroyd & Best type.

The mouths of both slopes are protected by reinforced concrete arches. The pitch of the Phalen seam at No. 6 is a little greater than the average of this seam in the other collieries, being around 12 per cent. The main deeps are down 4,000 feet, and are extended 200 feet beyond the shore line. The cover at the shore is 375 feet, and two levels are now being driven in submarine territory. On the west side of the mine the levels are rapidly approaching the workings of the Old



NO. 6 BANKHEAD—PICKING BELTS (BEGINNING OF LOADING APRONS SHOWN).

Clyde Mine, which was worked years ago, and lies about midway between the workings of No. 6 and No. 4 (Caledonia). The Phalen coal from the Old Clyde Mine bore an excellent reputation for quality.

No. 6 is connected by a branch line 5½ miles long

with the main line of the Sydney & Louisburg Railway, which runs a passenger train twice weekly between Glace Bay and No. 6 for the convenience of the residents. The village consists of about 130 houses owned by the company. They are situated near the shore, and command a good view of the opposite coast and the mines of Glace Bay.

The next article of this series will deal with No. 2 Colliery, and this will complete the description of the Phalen seam mines in the Glace Bay Basin.

THE PRESENT POSITION OF THE COAL DUST PROBLEM.

By Messrs. James and John Ashworth, Mining Engineers.

(Paper read before the Victoria Meeting of the Canadian Mining Institute.)

The subject of coal-dust is still one of the most important questions which can be discussed by any meeting of mining engineers, and it, therefore, deserves very careful and detailed treatment, but for the purpose of the present meeting and for the useful advancement of information on this particular subject, the authors have condensed their matter so as to provide ample scope for the discussion of possibly every phase of coal-dust theories.

At the outset it may be of advantage to state what we mean by "Coal-Dust," as connected with colliery explosions—generally speaking, therefore, when they refer to coal-dust they will have in mind the very fine dust which is ordinarily present in coal mines and continuously produced from the coal in course of transit from the working face to the pit shaft by friction and that such dust is more dangerous than the older dust which has settled on the sides, roof and timbering of the mine.

We submit the opinion that this dust is the most dangerous factor in all collieries, particularly where firedamp is produced, and think that the many disasters which have occurred in Canada and the United States of America, are sufficient in themselves to take as examples, to convince every careful observer and student of coal-dust phenomena, that terrible disasters such as Monongah and Darr were mainly due to the part played by floating coal-dust, and that the incomplete combustion of this dust, coupled with the heat due to the pressure developed, acting on the older dust, created the huge volume of carbon-monoxide gas which is the actual life destroying element of every collinery explosion. To make our views on the universal production of carbon-monoxide gas more clear, we have to express the opinion that the enormous and sudden pressure created underground by explosions of mixtures of firedamp and air, or of firedamp and coal-dust, or of air and coal-dust, is sufficient by itself to produce huge volumes of carbon-monoxide gas without the addition of actual flame, and in support of this contention quote the latest estimates of these pressures made by Mr. J. T. Beard, of the International Correspondence Schools, Scranton, Pa., and of Prof. H. M. Payne, of West Virginia University, U.S.A. The former in his recently issued text-book, entitled "Mine Gases and Explosions," estimates the possible pressure at 196 lbs. per square inch, and the latter at from 50 to 146 lbs. per square inch. (Mines and Minerals, February, 1908), and the difference in these estimates arises from the volume of air available, and particularly so in Prof. Payne's estimate, which was based on what he considered did actually occur at Monongah.

The sudden and instantaneous effect of these great pressures on the miners, is to produce loss of consciousness or in some cases death by concussion of the brain, and thus men are found in the precise positions they occupied at the moment of the explosion, or when less severe pressure is produced they are overtaken by the afterdamp before they recover consciousness and are thus poisoned and killed in a few seconds.

Authorities are divided as to whether a small quantity of dust or a dense cloud is the more dangerous, but the author's experience and observation leads them to the conclusion that in the majority of instances it is the dust floating in the air which is dangerous, and, therefore, if more than this comparatively small quantity is present there is then an insufficient volume of air to complete the combustion, and the flame is smothered out. Experience and observation also lead them to conclude that dust is more dangerous in a damp atmosphere than in a dry one, and that there are numerous cases on record where a mine has been described as dry and dusty whereas the air was either saturated with moisture or so nearly saturated that no more than one grain of water vapour per cubic foot would have completed the saturation.

Writers and experts on coal-dust phenomena are generally in accord in treating coal-dust as a very small solid, but the authors of this paper think that it ought not to be treated as solid but as a concretion of gases, because Prof. Bedsch, D.Sc., of the Armstrong College, Newcastle-on-Tyne, has proved by experiments, extending over many years, that every particle of coal-dust freshly produced from the coal face, contains both firedamp and other gases of the paraffin series under pressure, and that these are continuously giving off until the supply is exhausted, and that they are then replaced by oxygen from the atmosphere and not by air, as the atoms of nitrogen are too large to pass through the pores, and are, therefore, filtered out. Consequently it will be readily understood that freshly produced coal-dust being surrounded by the gases escaping from the store occluded in its own small body, floats, as it were, in its own balloon of gas, and is, therefore, immune from any dampness in the air current or, in fact, from any form of water. In many instances the expert evidence given to ascertain the initiatory cause of an explosion is evenly divided between coal-dust only or firedamp only, being the agency by which the original cause, generally a flame from a shot, was extended some distance into or throughout a colliery, and the authors submit that no enquiry of this class can in any case be complete, unless the dust has been examined by what they may term the "Bedson process," and that such an in-

vestigation would be still more complete if the structure of the dust were examined under the microscope, as was done by Mr. W. E. Garforth after the explosion at Altofts, in England, several years ago (see the report of the Royal Commission on Explosions from Coal-Dust). Taking these two sets of experiments (both due to private initiative and not to the application of public funds) into plain matter of fact consideration the authors conceive that it has been proved by Mr. Garforth without the possibility of dissent that coal-dust is not a solid but is possessed of pores, and by Prof. Bedson that gases exist in these pores under considerable pressure, and, therefore, that every particle of freshly-produced coal-dust ought to be practically considered as a "gas" and not as a solid. As a gas bag surrounded by air it is in its most favorable condition and position to inflame, and explode, and thus to initiate or extend the effect of any flame which is of sufficient intensity to ignite it.

This course of argument and practical demonstration naturally leads up to another of their conclusions on the use of explosives, viz., that it is not possible to use any known explosive with absolute safety in a gaseous mine.

There is, however, another danger which is probably never taken into account, viz., that due to detonation. Every high or so-called flameless explosive requires the application of a detonator, and if the detonator is not sufficiently strong, ignition and not detonation is the result. But assuming that the detonation is complete and that it is an over-weighed shot, we have then to contend with results, which are, in some senses, more dangerous than a blown out powder shot, because we have created a huge detonating vibration which is unaffected by any amount of watering, and which may be communicated to the most distant corners of a mine without demonstrating any effects en route. Supposing, therefore, that either large or small accumulations of firedamp mixed with air exist in any part of a mine, these may be simultaneously exploded by this detonating effect. The Wattstown explosion in South Wales was probably an instance of this effect.

The question which naturally seems to follow this line of thought is, "What percentage of firedamp is permissible in a mine or place where explosives are used?" and this is not so easily answered, because experiments have already demonstrated that less than one per cent. may be dangerous. If, then, one per cent. of firedamp will make a mine dangerous, it would appear rather absurd to blast excepting in such cases where it is absolutely necessary, and then only under the most stringent precautions, but the absurdity of the position is increased when we find that the usual tests for firedamp are made with safety lamps which are incapable of discovering less than two per cent., and on this showing the mine is certified as clear from gas and safe for shots to be fired. The only possible safeguard which the authors have to suggest to add to the safety of gaseous mines when explosives are used, is to limit the weight of the explosive in each shot—that is to say, a large number of small shots might be safe where the same weight of explosive in one shot might cause a disaster—for the valuable discovery, "the charge limit," the writers believe we are mainly indebted to French engineers. The conclusion of the writers is that not more than one per cent. of firedamp is permissible, and that the weight of explosive per shot hole should be limited.

As to whether it is possible to render a coal mine safe against the initiation or extension of an explosion by any application of water, the writers are of opinion that it is positively impossible to restrain the extension of an explosion by any known means of applying water, and, further, that any form of water to dampen the air assists in the extension of an explosion, because as proved by Prof. H. B. Dixon the maximum explosive effect of mixtures of gas and air is only obtained when the atmosphere contains five per cent. of water vapour, and as this percentage can only be attained by the use of steam it is, therefore, an impossible application, and the writers say positively that there is no known means of applying water so as to control the extension of an explosion.

The difficulty of applying water does not, however, end here, because the weight of water which will saturate an air current may vary from, say, 4 to 13 grains per cubic foot, and, therefore, either 4 or 13 grains ought to be equally effective in controlling the extension of an explosion, but this propostion is absurd when we have already proved that five per cent. of the weight of the air and gas mixture is required to give the maximum explosive effect—that is to say, not less than 25 grains per cubic foot of the mixture.

Possibly resulting from the escape of the occluded gases from the coal-dust, it has been found to be extremely difficult to dampen fresh coal-dust, and a practical demonstration of this fact was given to the jurymen at the Monongah inquest by putting about a pound of fine dust into a basin of water, and after stirring it up, and pouring off the water, blowing into the dust when it immediately flew about the court room like soot.

The possibility of rendering a deep, dry and dusty mine proof against the extension of an explosion by water saturation has, however, another barrier against its adoption, and investigation has demonstrated in the mast positive manner possible, that if miners are to work in such mines with any degree of comfort or efficiency the air must be kept as dry as possible, so that the perspiration from their bodies can pass into the air and afford a sense of coolness, for if it does not, then the body temperature rises until what is now described as "heat apoplexy" results, with loss of muscular power, and the man dies. In many deep mines the heat ranges from 75 to 90 degrees Fahr, and, therefore, if the air were saturated with water (9.4 to 14.8 grains) the miners could not possibly work. About 8 grains of water vapour per cubic foot of air should be the maximum dampness permissible in the air of a deep mine.

Another phase of the coal dust problem still remains to be considered, viz., the explosion of dust in mines where firedamp has never been discovered, such as Camerton and Timsbury, in the Somersetshire Coalfield, in England, and so far no experiments have been made to ascertain if any or what gases are occluded in such coal-dust, and as these explosions have originated in old roads, it is possible that the dust had become altered by exposure to the air current, and having absorbed oxygen had become more susceptible to the influence of flame. Only by submitting such dusts to courses of experimental research similar to those already referred to can its ignition or explosion, when exposed to a flame of great intensity, be satisfactorily explained.

The possible speed of a coal-dust explosion has frequently been debated, but without reliable data on which to base an opinion, until the Monongah disaster, when the difference of time between the explosion reaching the surface outside of No. 8 and No. 6 mines

respectively, was observed to be five seconds, and one of the writers has calculated that this would give a speed of 3,000 feet per second. This fact is particularly interesting because it quite upsets those theories which require a considerable time to produce a series of explosions which are not instanteous, and do not take into account the effect of cooling or condensation.

The writers trust that these few notes on a subject which has such a wide range of interest may be sufficient to provoke very considerable discussion and result in the gathering together of much very valuable information, and also produce suggestions for some better and more effective means of exorcising the demon of coal-dust than the present-day ineffective systems of watering.

Note.—Messrs. J. B. and W. N. Atkinson, E. Bainbridge, W. E. Garforth and W. Galloway made an estimate of the velocity of the explosion at Altofts, based on the movement of materials, and this was placed at 99 to 100 miles.—Coal-Dust Report, Q. 3821.

If per minute this would be 7920-8799 feet per second, or more than the speed at Monogah, but if per hour this would only be 132-147 feet per second.

FROM OCEAN TO OCEAN—CANADIAN MINING INSTITUTE EXCURSION.

(By an Occasional Contributor.)

The excursion of the Institute for 1908 covered a larger mineral field than has ever before been visited, on a single excursion, by any party of men. The party gathered at Quebec City on August 24th, and proceeded to Sydney, Cape Breton; thence they gradually worked eastward, visiting the chief and more accessible mining camps in the various provinces, the last mines visited being those of Nanaimo, Vancouver Island, B.C.

There was a two-fold object in organizing this excursion. The Council of the Institute felt that it would be well for its representatives to visit various parts of the Dominion in order to become acquainted with local conditions, and to meet the men of the different camps at home. This part of the work of the excursion was successfully accomplished. The excursionists were splendidly received in the various centres, and they had the opportunity not only of becoming acquainted with the majority of the leading mining men of the Dominion, but they also met many of the chief public men of the various provinces. The excursion has thus made the Institute much better known, and it is felt that the work of the Institute will henceforth be more widely appreciated.

The second object of the excursion was to show the mineral resources of Canada to a number of guests from Great Britain and abroad. Among the societies that sent representatives on the excursion was the Institute of Mining and Metallurgy, London, which sent one of its past presidents, together with its secretary and two members of the Council. Then the British Iron and Steel Institute, the Institution of Mining Engineers, the Mining Institute of Scotland, the South Wales Institute of Engineers, and the Manchester Geological and Mining Society were also represented by well-known members. Among the foreign representatives were the chief geologist of the Prussian Geological Survey, a representative of "Stahl und Eisen," one of the Counselors of Mines of the German Government, and others. The United States was represented by a metallurgist from Columbia University and the Professor of Economic Geology of Cornell University. It may also be added that the party was fortunate in being accompanied by the Geographer of the Dominion and by the Dean of Forestry of the University of Toronto, and by other men who were important factors in making the excursion a success. It is doubtful if another party could be got together that possessed so many elements for success. We even had our own piper. The conductor of the sleepers pleased the Scotchmen of the party and others greatly by his playing. He led us to the nightly frays and brought us home after the slaughter!

The visit of the British and foreign guests of the Institute cannot fail to have an important bearing on the future of the mining industry in Canada. These men will each serve as a centre of information. It will thus be more difficult to misrepresent the industry abroad either by overpraising it on the one hand or decrying it on the other.

Everything contributed to make the excursion a success. As already said, the personnel of the party was right—it possessed the right elements. The presence of the guests of the party pleased the mining men at the various places visited, and made the excursion a greater success than if the party had been composed of Canadians only. During the six weeks of the trip the weather could not have been better. The arrangements of the party were not interfered with by rain at any point from ocean to ocean.

Too much credit cannot be given the railways for what they did to make the excursion a success. During the greater part of the eastern trip the Intercolonial was used, and its service was perfect. From Montreal west by far the greater part of the travelling was done over the Canadian Pacific, and satisfaction was expressed by members of the party for the service that this great railway afforded.

Quebec City.

The party gathered at Quebec on August 24th. They were given a kindly reception and a pleasant send-off at an informal meeting in the Chateau Frontenac by Sir Lomer Gouin, the Premier of the Province; Sir George Garneau, the Mayor of the city, and by the Hon. Mr. Devlin, Minister of Mines. While in the city the party were shown the now historic bridge and other points of interest which attract visitors from all parts of the world to the old city.

Sydney.

The arrangements in Nova Scotia for the entertainment of the members of the Institute and their guests were in charge of the Mining Society of Nova Scotia,

which had gathered in force at Sydney. The evening before our arrival members of the Nova Scotia Society, accompanied by Lieutenant-Governor Fraser, Premier Murray and Minister of Mines Chisholm, had come to Sydney. These gentlemen spent three days with us, and accompanied us on our visits to the Dominion Coal Company, to the Dominion Iron and Steel Company and to the mines and plant of the Nova Scotia Steel Company. Mr. Charles Fergie, the past president of the Institute, and other local men, had looked after the arrangements thoroughly, and the visiting members of the Institute were much pleased with what had been done in their behalf. At each plant visited a good opportunity was afforded of gaining a knowledge of the operations, and the excursionists were much impressed with the size of the coal field and by the scale on which the iron and steel industry is being carried on in Cape Breton.

Various entertainments were provided at Sydney. Luncheon was furnished to the party on each day of the stay by the three companies whose plants we visited. On one of the evenings a smoker was given, and one night was spent in a banquet at the hotel. It is not necessary to say more than that the banquet, smoker and luncheons passed off with the great success usual to such mining functions when held in Nova Scotia. After leaving the plant of the Nova Scotia Steel Company at North Sydney on the last day of the stay the party were the guests of Mr. James Ross on his yacht "Sheila," from North Sydney to Sydney, landing at the residence of Mr. J. K. L. Ross, where a garden party, of which the hosts were Mr. and Mrs. Ross, was attended by the excursionists and by representative people of Sydney. It is thus seen that there was considerable variety of entertainments at Sydney. They all tended to make our visit to Cape Breton a very pleasant one.

Quebec Province.

Leaving Sydney, the party proceeded directly to Levis, arriving early on Sunday morning. The day was spent by many of the party at the Chateau Frontenac. In the evening the Quebec Central train was taken for Thetford Mines, where the party was met by Mr. George R. Smith, past president of the Institute. We were shown over the mines and mill, which are under Mr. Smith's management, and also visited some of the adjoining properties. Leaving Thetford, the party proceeded a few miles to Black Lake, where they were met by Mr. Hopper, a member of the Council of the Institute, and by other representative mining men of the district. Several of the mines and plants in the vicinity of Black Lake were visited. Probably no mineral

C. M. I. EXCURSION AT FERNIE, B.C.

Building is office of Crow's Nest Pass Coal Company, one of the very few structures that escaped destruction by fire.

industry visited by the excursionists impressed them more than did that of the asbestos mines of Thetford and Black Lake. Few of the members of the party previously realized that the industry had reached such great dimensions and that it was still growing so rapidly.

Leaving Black Lake, the party proceeded to Colraine, where they visited the unique and interesting chrome iron ore deposits. Thence they proceeded to Sherbrooke, where they arrived in the evening, and left by an early morning train for Montreal.

On this trip through the asbestos and chrome district of Quebec the party was accompanied by the Hon. Charles Devlin, Minister of Mines of Quebec Province, who did much to add to the pleasure of the trip.

Montreal.

In the evening of the day of arrival in Montreal a banquet was tendered the excursionists by the Montreal branch of the Institute. The Montreal members are to be congratulated on the success of this banquet. The speeches of Hon. Mr. Devlin and others who were on the toast list were of an important character. Mr. Devlin assured the members of the Institute that he had been so impressed with the character of the work which the Institute was doing that he would recommend to the Quebec Legislature that an annual grant be given to the Institute. Moreover, he had decided to send his Superintendent of Mines through with the party to British Columbia in order that Quebec Province might benefit from advice tendered by members of the party concerning the development of mineral resources.

The following day was also spent in Montreal, the visitors being shown around the city by the local members, and being entertained at luncheon at the Hunt Club.

Toronto and Niagara.

On the morning of September 3rd the excursionists arrived in Toronto and took the boat soon after their arrival for Niagara Falls. Mr. P. W. Ellis, one of the commissioners of the Niagara Falls Park, had kindly made arrangements for the entertainment of the party on this side trip. The party had not only the opportunity of viewing the Falls and river scenery, but they were shown through some of the large power plants, and were well entertained through the care which Mr. Ellis had taken in making arrangements for the visit. A number of the local members of the Institute accompanied the party on this visit to Niagara, and assisted in entertaining them during the trip. On the morning of the 4th the party arrived in Toronto. During the day they were the guests of the Exhibition Directors, and had the opportunity of viewing the exhibits of minerals from the various provinces which were shown at this year's Fair. The reception by the Exhibition Directors took on the form of a Government reception, as the acting Premier, Hon. Mr. Foy; the Minister of Mines, Hon. Mr. Cochrane, and the Provincial Treasurer, Hon. Col. Matheson, were present and met the mining men.

Cobalt.

On the evening of the 4th the party left Toronto by special train over the Grand Trunk Railway for Cobalt. They were met at Temagami by Mr. Cole, chairman of the Cobalt branch of the Institute, and by Mr. Black, superintendent of the Temiskaming and Northern Ontario Railway. While at Cobalt and vicinity the party was in charge of Mr. Cole and members of the local branch, Mr. Black looking after the railway arrangements. The arrangements for the entertainment of the guests at Cobalt were perfect. Arriving at the station, Mr. Cole and the committee divided the party into several groups and arranged for their visits to various mines. It was somewhat unfortunate, however, that the party did not have more time in this camp. On the evening of the 5th, owing to smoke on Lake Temiskaming, it was found impossible to take the boat trip which had been planned from New Liskeard. During the evening the members of the party were met at Haileybury station by the founder of the town, Mr. C. C. Farr, and were escorted to the club, where Colonel Hay and other mining men had arranged a pleasant smoker.

Needless to say, the visitors were impressed with what they saw at Cobalt, and with their reception there. The souvenir pins presented by the local committee and the rich specimens of ore so freely given by the mines will keep the camp green in their memories. Cobalt can always be depended on to do the right thing, and always keeps open house.

Temagami.

On Sunday morning, the 6th, the party left Haileybury for Temagami, the Cobalt local committee having arranged for an excursion up the lake. Luncheon was served at the Temagami Inn, and the party returned to the train at Temagami station in the evening.

Moose Mountain.

On the morning of the 7th the party left Sudbury, accompanied by Mr. Hawkes, of the Canadian Northern Railway, and Mr. Leach, superintendent of Moose Mountain mine, for a visit to that property. A number of the citizens of Sudbury accompanied the party, and a very pleasant day was spent on the new railway line between Sudbury and Moose Mountain. This was the only working iron mine which the party had an opportunity of visiting during the trip. The visit was of interest to the excursionists owing to the fact that the deposit is somewhat characteristic of those which are of such great importance in the Lake Superior region.

Copper Cliff.

On the morning of the 8th the party were taken in charge by the Canadian Copper Company. Mr. Turner, president of the company, had made arrangements for the party to visit the splendid new smelter at Copper Cliff and the Krean Hill mine. The gentlemen associated with Mr. Turner were the mine manager of the company, Captain Lawson, and the metallurgist, Mr. Browne. The visit to the smelter, owing to its being so recently constructed and so up-to-date in all its parts, was especially interesting to the metallurgists of the party. Mr. Browne was congratulated on the plant which is directly under his charge. The Crean Hill mine also proved very interesting. Luncheon was given the party at Crean Hill by the company, and proved a pleasant function. It was what may be called the only camp dinner which the party had during the trip, and to many of them it was unique. The Hon. Frank Cochrane, Minister of Mines, who accompanied the party from Toronto to Cobalt and Sudbury, acted as toastmaster at the luncheon, and some highly complimentary things were said of Mr. Turner, his staff and the company which he represents. On returning in the evening from Crean Hill a visit was made to the Victoria Mines smelter, where the party was met by Mr. Corless and his staff. This smelter was of special interest to some of the English visitors owing to their

being acquainted with Mr. Mond and to their having followed the successful career of the Mond Nickel Company. On the return to Sudbury in the evening an informal gathering was held by a few of the excursionists in the King Edward Hotel, where two or three of the guests who had to return east from Sudbury were given a send-off. At Sudbury the party were joined by two or three gentlemen from abroad who had not been able to reach Canada earlier. Leaving Sudbury at midnight, the trip to Winnipeg and the West was begun.

Winnipeg.

Owing to a delay through the burning of a bridge on the railway near Schreiber, the party was not able to spend more than two or three hours in Winnipeg, a city which to the men from abroad was of special interest. They had all read of its rapid growth and present importance. However, they saw enough of the city to convince them that the descriptions they had read were not overdrawn.

At Winnipeg the party was met by Mr. Macpherson, who is in charge of this section of the Canadian Pacific Railway. The party is much indebted to Mr. Macpherson for the care which he took in making the trip westward go so smoothly. He sent his assistant, Mr. Dawson, with the party from Winnipeg, and at various points the party was joined by local representatives of the railway.

Medicine Hat.

The next point of mineral interest visited by the party was Medicine Hat. The trip over the prairie from Winnipeg westward was, however, greatly enjoyed. It seemed a new world. Many of the members of the party decided from the little they saw of the great wheat-raising provinces that Western Canada is indeed destined to become the granary of the Empire.

At Medicine Hat the party was met by the civic representatives of the town and by members of the Board of Trade. Medicine Hat's mineral industry, as is well known, is that of natural gas. They probably make more varied uses of this substance at Medicine Hat than is made of it in any other part of the world. They use it not only for domestic purposes, lighting and heating, but also in the boilers and forges of the Canadian Pacific Railway shops. They are now charging the cars with natural gas, and it is said that the supply of this gas on a car, when it is properly charged, will last longer than will the artificial gases that are ordinarily used for the purpose. Moreover, small pipes are strung along the rails of the track, and the gas is used for keeping locomotives warm when they are standing on the track waiting for orders during the winter. The party was given the opportunity of seeing these various uses which are made of natural gas, and they were also shown the methods by which the flow and pressure are measured.

The people of Medicine Hat are certainly enthusiastic concerning their town. Since the recent visit of Rudyard Kipling they are probably, to use a colloquialism, more "chesty" than ever. On the front page of some of the literature with which they supplied us they have Kipling's saying, as applied to their town, "The town that was born lucky." Moreover, Kipling seems to have been impressed with the immense store of natural gas which has been tapped in the town, and one would think that he favors the inorganic origin of gas as opposed to the organic, since he is quoted as saying, according to the literature supplied by the town, that "This district seems to have all hell for a basement." Mr. Coste, who, as we all know, has been a strong contender for the inorganic origin of gas, has apparently made a distinguished convert in Kipling.

A few miles out of Medicine Hat, at Dunmore Junction, Mr. Coste had arranged to show the party the gas well which had been drilled under his direction a short time before. After showing how the pressure was read and the flow of gas determined, the well was allowed to blow off, and was finally ignited.

Lethbridge.

According to the programme, the party was to visit Lethbridge and other mining camps along the Crow's Nest branch of the railway before coming to Fernie. Owing to the delay at Schreiber it was found necessary to alter the programme and to visit only two or three mines. Hence Lethbridge and some other important mining camps were passed by. At Lethbridge the Hon. Mr. Cushing, Minister of Public Works, Alberta, joined the party and spent the following day with it.

The great landslide at Frank was visited, and at Coleman the party met Mr. Whitesides, who had done so much in making arrangements for the visits to the coal district along the Crow's Nest Railway. A short visit was made to the mine at Coleman and to the newly erected plant at Hosmer.

Fernie.

Mr. G. G. S. Lindsey, president of the Crow's Nest Pass Coal Company, and Mr. R. W. Brock, acting director of the Dominion Geological Survey, joined the party at Winnipeg and accompanied it throughout the trip to Alberta and British Columbia. It is needless to say that both these gentlemen did much to make the trip a success. Having had Mr. Lindsey with us for a few days, we felt perfectly at home on arriving at Fernie, the headquarters of his company. A visit was made to Coal Creek and the mines there. Members of the party expressed themselves as being much impressed with the great coal deposits of this company. The staff took much pains in showing the excursionists through the mines and over the surface plant.

Although Fernie, a town of about 5,000 people, had been practically wiped out by fire a few weeks before our visit, the members of the party were surprised to see what had been done towards rebuilding in the interval. Building was going on not only during the daytime, but the hammers could be heard far into the night. The rapid rebuilding of the town greatly interested the visitors. They here saw something of the pluck, determination, and enthusiasm of the Western people.

Among the few buildings that escaped the great conflagration were the general offices of the Crow's Nest Company. Mr. Lindsey and his staff arranged a smoking concert for the party in the offices in the evening. Those who are acquainted with Mr. Lindsey's skill as an entertainer need not be told that this smoker was a great success. Mr. Lindsey not only made use of his staff, but he called on His Worship the Mayor of the town and on the Chief of Police. Having the Chief present, he was able to make some members of the party perform who had never shown any signs of possessing a "lighter vein" on the earlier stages of the trip. However, having a piper to lead us, we all succeeded in reaching the cars again some time after midnight.

Moyie.

The party left Fernie in the early hours of the morning, and spent the next forenoon in a visit to the mine

and plant of the St. Eugene mine at Moyie. This is the largest silver-lead mine in Canada, and the visit was much enjoyed. Proceeding from Moyie in the afternoon, the party, after leaving the railway, crossed Kootenay Lake to Nelson, where they were met by representatives of the Board of Trade and other gentlemen, who promised them a good time when they re-visited the town in a few days.

Bonnington Falls.

Leaving Nelson in the evening, the party made a night visit to Bonnington Falls, where power for several large mines and plants is developed. Mr. L. A. Campbell and his staff showed the party through this modern and attractive plant. The company, which is known as the West Kootenay Power and Light Co., Ltd., had prepared a pamphlet, giving an account of their plant, which was of much assistance to the guests on their visit, and now forms an interesting souvenir of the trip.

Trail.

Having to make up time lost on the earlier part of the trip, it was found necessary to visit both Trail and Rossland in the one day. This was unfortunate, as all the members of the party felt that they would like to have put in considerably more time in each place.

We arrived at Trail in the morning, and were met by the staff of the smelter and refining company, who showed us through their very interesting plant. Descriptions of this plant have appeared in the press, and it is not necessary to say more concerning it than that it proved to be one of the most interesting places visited during the whole trip. The electrolytic lead refining attracted much attention.

Rossland.

Leaving Trail, the party proceeded to Rossland, where they were met by the local committee, and were entertained at luncheon, afterwards visiting the various mines of the camp. The stay in Rossland was, of course, all too brief, but the party were shown some of the typical stopes and some of the deeper levels of the mines, and were gratified to see how promising the industry is at the present time. Between the visit to the mines and the banquet in the evening, the members were entertained at the attractive Rossland Club.

The banquet, which was presided over by Mr. A. J. McMillan, was a decided success.

The "Rossland Miner" of September 19th gives a full account of the visit of the Institute to Rossland, and is one of the most interesting newspaper issues concerning the excursion which was published during the trip.

Greenwood.

After the banquet at Rossland the party proceeded to Trail, and left for Greenwood, arriving there in the forenoon. They were met by Mr. Keffer, who was president of the Institute last year; Mr. McAllister, and other representative men of the district. A visit was then made to the British Columbia Copper Company's mine and smelter. This mine is of a different type than any we had seen on the trip, and it was a surprise, to some of the party at least, to see what was being done with ore of this grade. The ore body has been systematically blocked out and sampled. So far as the mining is concerned, there is no guesswork about the operations. The same may be said of the smelter. The party were interested in seeing how few men it took to operate this smelter.

As explained by Mr. Keffer and Mr. McAllister, the success of the operations of the British Columbia Copper Company depends on several factors. Firstly, the large size of the ore body; secondly, its uniform grade; thirdly, its being self-fluxing; fourthly, little or no timber being required in mining.

In the evening a smoker was held in Greenwood. This had its special features, but it is not our intention to go into details concerning any affair of this kind.

Phoenix and Grand Forks.

Leaving Greenwood, the party proceeded to Phoenix, where are situated the mine of the Granby company. At Nelson we had been joined by Mr. B. W. Hodges, the general manager of the Granby company. Mr. Hodges is the very active chairman of the British Columbia branch of the Institute, and had given considerable time to organizing the trip in British Columbia. At Phoenix he and his staff showed us over the extensive works and plant of the mine. Some idea of the size of the works can be gathered when it is said that 20,000,000 tons of ore are blocked out. This ore, like that of the British Columbia Company at Greenwood, is self-fluxing. After luncheon, provided by the company at Phoenix, the party left for Grand Forks to visit the Granby smelter. They were there met by the Mayor and other officials of the town, and given a hearty welcome to the town. It may be added that Grand Forks does not depend on the mineral industry alone, but that the surrounding district supports a very prosperous fruit industry. The Mayor and the gentlemen accompanying him made our welcome concrete by presenting us with some baskets and boxes of beautiful fruit of the district, together with several bouquets of their flowers to be used on our dining car.

The smelter at Grand Forks handles about 3,500 tons of ore a day, and it is said that in the not distant future 5,000 tons will be treated.

In the last volume of the transactions of the Institute an account of some of the operations of the Granby company is given. The paper which Mr. Hodges read during our visit to Victoria gives further details.

Nelson.

Leaving Grand Forks in the evening, the party proceeded to Nelson, where they were met by the local committee, of which Mr. Leslie Hill was chairman, and Mr. Beeston, secretary. As the members of the party had been somewhat strenuously at work since their arrival in British Columbia, the Nelson local committee thoughtfully decided to give them a day of rest. They had arranged to take the party on a trip up the beautiful Kootenay Lake, where we got glimpses of glaciers, views of fruit orchards and mineral springs, and at one point where we stopped some members of the party deserted us to enjoy themselves fishing for a few hours. Luncheon was served on the boat, and afterwards a call was made at the Blue Bell mine, where we were received by Mr. S. S. Fowler, who was president of the Institute some years ago. The Blue Bell mine is a type of ore body new to some of us. Its development and the treatment of its ore by Mr. Fowler will be followed with interest by many of the party. On the return trip to Nelson dinner was served on the boat. In fact, it may be called a banquet. Everyone was surprised at the successful way in which this large dinner was carried out on board the steamer. It is only necessary, however, to say in explanation that the service was under the direction of C. P. R. officials.

After dinner on the boat, Mr. Hodges showed that he

could do something more than run the largest metal mine in Canada and organize excursions. He showed that he had musical qualifications. He took charge of the piano, and, others assisting him, a successful musicale was given.

On arriving at Nelson about 9 o'clock it was found that our train would not leave till about midnight. The party was therefore invited to the Nelson Club to spend the intervening hours. It would not be well to describe in detail what happened at the club. Some members of the party might not be let go away from home again alone. One feature, however, of the entertainment at the club will be long remembered. It might be called the union of nationalities, six men, representing different nations, standing together on what we shall speak of as an elevated platform, and one after the other making a speech characteristic of his country. The performance with the interpreter was especially good.

Revelstoke.

The party left Nelson and proceeded to the Arrow lakes, where boat was taken to Arrowhead, our cars having been ferried across ahead of us. From Arrowhead we proceeded to Revelstoke. The scenery on both the lake and in the vicinity of Revelstoke proved very attractive to most of the party, as did also the trip through the Fraser Canyon and on to Vancouver.

Victoria.

We left Vancouver by steamer in the forenoon for Victoria, where it was intended that we should have a restful time for two or three days. After dinner, at the hotel, the Mayor of Victoria welcomed the members of the excursion party to his city. Next morning a meeting of the western branch of the Institute was held in the Parliament Buildings. Mr. Hodges presided at this meeting, and the excursionists were welcomed by Premier McBride, who is also Minister of Mines for British Columbia, and by the Hon. William Templeman, Minister of Mines of the Dominion, whose home city is Victoria.

After these addresses of welcome, papers were read by Mr. Sutton on "The Geology of Vancouver Island," by Mr. Hodges, on "The Granby Mines," and by Mr. Ashworth, on "Coal Dust." All these papers proved to be of live interest.

During the rest of our stay in Victoria several entertainments were provided, the Lieutenant-Governor inviting the excursionists to a garden party at Government House, and a reception was held by the Premier and representatives of the Government in the Parliament Buildings on one of the evenings. The members of the party were also the guests of the Victoria Exhibition Directors.

Most of us had heard that Victoria is a very attractive city, and we were not disappointed in our visit to it. One thing that strikes the visitor is the extensive grounds with the beautiful trees which surround so many of the residences. One might say that

"Here lawns extend that scorn Arcadian pride."

Nanaimo.

On the morning of September 24th the party took train from Victoria for Nanaimo. This proved an attractive trip through the island. We stopped for a short visit at the plant of the Tyee Copper Company smelter, at Ladysmith, where we saw the unloading of ore from some of the northern islands. Being so well situated as regards water transportation, this smelter should get a varied supply of ore from the deposits which are known to occur on the coast of British Columbia.

Arriving at Nanaimo, we were received by members of the city corporation and others and entertained at luncheon. In the afternoon the party was taken in carriages to the collieries of the Western Fuel Company. A number of the members of the party went underground and spent some time in viewing the works. After leaving the collieries the party was taken on a visit to the Hamilton Powder Company's extensive plant, which proved to be an interesting and novel visit.

In the evening the party were the guests of the people of Nanaimo at a dinner, at which the Mayor presided. Altogether, our trip to Nanaimo was a very pleasant and instructive one.

During our stay on Vancouver Island Mr. E. Jacobs, secretary of the western branch of the Institute, did much to smooth our way and make the trip a success.

Vancouver.

We took steamer at 7 o'clock in the morning from Nanaimo for Vancouver. On arriving at Vancouver we were met by the local committee and were taken in automobiles through the beautiful Stanley Park and around the city.

The City Council, Board of Trade and Stock Exchange had arranged for our entertainment in Vancouver. The local members of the Institute had been very active in furthering arrangements, and it can be said that the luncheon in the Vancouver Hotel was one of the most succesfsul functions of the trip. Mayor Bethune presided, and addresses were made by the Hon. Carter-Cotton, Mr. Waghorn, and others. The vsitors were loud in their praise of Vancouver city. It has had a more rapid growth than almost any city in Canada, and now presents a most substantial appearance. Nature has done a great deal for the city. It has splendid harbor facilities, probably the purest water supply of any city of its size in Canada, and a most magnificent park.

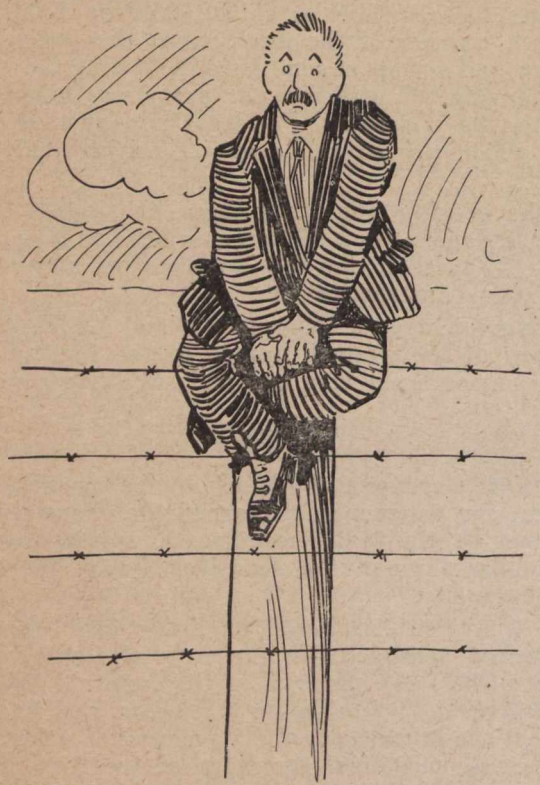
The Return Journey.

The party left Vancouver in the afternoon on the return trip, the cars having been cleaned and re-stocked during our visit to Vancouver Island. At Revelstoke Mr. Lindsey and two or three other members of the party left us, they going via Nelson to Fernie. The trip through the mountains eastward could not have been more pleasant. The weather was clear and fine, and the glaciers and other natural beauties of this famous region showed at their best.

Nor was a sight of big game lacking on this trip through the mountains. Members of the party are not quite certain, even now, whether the bears which Mr. Brock pointed out to them at the foot of a slide were tame ones or not. He had been telling some members of the party what they thought were pretty tall bear stories, and he had told them that he would show them some bears along the route. Sure enough, a short distance west of Glacier he pointed to a black specimen and a brown one at no great distance from the track. The brown one seemed to be almost too unconcerned to be in his native state. Some of us suspected that Mr. Brock had got one of his friends to let his tame bears loose for our bentfit—and for his reputation!

Calgary.

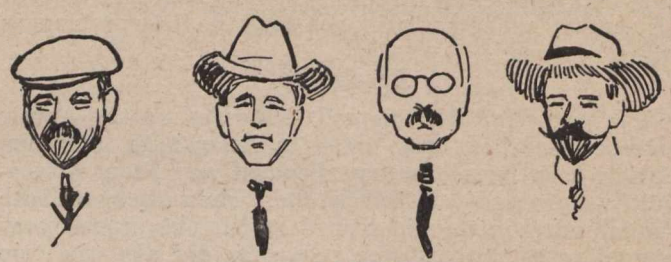
During the visit to Nelson the members of our party had met Mr. P. Burns. There must have been some kindred spirits in the party—that is, kindred to Mr. Burns—as we there and then received an invitation to visit his ranch at Calgary on our trip east.



ST. SIMEON OF CALGARY.

On our arriving at this progressive and rapidly growing city we were met by Mr. Burns and other men of the city and were escorted in automobiles to Mr. Burns' stock yards, where an exhibition was first given of broncho-busting. Mr. Burns had had his men collect some of the worst outlaw horses in the district. He had also invited some of the champion riders of the country to be present, and the exhibition that was given was certainly true to life, to say the least. We all feel that we have seen some of the best riders and the best buckers of the West.

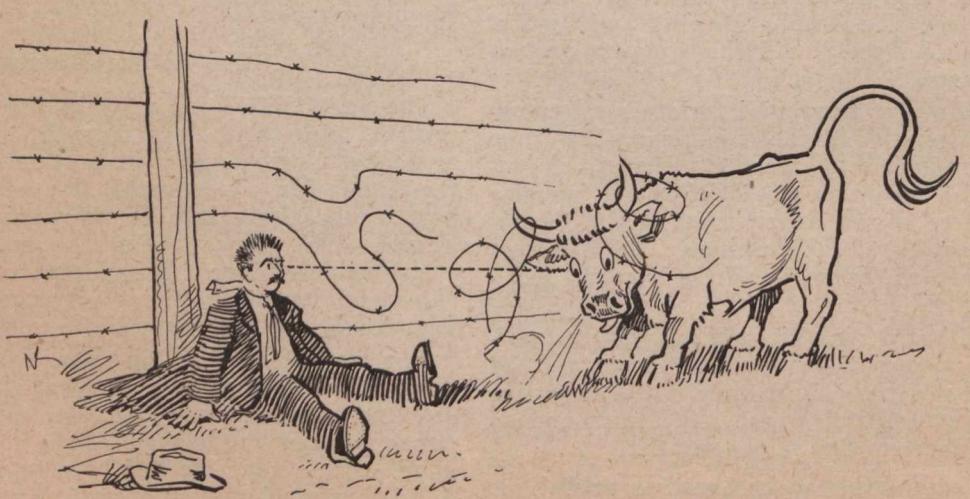
But while the broncho-busting part of Mr. Burns' entertainment was good, the second part, the cattle-taming exhibition, was even better. In an enclosure with a barbed wire fence six strands high, facing the open prairie, Mr. Burns' men had collected some of the wildest and best-running steers in the territory. When the party had gathered at the side of the enclosure these steers were led out one or two at a time, and the horesmen showed their skill in roping them. All went well until about the sixth steer had been given his chance of getting away on the prairie. This animal was one of the wide-horned Texan variety. He ran out on the prairie for three or four hundred yards, and was finally roped by a rider. The saddle-girth broke, and the rider was unhorsed. In the mix-up the steer lost his bearings, and appeared to the crowd to charge the prostrate rider, who, however, succeeded in rolling out of his way. The steer then came back towards the enclosure and directly towards a group of forty or fifty men who were bunched near the high wire fence. Every man in the party thought the steer was coming straight for him. With tail up and head down, on came the steer,



SOME OF THE PRINCIPALS.

"Untired, untamed, and worse than wild."

The men meanwhile tried climbing the fence. The Cobalt representative, being used to climbing mine ladders, succeeded in reaching the top of the highest post, and felt secure resting on its top. He sympathized with his fellows as the steer rushed by. Unfortunately, a few yards beyond the party the steer charged the fence and went straight through it. This charge of the steer shook the Cobalt man off the top of the post, and when he picked himself up he was inside the enclosure facing the steer. All that he had ever read of matadors in the ring flashed through his mind. He made an



THE CRISIS.

heroic effort and succeeded in cowing the animal by mind power. The steer turned away, and the Cobalt man again climbed the post. Other members of the party were not so fortunate. At least fifteen men had bleeding hands, cut by the wire, and many articles of clothing, torn on the fence, had to be discarded. Doubtless Mr. Burns' entertainment will be remembered by the excursionists when many of the mining camps are forgotten. On the way eastward, two or three days after the Calgary visit, one of the members was heard to say,

"It Burns at Calgary."

While on the subject of ranching, it may be added that when we first got into the cattle country on our way west one of the members of the party asked: "Do the cowboys milk the cows?"

Conclusion.

After leaving Calgary the party proceeded directly to Montreal, arriving on October 2nd, where a number of the members from abroad took their ships a day or two after.

In the foregoing account of the trip it has been impossible, owing to lack of space, to say more than a few words on each locality visited. Many of the mines and plants have, however, been described in technical journals, and doubtless a number of papers will be published by members of the excursion. The men from abroad frequentely commented favorably on the literature with which they were furnished on the trip. This literature included geological descriptions and mining data on nearly every locality visited.

COBALT COMMENTS.

ALEX. GRAY.

Scientists Must Decide.—By common censent the Montreal River and its tributaries traverse territory regarded by field geologists as the heir-presumptive or heir-apparent to Cobalt. What the division of the unentailed estate is likely to be only the specialist in prospectus lexicography will attempt to detail. He has already bequeathed putative wealth "surpassing" Cobalt and a "rush," which means to mining investors that they need not "come early" if they would "avoid the rush." Cobalt was the very rare exception where "first come, first served" rewards obtained. Too frequently mining vistas have "dead ends," and before Elk City's suburbs become fashionably residential and industrial, it will be material that the "surpassing" business be carefully managed, "Fly City" being the solitary urban centre where the preposterous spells prosperous. There has been less of the vainglorious about the Montreal River mineralized areas. Early settlers were unsettled by stratigraphic innovations and affected by objurgations directed at Cobalt promoters. They staked "conglomerate," blazed their way around quartzite, uncovered what they could for "discovery" purposes, and "snowshoed" what they could not find. Blizzards and "black flies" were not deterrents; yet what violent fluctuations there were in the market for claims had a downward tendency until ciphers began to be lopped off the affixes, and numerals prefixed were modified in inverse ratio. The scientist (and the capitalist behind him) was more omniscient than omnipresent. Too much gas was leaking from Cobalt's balloon and Montreal River claim owners perforce had to resort to the perachute. It has followed that a course in the school of adversity has effected more of reason than of riches, and without traversing the contentions of specialists as to Cobalt's superiority, the undemonstrative scientist has put the intelligent prospector in the middle of the thoroughfare. Without that scientist the accommodations at Elk City would not have been augmented and "assessment work" would be the limit of development in other than isolated instances. With that scientist there is no "rush," stampede or scrimmage. He has not been entirely satisfied with the fissuring in some of the townships; he has been thoroughly dissatisfied with the tactics of those who undertook to make claims-mongering a menace to the mining sciences. Ultimately rationalism has prevailed and there is a likelihood of equitable arrangements by which the party of the first part will not deprive the party of the second part of his hope of future reward and incidentally consign the section to demnition. As a further compromise Gowganda might be the metropolis and re-christened Barlow, leaving it for that scientifically named ste to contest for honors with Miller. In either event there need be no "rush" nor is it advisable to have recurrecnes of such incidents as the following, related in a Renfrew paper:

"At Gowganda Lake slabs weighing 40 pounds are removed without putting in a shot. At that point there are some 1,500 men, with the transportation problem one of the most serious ones confronting them. Every owner of a canoe carries his paddle with him when leaving the water, to guard against the disappearance of his canoe in his absence. What he calls a Marathon race, with a mine as the prize, Mr. Connolly saw during his trip. A dispute arose as to the ownership of a claim and the mining inspector was asked to settle the question. Two men each represented the rival claimants, and upon a decision being arrived at in the recorder's office two canoes moved off at top speed for a new staking of claims. The distance to be travelled was fifty miles. One of the men in the race was a Renfrewite. One couple upon arriving within eighteen miles of the coveted claim set off some dynamite, as a signal to men stationed farther in and these in turn passed the signal along, resulting in a new staking taking place, one of the claimants beating the other by a good margin. Such is life n a mining country."

Is it a coincidence that the signal was pre-arranged? Verb. sap. More of this on the "rush" would make "life in a mining country" an excellent thing to forego.

Economic Cross Purposes at Cobalt.—Events in the north country, apart from trapping and lumbering, had their beginning when those Canadians, McKinley, Darragh, the McMartins, La Rose, Hebert, Trethewey, Longwell and, above all, Miller, discovered and diagnosed cobalt. Gradually this fact has been brought home to Canadian men of affairs, but the dawning has been so unnecessarily prolonged that those who should have been the beneficiaries now must be satisfied with seats at "the second table." It is undoubted that the

business interests of the Dominion were slow to realize the potentialites of Cobalt. They are hardly awake to the accumulating possibilities and probabilities of the districts surrounding Cobalt—districts quickly appealing to alert aliens with affinities for the best there is and more of the same. Probably these sources of profit are as safely conserved in New York as they would have been in the custody of "original owners." They were financed in the States because Canada defaulted. Inevitably the larger and richer areas have gravitated to the pockets of these who really took few risks when they assumed well-guaged certainties, and so five prosperous companies which have paid 53 per cent. of all the dividends from sixteen companies at Cobalt are directed from Broadway, Buffalo and Rochester. These companies have sent away about 60 per cent. of Cobalt's output. Nine of the producing non-dividend companies have New York control. Three are in the crucibles. Perhaps it does not matter so much so long as more mineralized sections are being opened out, but the indifference of dominant forces in Canadian communities to the precious metal contents of the north country will either have to be modified or there should be a surcease from grouching when Americans appropriate "the persimmous."

It is not a matter for off-hand criticism that plums have been plucked by those with the quickest and longest reach. Rather is it a subject for review to be taken as a course in neighborly affection and co-operation without being inhospitable toward visitors with credits at their disposal. Then the equities will be preserved and more of the La Rose net earnings of $3,850 per working day will revert to "the place of issue," more of the Nipissing profits in corresponding degree will remain here, along with the daily proceeds of about $2,500 from the Coniagas; and the Kerr Lake Company's daily contribution of about $2,525 will also be balanced between residents south of the Bronx and those north of the Great Lakes.

What Canada loses by its liberality, notwithstanding the La Rose cannot be said to have involved a sacrifice is displayed in the profit sheet of these standard mines. Not alone have losses in minerals unaccounted for been grievous, and refining costs adverse until within this year, but much of the power of the wealth produced has been directed toward the purchase of more of the mines, until the whole situation becomes such as to warrant at least more than casual comment.

To make it clearer that while millions are being made at Cobalt, millions more could be saved there these figures are offered with the morals they contain:

NIPISSING'S COMPLETE SCORE SHEET.

	1904	1905	1906	1907	Aug. 1, 1908	Grand Total
Cars—	2	20	81	88	53	244
Dry weight, pounds.....	124,659	939,373	4,018,587	4,804,426	2,793,148	12,680,193
SILVER—						
Contents, ounces	32.13	753,153.90	2,239,832.07	2,241,506.01	1,724,050.57	6,958,574.68
Ounces paid for.....		706,193.96	2,087,463.07	2,090,631.26	1,604,365.92	6,488,654.21
Value, less mktg. costs, $		424,936.16	1,390,343.61	1,269,645.46	850,614.49	3,935,539.74
NICKEL—						
*Contents, lbs.	8,475	45,684	71,521.21	71,914.17	13,112	210,706.38
Receipts, $.....	635.05	370.93	4,276.48	708.33		5,990.79
COBALT—						
*Contents, lbs.	18,533	90,496.17	156,356.71	107,413.69	73,896.53	446,696.10
Receipts, $	23,148.03	58,005.38	96,236.11	39,281.89	17,680.04	228,351.45
ARSENIC—						
*Contents, lbs.	76,249	288,995.32		130,950.05	237,280	727,474.37
Receipts, $	350.82			588.79		969.61
TOTALS OF						
Value received, $.....	24,163.90	477,312.47	1,490,856.20	1,310,224.49	868,294.53	4,170,857.59
By-products unmarketed.						40,060.00

*Only applies to ore assayed for these metals and for which payments were made.

SOME LA ROSE ESTIMATED RETURNS BY CONTRAST.

	1904	1905	1906	1907	To May 31 1908	Grand Total
Dry weight, lbs.	84,439	168,478	751,807	418,860	331,846	1,755,439
SILVER—						
Contents, ounces	69,605.73	117,768.84	1,217,658.54	546,092.48	363,507.63	2,314,633.21
Value, gross, $.....	38,291.84	82,308.92	828,791.16	345,395.34	199,785.20	1,494,592.46
Value, net, $.....	34,478.28	*82,131.62	742,263.06	316,271.53	181,489.33	1,356,633.82
COBALT, NICKEL, ARSENIC—						
Value, net, $.....		7,367.52				7,367.52
Totals of Value—						
Received, $	34,478.28	84,499.14	742,263.06	316,271.53	89.33	1,364,001.34

*Including cobalt, nickel and arsenic.

ANALYSIS.

Nipissing, gross value per ton shipped	$657.86
La Rose, gross value per ton shipped	1,700.10
Nipissing, net value per ton on silver contents	620.71
La Rose, net value per ton on silver contents	1,534.00
Nipissing, average per ton on cobalt, nickel, arsenic contents	37.10
La Rose, net value per ton on cobalt, nickel, arsenic contents	8.39

To mining men these tables represent profits and losses on contained minerals. To Canadian men of affairs they represent incidental trade and about 25 per cent. of the gross value of the products—enough if there was more of it and if the other two or three quarters were restored upon Canadian terms. Instead of this the attitude of Canada has been either passive or repellant toward its mining fields, and its surplus funds are scattered all the way from the Rio Grande to Terra del Fuego, while even the economies essential to the

local treatment of Cobalt's complex ores are in "the other fellow's" balances, vide the foregoing data and this from the annual statement of the managing director of another prosperous mining company, the Kerr Lake:

"The price of silver during the year has fluctuated greatly. Last year we obtained an average of 67¾ cents per ounce for our silver, while this year we have been forced to sell it as low as 51¼ cents. This condition cannot remain for any great length of time, as the metal is now far below the normal price. Under the existing conditions we are producing only sufficient ore for our requirements, which are our quarterly dividend of $90,000 and our working expense and outlay for additions and improvements, averaging about $15,000 per month. The marketing of our product has been a very serious matter, inasmuch as the smelting works were unwilling to buy the very rich ore which we produce, owing to the difficulty of gettng a correct sample by the ordinary means common in the purchase of silver ores. We attempted to cupel, or reduce, the entire amount of our shipments by melting the ore down and taking the resulting silver, but the losses by and the cost of this method we found to be so great that we abandoned it. Experiments at the mine have been undertaken during the year by our engineer, whereby a good deal of the meal is separated from the ore before it is shipped. In July, for instance, 1,000 lbs. of native silver were taken from the ore by the simple process of crushing and screening. By carrying this method a little further we will be enabled to ship ore to the smelters which can be sampled with less difficulty, and marketed, we believe, without the troubles which have been encountered during the past year."

Not only is it in evidence that Nipissing, La Rose and Kerr Lake have been earning large percentages for owners. It also is painfully apparent that silver on the down grade and involved in precarious markets was handicapped by the "undesirables" associated with it in the form of cobalt, niccolite, arsenic. At the Coniagas and O'Brien it is not so. Everywhere else economic minerals associated with the silver have proved to be hardships leaving it for the richer properties to meet their obligations out of the silver. The Nipissing alone throughout has made the subordinate metals a substantially profitable factor. Others have come into line under the leadership of La Rose, O'Brien, Coniagas, Buffalo, Trethewey, McKinley-Darragh, Hudson Bay and Right of Way. Concentration of lower grade ores and "crushing and screening" as prescribed for the Kerr Lake and Nova Scotia, will doubtless alter the complexion of balance sheets; but the Government sampler would materially aid in this if its erection is not to be indefinitely deferred. None of the mines will acquiesce in the metallurgical reprisals of the past. They cannot. Had the La Rose been mined as scientifically as it is under the present administration it would have had more to show for it; and if the Coniagas smelter at Thorold will elaborate the advantages of its imperium in imperio policy from drill bit to refinery, Cobalt will be better able to demand the support so grudgingly granted by all but outside capitalists, and almost denied by Canadian financiers.

Great pressure is used in manufacturing the new shingles of asbestos-fibre and Portland cement, and they absorb only 5 per cent. of their weight of water. Hydration and gradual crystallization on exposure on roofs make them absolutely impermeable.

BEHREND DRY CONCENTRATOR TEST.

Milton L. Hersey Co., Ltd. Montreal, Aug. 8, 1908.

Certificate of Assay.

Sample of Cobalt ore received from Mr. Louis B. Jennings, Corona Hotel, Montreal, marked "Heads, Cobalt Lake Dump": Gold, none; silver, 35.5 ozs. per ton of 2,000 lbs., value per ton $18.81; cobalt, 1.57%; nickel, 3.10%. Silver at 53c per oz.

September 10, 1908.

Sample of ore crushed, received from Mr. Louis B. Jennings, Corona Hotel, Montreal, marked "Concentrates, Cobalt Lake Dump": Silver, 149.1 ozs. per ton, value per ton $76.04; cobalt, 7.06%; nickel, 18.07%. Silver at 51c per oz.

Sample of ore crushed, received from Mr. Louis B. Jennings, Corona Hotel, Montreal, marked "Tails, Cobalt Lake Dump": Silver, 12.0 ozs. per ton, value per ton $6.12; cobalt, 0.17%; nickel, 0.94%. Silver at 51c per oz.

OHIO COAL MINES.

The following act was drafted at the instance of the Ohio miners, and passed by the last session of the Ohio Legislature, becoming a law on the 3rd inst.:—

An Act Governing Power, Other Explosives, and Blasting in Coal Mines.

Be it enacted by the General Assembly of the State of Ohio:—

Section 1. Storing blasting powder or other explosives.—No blasting powder or other explosives shall be stored in any coal mine, and all powder sold to miners by the keg shall be packed in kegs which have an opening at the edge two inches in circumference, and that can be conveniently opened, to avoid the dangerous use of picks to open the same; and no workman shall have at any one time more than one 25-pound keg of black powder in the mine, nor more than three pounds of high explosives; and no explosive shall be taken into or out of any part of the mine in mine cars propelled by electric power; and no person shall keep blasting powder, or explosives, dangerously near the electric wire or power cable in any part of the mine where electric wires are in use.

(a) Boxing and Distance.—Every person who has powder or other explosives in a mine, shall keep it or them in a wooden or metallic box or boxes, securely locked, and said boxes shall be kept at least five feet from the track, and no two powder boxes shall be kept within twenty-five feet of each other, nor shall black powder and high explosives be kept in the same box.

(b) Handling Explosives.—Whenever a workman is about to open a box or keg containing powder or other explosives, and while handling the same, he shall place and keep his lamp at least five feet distant from said explosive and in such position that the air current can not convey sparks to it, and no person shall approach nearer than five feet to any open box containing powder or other explosives with a lighted lamp, lighted pipe or other thing containing fire.

(c) Tamping.—In the process of charging and tamping a hole, whenever in the opinion of the mining department this becomes necessary, the needle used in preparing a blast shall be made of copper, and the

tamping bar shall be tipped with at least five inches of copper. No coal dust nor any material that is inflammable, or that may create a spark, shall be used for tamping, and some soft material must always be placed next to the cartridge or explosive.

(d) Firing Shot.—A miner who is about to fire a shot with a manufactured squib shall not shorten the match, saturate it with mineral oil nor ignite it except at the extreme end; he shall see that all persons are out of danger from the probable effects of such shot, and if it be a rib shot, he shall notify the person or persons working next to him on said rib before said shot, and shall take measures to prevent anyone approaching by shouting "fire" immediately before lighting the fuse; no person shall return to a missed shot until five minutes have elapsed. And when it is necessary to tamp dynamite, nothing but a wooden tamper shall be used.

Section 2. Penalty.—Any person violating any part of this Act shall be deemed guilty of a misdemeanor, and upon conviction be fined, not more than one hundred dollars, nor less than five dollars, at the discretion of the court.

Section 3. This Act shall take effect and be in force six months after passage.

CONDITIONS OF EMPLOYMENT IN NOVA SCOTIA COAL MINES.

Coal mining companies, operating in Nova Scotia, are required to keep in the office at the mine a register, in which are kept the name, age, residence, and date of first employment of all persons employed in connection with the mine. These registers must be produced at the request of any provincial or district inspector, who has the privilege of copying them.

No boy under the age of sixteen is permitted to work below ground, and no boy between the ages of twelve and sixteen years is permitted to work above ground unless he can furnish a certificate from a duly qualified provincial teacher to the effect that he is able to read and write and is familiar with the rules of arithmetic as far as and including division. No woman or girl of any age is permitted to be employed in the workings of any mine.

EXCHANGES.

The South African Mining Journal, September 5, 1908.—An editorial on the outlook for the Rand is cheerfully optimistic. "A silent industrial revolution has been effected in these fields. The inefficiency, waste and extravagance that characterized the early days of every mining field have been swept away. Not only of the Rand, as they characterized the early days has a striking reduction in costs been achieved, but things have been put in trim for a still further reduction." One of the leading mining firms has appointed as its adviser a consulting engineer whose experience has been confined to the organization and operation of Welsh coal mines, "where the saving of a fraction of a penny per ton is a matter of infinite pains and moments." This is taken as a promising sign.

The Mining World, October 10, 1908.—The first of a series of articles on "Some of the Large Stamp Mills of the World" appears in this number of our contemporary. C. C. Christensen is the author. The Alaska Treadwell and the Alaska Mexican mills are the subjects of this installment. In the 300-stamp mill of the Alaska Treadwell Mining Company two series of 150 stamps are arranged back to back. The stamps are grouped in double batteries of five stamps each. Wooden pulleys, 72 inches diameter by 15-inch face, keyed on the outer ends of the cam shaft, receive the power for each set.

The 1,050-lb. stamps are lifted by double cams, and drop 97 times per minute, in order 1, 3, 5, 4, 2, crushing an average in a year's run 5½ tons ore per stamp per 24 hours.

Steel shoes, heads, tappets, and cams are used. Iron dies are made in the company's foundry. One pound of chrome and Koppel steel in the shoes will crush about 3 tons of ore, and one pound of iron in the dies will crush about 4.4 tons.

The Iron and Coal Trades Review, October 9, 1908.—The current number of the Review demonstrates the probability of the development of an English market for French Lorraine iron ores. The export of this ore is a necessary feature at the present stage of France's coal production. France is quite unable to use all of her own iron ore output. Great Britain should be a purchaser in the near future.

The Mexican Mining Journal, October, 1908.—This number of our excellent southern contemporary contains a short paper on cyanide practice at Pachuca. The author, Mr. E. O. Daue, brings out several useful points. Cyanide practice at Pachuca has not become uniform enough to be described as typical of the district. On many points there are still divergences. At the Hacienda Lorato the ore, consisting approximately of 75% quartz, 5% alumina, 5% calcite, with some pyrite and a little pyrolusite, and containing 1.1 kilos silver per metric ton, is crushed to about 1½ inch ring by four 7x10 Blake crushers. In the stamp mill the ore is crushed through a 16-mesh screen in a 0.02 to 0.04% cyanide solution. The stamp mill consists of twenty 1,050-lb. stamps, dropping 106 per minute. The pulp passes to 8 Wilfley tables, and the taling from these tables to a series of 14 Pachuca chain mills. The mills grind the pulp to 40-mesh, and are supplied with additional coarse ore up to their capacity. The coarse ore prevents sliming, and increases the capacity of the mills. From the mills the pulp passes to a series of cones, the overflow going to a series of Johnston tables and the underflow to another series of the same tables. There are 38 of these tables in all. The tailing is elevated to two Dorr classifiers, where the sand and slime are separated. The slime flows directly to cyanide tanks; the sand is re-ground in three tube mills and returned to the classifiers. The pulp fed to the cyanide plant gave the following results:—

Remaining in 100 mesh...	5.1%	— 607	—3.0
Remaining in 120 mesh...	20.6%	— 641	—3.0
Remaining in 200 mesh...	29.3%	— 718	—3.0
Remaining in 200 mesh...	36.0%	—1,082	—5.5

The theoretical extraction on this plant is 87%.

At the Hacienda, San Francisco, the Brown system of air agitation is in use. Here the extraction is about 90%.

PERSONAL AND GENERAL.

List of members elected at Council meeting, held October 10th, 1908:—

Members—Roger Beck, Swansea, South Wales, Eng.; W. Chas. Carter, care Dominion Iron & Steel Co., Ltd., Sydney, N.S.; Norman R. Fisher, B.Sc., M.E., Cobalt, Ont; H. L. Kerr, 68 Admiral Road, Toronto, Ont.; J. W. Powell, Coleman, Alta.; Dolph Rosewarne, M.E., care Mr. Cecil M. Bryant, Vancouver, B.C.; L. R. Symmes, Giroux Lakes, Ont.

Associates—K. C. Allen, care Le Roi Mining Co., Ltd., Rossland, B.C.; Alex. M. Bilsky, Cobalt, Ont.; Sydney Smith, General Manager Duchess Silver Mining Co., Ltd., Cobalt, Ont.; Milton Steindler, care Kerr Lake Mine, Cobalt, Ont.; Alfred J. Young, North Bay, Ont.

Student—Athur F. Braid, Sewaren, N.J., U.S.A.

The death is announced of Mr. Bennett H. Brough, Secretary of the Iron and Steel Institute. Mr. Brough died on Saturday, October 3rd, at Newcastle-on-Tyne.

Mr. Brough was born 48 years ago. His technical education was gained on the Continent and in England. In 1886 he was appointed instructor in mine surveying at the Royal School of Mines. Seven years later he accepted the secretaryship of the Iron and Steel Institute. Mr. Brough's best known work is his textbook on mine-surveying. This volume, now in its twelfth edition, is widely used. Of his other important contributions to mining literature there is not space for detailed mention. It is sufficient to say that he was a vigorous and well-informed writer. His services were in constant demand, both as a contributor to the press and as an organizer.

INDUSTRIAL PAGE.

WAY'S POCKET SMELTER.

In California there is a company manufacturing a pocket smelter for testing ores, which is proving a success. Way's Pocket Smelter Company, of South Pasadena, California, are marketing this useful outfit, which consists of a small tablet about the size of an ordinary playing domino, one side of which is liberally indented.

In composition it is carbon, subjected to a mechanical treatment which gives it a fluxing and reducing quality, rendering it highly combustible. This tablet furnishes the necessary furnace, heat, and crucible without, apparently, containing either. Tests are made by pulverizing the ore in a small iron mortar, furnished with the outfit. The finely powdered ore is then spread evenly over the tablet, and when a match is applied burns rapidly, leaving a tablet the same shape and size, apparently of charcoal. The ore, however, is reduced, and is in the burned tablet, in a finely divided metallic condition. This burned tablet is then put in the glass mortar, thoroughly ground and "panned." If there is any metal in the rock it will be plainly visible against the dark green glass of the mortar. The smelter will reduce to a metallic state ores containing gold, silver, patinum, copper, tin, lead, bismuth, zinc, etc., and will enable the prospector to quickly determine whether or not any rock carries "values." This simple device will enable one to readily ascertain by reliable test the contents of any rock.

With Way's pocket smelter and a few simple tools in his kit the prospector, or anyone with an observant eye, is completely equipped for the discovery of valuable metals. The complete pocket smelter outfit, ready for use in the field, contains everything necessary (except acid, which can be procured anywhere) for immediate utilization. It contains one box of smelters (30 tests); one iron mortar and pestle (special design); one green glass mortar and pestle; one patented dropping bottle and case; one double lens magnifying glass; one 40-mesh screen; magnet, and complete instructions. This outfit, securely packed, sells for $5.00. A smaller outfit is also put up, which consists of one box of smelters; one patent dropping bottle and case; one iron and one green glass mortar, and complete instructions, for $3.50. With the use of Way's pocket smelter you can accurately determine, on the ground, the metal contents of any ore at a cost of only 5 cents for each test. The manufacturers find that about 75 per cent. of their sales are made to mining companies. Inquiring into the matter, they ascertained that the mining companies make preliminary tests at the mine on ores, and send only those which show values to be assayed. This saves the mining companies considerable money in the course of a year. By writing Way's Pocket Smelter Company, Box 945, South Pasadena, California, you can get a free copy of the "Prospector's Friend," a valuable booklet, which explains in detail the pocket smelter outfit and other valuable information for mining men and prospectors.

Franklin Air Compressors, Catalogue No. 26, Chicago Pneumatic Tool Company, Chicago.—Frank compressors are built in more than one hundred sizes and styles, to suit all purposes from motor hoists to pumping natural gas. In design these compressors follow the most approved steam engine practice, working along original lines only in details vital to economical air compression. The catalogue before us illustrates all essential varieties.

J Edition, Catalogue of W. F. Stanley & Company, Surveying, Engineering, and Mathematical Instruments, 286 High Holborn, London, W.—In this well-prepared catalogue, amongst a complete range of surveying and engineering instruments, illustrations are shown of several complete mine surveying outfits. The Stanley instruments have a world-wide reputation.

Ackroyd & Best's Safety Lamps are described in a recently issued catalogue. Many advantages are claimed for this make of safety lamp. It need not be lighted until it is actually needed. Lighting takes but a few seconds. Underground re-lighters are supplied whereby a lost flame can be replaced quickly and safely. The lamp can be cleaned rapidly, filled expeditiously and cleanly. It can be opened only by means of a powerful electro-magnet.

Messrs. Ackroyd & Best have introduced a Maintenance Contract System, under which they supply

their patent lamps, together with lamp-room igniting and magnetic unlocking apparatus, oil filling machine, one safety underground re-lighter for each 100 lamps, together with oil having flash point of at least 250° as required for working single shifts, wicks, and renewals; for a small weekly sum, payable monthly.

Colorado Iron Works Company, Denver, U.S.A., Catalogue No. 10 B., Cyanide Plants, Machinery, Tanks, and Appliances.—The modern trade catalogue is often quite as instructive and, not seldom, much more interesting than the usual text-book. Catalogue 10 B is one of the best conceived that we have seen in a long time.

The catalogue proper is preceded by a short description of the cyanide process, which is clear, concise, complete, and suitably illustrated. In fact, this preliminary treatise should prove most instructive to anyone interested in gold milling. The catalogue includes ample descriptions of all cyanide plant accessories.

The Hill Clutch Company, Cleveland, Ohio, have published an illustrated catalogue dealing with their collar oiling bearing and the various attachments. Full specifications are included. The Hill Patent Collar Oiling Bearing is so constructed that it will not leak nor will the oil creep along the shaft. There is no waste of oil. It operates for months with one filling.

Wire Ropes.—This is the title of an attractive catalogue issued by **W. B. Brown & Co. (Bankhall), Limited,** whose head office is 63 new Broad Street, London, E.C. W. B. Brown & Co. are manufacturers of steel wire ropes and cables for mining, aerial cableways, tramways, suspension bridges, shipping, and all engineering purposes.

In the construction of their steel ropes W. B. Brown & Co. exercise the most minute care. The material is selected after close inspection. Every wire used is tested for breaking strain, elongation, torsion, and flexion, and a record is kept of the wire retained for manufacture. Regularity and evenness of the material used is thereby ensured. The history of tests performed on each rope is kept on record, and is always open for reference. This makes possible an exact repeat order, and buyers can depend upon getting at any time a repeat rope of exactly the same quality as its predecessor.

The catalogue contains useful information concerning the handling and care of ropes. Full specifications of sizes and grades are given, together with tables for determining the diameter of rope suitable for given loads. Many incidental attachments are illustrated. An ordering telegraph code is appended.

Bulletin No. 1428, received from the Allis-Chalmers Company, Milwaukee, is an article on the Allis-Chalmers hydraulically operated copper converters, reprinted from the Mining and Scientific Press. It describes an installation of two hydraulically operated stands and eight shells, 96 inches by 150 inches long. Each converter of these dimensions, assuming six charges per stand per 24 hours, and 26 working days per month, has a capacity of about 1,250,000 lbs. copper per month. The tuyere arrangement is especially to be commended.

Special Publication No. 7061. Canadian Westinghouse Company, Limited, Hamilton, Ont.—The Baldwin-Westinghouse electric locomotion for mining and industrial traction are here well described. The co-operation of the Baldwin Locomotion Works with the Canadian Westinghouse Company is a guarantee of the best modern locomotion design along with the electrical equipment. Electric haulage is clean and economical. By its use fire risks are removed in working around inflammable material. This catalogue sets forth the subject completely.

Perforated Metal, Bulletin 1425, Allis-Chalmers Company, Montreal.—The Allis-Chalmers people outline in this bulletin a few of their ranges of perforated sheet metal. Mining screens, grizzleys, screen plates, separators for coal, ore, phosphates, etc., are included. Full directions as to ordering are presented on the third page.

The Lea-Degen High-Duty Turbine Pump, Bulletin G, The Lea Equipment Company.—The Lea-Degen high-duty turbine pump is built in separable unite, and is parted both horizontally and vertically. These parts can be assembled rapidly and re-assembled in any desired combination. The trouble of packing is done away with entirely by means of right-angle cup-leathers, held in place by springs in such a manner that they are tight under all conditions. They allow the shaft to oscillate throughout any distance necessary, and are quickly renewable. Another most important point is that both suction and discharge are placed below the centre line of the pump, allowing removal of top without breaking water connections. Bearings are all of a self-oiled type. There are many other points of interest.

The City of Cobalt Mining Co. and the Temiskaming Mining Co., Ltd., have recently ordered air compressors for their properties in the Cobalt district, which represent a considerable step forward in the type of power machinery used in that camp.

These machines are of the Corliss tandem compound steam and two-stage air pattern, manufactured at Chicago by the Sullivan Machinery Company. Most of the air compressors now in service in the Northern Ontario district have been selected with a view to low first cost, since the mines have hitherto been in a stage of exploration, rather than of permanent production. These compressors, while performing well the purpose for which they were designed, have not been of a type economical in power consumption.

Fuel at Cobalt is expensive, owing to the long distance of the district from coal fields, and of the difficulty of hauling it from the railroad to the mines. The two Sullivan compressors just ordered are especially designed to secure a high degree of steam economy at a moderate first cost. with low expense for foundations and house-room.

PRESERVATION OF WIRE ROPE.

Where wire ropes are worked in places where they come in contact with acid water, or in hot and wet shafts, it is found that galvanized wire, of as large gauge is practicable, fills the requirements best. Before the ropes are used they should be coated thoroughly with a suitable lubricant applied hot. Cold lubricants are of little use. In the absence of lubricants the ropes rust out much more rapidly than they would wear out normally.

SPECIAL CORRESPONDENCE

Glace Bay, Oct. 19th, 1908.—The members of the P. W. A., who have left that body and joined the U. M. W. A., think they should have some share of the Defence Fund of the local organization, and they obtained an injunction restraining the Grand Officers of the P. W. A. from acting in that capacity until the claim of the U. M. W. A. faction is decided by the law courts. The case has been tried before Judge Graham at Sydney, who reserved his decision, and granted a continuance of the injunction until his decision is given. Somehow or other a political twist has been given to the internecine warfare between the unionists, and Mr. Justice Graham will very likely reserve his decision until after the election pother has subsided and reason resumes her sway.

The late strike of the C.P.R. employees has been an object lesson in the futility of strikes in Canada when engineered in the States. The sympathy of the Canadian public never will be with any body of workmen who strike at the dictation of international labor unions, and it cannot be gainsaid that public sympathy is the one and only force that will enable any labor union to win a strike. There have been very few strikes that have had less justification than the C. P. R. strike. It was deliberately called at the moment when it was most calculated to disorganize the carrying trade of the Dominion, with an utter disregard of public convenience. In direct consequence of this alienation of public sympathy, we believe, the strike failed in the most abject manner. The same abject failure, it may safely be prophesied, will attend any and every attempt to apply the methods of American trade unionism in Canada.

In our last letter we referred to the supreme importance of the St. Lawrence trade to the coal industry of Cape Breton, and to the very narrow margin by which this market is saved to Canadian operators. The people of Nova Scotia, if their would-be parliamentary representatives and their newspapers are any guide, do not realize these facts. Both political parties seem to be making a dead set at the coal trade. It is surprising how little some people recognize the hand that feeds them, and how lightly they discuss legislation on matters of which they are usually entirely ignorant. The representatives of one party wish to impose upon the coal trade an Eight Hour Bill, similar to that freak of class legislation shortly to occupy the attention of the House of Lords in England. The other party is blethering about Norwegian shipping in Canadian coastal waters, and the alleged extortionate price of coal. The newspapers who excite themselves over these Frankensteins of their own imagination usually refer to the coal operators as "barons." Exactly why nobody knows, but it sounds well, and all these papers have a penchant for a gentleman who was called Munchausen.

As to the selling price of coal. When it is considered that the miners of Cape Breton earn possibly as high wages as are paid to coal miners in any country, where the conditions of living approach the normal, and that coal is sold in Nova Scotia at a cheaper rate than in any European country, we fail to see where the extortion and injustice appear. The coal mines of Cape Breton are distant from Halifax almost twice as far as the mines of Derbyshire are from London, yet coal is cheaper in Halifax than in London.

The extortions of the coal "barons," which, according to the jeremaids of the newspapers, are wrung from the withers of the people, are so large that not a single coal company in Nova Scotia is really paying. The largest of them all, the Dominion Coal Company, has not paid one per cent. on its capital, reckoned from incorporation to date. Another large company has just passed its dividend, and one, at least, of the smaller companies is in the hands of the sheriff. But they have paid by far the largest portion of the provincial revenue, and they have supported at least one-quarter of the whole population of the Province. Even coal companies have their little uses.

The extraordinary attitude of one newspaper is well instanced by its conduct on two different occasions. Three men were killed at a Nova Scotian mine, directly through the negligence of a fellow-workman. This newspaper asked the Attorney-General to take steps to arrest the president of the company for manslaughter before he absconded! Another company, at very considerable expense, equips its mine with the latest appliances for saving life and property, and is able to render valuable assistance to a neighbor. This newspaper studiously avoids any mention of these facts. And this attitude is typical. Anything that can be raked up against the large coal operators is heralded abroad with colored headings, and anything that would tend to show a spark of saving grace is studiously suppressed.

Whole sheets are being written about the woes of schooner captains, whose distresses are stated to be entirely due to the growth of Norwegian shipping. All of this touching editorial solicitude for the poor schooner captain is so much politics. We can pass this phase, for it is evanescent.

What is the truth about Norwegian competition and the schooner trade? First of all, sailing vessels are out of date, and only exist to-day on sufferance. Steamers, large and small, are gradually ousting the schooner. The Norwegian vessels are up to date. These people have captured a large slice of the coastal trade, because they have been sufficiently enterprising and far-sighted to build just that particular type of boat that will give the quickest despatch and the lowest freighting costs. The Norwegian is a born sailor, and does not, even in these modern days, belie the Viking's blood. The mate of a Norwegian ship may look like the deckhand of a British tramp steamer, and he certainly works like one, but his conversation is that of an educated gentleman. It is said that the Norwegian sailor lives on food that any proper-minded British citizen would refuse. The writer recently sampled the menu of both an English and a Norwegian ship, and preferred the latter. The whole reason for the growth of Norwegian shipping is that the Norwegian captain knows his business, is a fearless navigator, and his ship is built to suit the trade in which it is to be engaged. All the Norwegian ships that sail Canadian waters were built, not in Norway, but in England. The cantilever patent on which many of them are constructed, is the property of a Tyneside firm. They pay fair dividends to the shareholders in Norway. But we cannot see how the exclusion of Norwegian vessels is going to help the schooner captain. It is a little late in the day to freight coal up the St. Lawrence in schooners, and if the Norwegians go, British bottoms will replace them. There are no Canadian ships capable of handling the coastal trade at the present time, and where it will advantage the country to force a shipbuilding industry by killing the coal industry, it is rather difficult to see. It is said that schooners cannot get cargo, because they are forestalled by the larger ships. There is a pier at Glace Bay which does nothing else but load schooners with coal all day long, and the Dominion Coal Company run an advertisement through the newspapers asking for schooners to load coal in any quantity.

A most interesting and valuable contribution has been made to industrial and sociological literature by a work, entitled "Diseases of Occupation," from the pen of Dr. Thomas Oliver, of Durham University. Dr. Oliver is well-known in connection with his labors for the British Home Office, and the present work deals thoroughly with every phase of industrial disease, from "a legislative, social and medical point of view," as the sub-title of the book states. The work is written so that it can be read and appreciated by those who are not medical men, but who happen to be associated with the industries that Dr. Oliver passes under review. Great interest centres around literature of this

kind in view of the present trend of legislation, particularly in respect to the various laws that propose the shortening of hours of labor and the compensation of industrial victims. Dr. Oliver deals squarely and impartially with both the responsibilities of the employer and the employed. A few extracts from Dr. Oliver's treatise may not be without interest to the readers of the Journal, as they relate to mining and miner's diseases.

Regarding the much-debated question of the general health of coal miners Dr. Oliver says: "Of all occupations, none is more hereditary than that of coal mining. A lad goes into the mine because his father is working there and his grandfather did so before him. Miners are, therefore, not a selected class of men. Although a large part of the day is spent underground, the occupation of the miner is not an unhealthy one. . . . When pulmonary tuberculosis is caught by a miner, it is much more likely that the infection has been caught in the home or public-house than in the pit, where the ventilation is ramarkably free and the air supplied particularly pure and abundant. Better housing, the provision of purer drinking water, better food, good wages, greater railway facilities, and the establishment of reading and recreation rooms have done much to improve the health of the mining classes, and to raise their tone socially and morally."

On the question of whether coal-dust is or is not antiseptic the book goes on to say: "Experimental results, also surgical experience of miners' accidents, have suggested that coal-dust possesses a distinctly germicidal action, but when this has been tested on various forms of micro-organisms, including tubercle bacilli, no such germicidal action has been found." Dr. Oliver is of the opinion that the improved health of the miner and his comparative freedom from pulmonary tuberculosis are due to the better ventilation of the coal mines, the air of which, as it passes onwards through the mine, "becomes rid of bacteria and reaches the miner at his work in a purer state than the air we breathe in the streets of a large town."

Some of the miners' diseases to which the treatise refers are more particularly incidental to longwall and hand pick mining in thin seams, where the constrained and unnatural position of the miner induce such conditions as "beat knee," and "miners' nystagmus." The introduction of machinery, such as coal-cutters and longwall conveyors, is likely to render many of these conditions less frequent in the coal seams of the Old World, and on this side the water we have not yet got down to the working of the thinner seams.

Dr. Oliver refers to the unpleasant consequences that may follow the neglect of purulent opthalmia, or trachoma, in mining districts, and speaks of the spread of the disease to the wives and families of miners in Westphalia. Referring to the possibility of the introduction of this disease into Britain, Dr. Oliver says it can only arise "through alien immigrants bringing it." It is a matter of congratulation that the Canadian authorities are rigorous in this matter, but nevertheless we have reason to know that there are many cases of this disease amongst the mining populations of this country

Judging from Dr. Oliver's description the conditions of the gold workers in the Rand shows more need for improvement than any other set of mining conditions that exist in the Empire. It would be hard to imagine a worse state of affairs than have existed in South Africa, and although some improvement is taking place it is very slow.

A very complete chapter is devoted to amkylostomiasis, in which we are glad to find Dr. Oliver believes that solutions of common salt are of great value in preventing the development of the ova of the parasite to the larval stage. In most of the Cape Breton mines that underlie the sea there is present mine water of a more or less saline nature. Dr. Oliver states that the points which have struck him in regard to ankylostomiasis are: "The silent march of the disease from mine to mine and from one mining centre to another, the long latent period of its incubation, the suddenness of its outbursts, and the extreme virulence of the endemic when it first appears compared with what it is later on."

The last chapter in the book is devoted to the consideration of rescue work in mines. Dr. Oliver lays stress upon the fact that by far the greater number of victims in mine explosions die from carbon monoxide poisoning, and not from the shattering and burning effects of the explosion. He reviews the various forms of rescue apparatus now on the market, and closes with the remark that any doubts as to the utility of rescue apparatus should be removed in view of the following: "On September 14th, 1907, an explosion occurred in the Saar and Mosel Colliery at Merlbach, in the Prussian Saar district. A rescue party of 12 men, equipped with the Draeger apparatus, descended, and after working for an hour, brought to the surface the eight survivors and the bodies of four men who had been killed by the explosion." Dr. Oliver also remarks that the subject is one to which medical men engaged in colliery practice should give attention.

On the subject of intemperance Dr. Oliver does not mince his words. To quote: "There is nothing that induces to certain forms of industrial poisoning, or is more likely to become a source of accident to a workman than indulgence in alcohol . . . to this cause may be traced many of the accidents that happen in docks and wharves, and to it, also, probably some of the shipwrecks that have taken place shortly after vessels have put to sea. . . . It is not improbable that many of the unexplained falls of men, which may result in serious injury to life and limb, may be the result of ill-nourished, poisoned conditions of the nervous system, not the outcome of an immediate debauch, but of the long continued indulgence in alcohol. If we add to alcohol the infection of syphilis we have in these a combination of circumstances, the influence of which, from a medico-legal point of view, is far-reaching, so far as workmen's compensation is concerned."

It is a pleasant feature of this work that many of the diseases which Dr. Oliver has to refer to have been mitigated by improved conditions and industrial legislation. There are still many crying evils connected with child and female labor that require removing, both in America and in Europe, but on the whole, the book is one that makes for optimism, and is a strong plea for mutual consideration between capital and labor.

Diseases of Occupation, from the Legislative, Social and Medical Points of View. By Thomas Oliver, M.D., F.R.C.P. Methven & Co., London. Price, 10s. 6d.

ONTARIO.

Cobalt.

The Leasing System of Cobalt.—The Leasing System, which is rapidly gaining favor in the camp, will do much to solve the problem of the development of the large area in the proven district held by individuals or campanies without funds to run their properties.

This system, which is universal in Western camps, was introduced in Cobalt by the Peterson Lake Mining Company, which now has a number of 10x20 acre plots leased to various companies and syndicates.

The Nova Scotia Company are now taking high grade ore from a plot leased to them by the Peterson Lake Company. The Little Nipissing is working a very promising lease situated on the east shore of the lake. Segsworth & Jackman, The Kerry Mining Company, The Gould Syndicate, and The Bridge Syndicate are all operating properties leased from the Peterson Lake Company.

A syndicate of Montreal capitalists, represented in Cobalt by A. M. Bilsky, have secured a number of important leases, and are negotiating for others.

Two twenty-acre lots north of and adjoining the Shamrock, Badger and Fisher-Eplett, owned by the Davis Silver Cobalt Mines Company, have been leased to this syndicate, which also has leased the Silver Mountain and Silver Nugget properties.

Mr. L. D. Madden, who has been a strong advocate of this method of development, in addition to arranging the Little Nipissing lease, has secured a ten-year lease from the Coleman Cobalt Company of a forty-acre plot, which adjoins the Nipissing Silver Leaf and White Silver, upon which he has already made a very promising discovery. Mr. H. P. Davis, in conjunction with one of the members of the syndicate which controls the Davis Silver Cobalt Mining Company, has taken a lease on Lot 5 of this company, and is working a large force of men. Mr. Davis is also negotiating leases in two additional properties belonging to the same company. The majority of these leases are for five years, with a royalty of 25 per cent. of the net smelter returns.

Nova Scotia.—After many months of development work carried on under more or less discouraging circumstances the Nova Scotia Mine is in a very favorable condition for steady shipments of very rich ore.

While many pockets of high grade ore were located in the 1,800 to 2,000 feet of underground work, no permanent ore bodies were located until this spring. The present position of this mine, as one of the big shippers is due to the efficient management and the continued faith of the directors in the property.

In the early part of this year in a cross-cut at the 100-foot level, vein No. 3, a very wide body of high-grade ore was encountered. A drift 200 feet in length, extending into the 30-acre tract, leased by this company from the Peterson Lake Mining Company, has developed a continuous ore body from 5 to 15 feet in width in which the values occur as leaf silver shot through the ore chute. A winze sunk on this chute proves the continuance of the values to this depth, and there should be 50 feet of good stoping ground above the 100-foot level. 100-foot level.

The last report of Mr. Benj. B. Lawrence, consulting engineer for the Nova Scotia Company, gives a concise and clear statement of the physical condition of the property, which should inspire the confidence of the stockholders in the management and the future of the mine.

Approximately $75,000 has been invested in surface plant and buildings, with the result that this property is one of the best equipped in the district. A comprehensive system of handling and traetment of the ore has been worked out, and from present indications, this mine should soon rate as one of the important shippers of the camp.

Northern Customs Concentrator.—Under the efficient management of Mr. F. J. Bourne, the Northern Customs Concentrator, is successfully handling on an average of 85 tons of low grade ore per day.

Over 4,500 tons of ore from the dumps of the Silver Queen, Townsite, City of Cobalt Mines have been treated since July, when operations were started. The mill runs 24 hours per day and only five and one-half hours have been lost in this time.

A self-dumping skip carries ore to a No. 4 Gates gyratory crusher, which reduces the rock to 1½-inch mesh, from the crusher it goes to a pair of 16" x 24" rolls, and is crushed to a ¾ inch size, elevated to a 36 by 60-inch trommel, and then separated; the over size is treated on a 24 x 30 Bull Jig, the tailings being sent to a battery of twenty 1,250-pound stamps, which reduce the materials to a pulp.

The pulp is taken to two Richard Classifiers, the coarse material going to Wilfley tables, and the overflow to callow settling tanks. The material from these tanks is treated on 5 by 6 Frue Vanners.

The rock handled by this mill is chiefly the dumps from the various mines, which have contracts with the Northern Concentrator Company, and averages 30 ounces of silver to the ton.

The recovery is approximately 84 per cent. Ore as low as 10 ounces to the ton can be handled at a profit.

Mr. Bourne is now installing an amalgamating and cyaniding process to save the small percentage of silver which is lost in the mill.

The mill is saving a large percentage of the argentite and pyrargrite by taking it out as a hutch product on the jig. This is re-treated in Keivies, or half barrels, and brought up to about 1,100 ounces silver. The losses in argentine and pyrargyrite are largely due to slimes. By treating in Keivies the losses due to attrition in jigs is avoided.

Cobalt Central.—On October 22nd a diamond drill which has been operating for some days at the Cobalt Central property, located at the two hundred-foot level a two-foot vein of calcite, smaltite and silver, which assays about six hundred ounces. A cross-cut will be run from the main drift at the lower level to cut this vein.

Chambers Ferland.—The "Right of Way," "La Rose" vein, was located on the Chambers Ferland property on October 20th, in a cross-cut from the "Right of Way" drift. This cross-cut was run at the expense of the Chambers Ferland Company to locate this vein on their property. The ore, were encountered, was forty-five inches wide and was very rich in silver.

Montreal River.—A contract has been let and work begun on a road from Elk City to Miller Lake. This road will be twenty-five miles in length and wil open up the Miller Lake, Lost Lake and Gowganda Districts.

Queen Alexandra.—A contract has been let to sink a shaft fifty feet deep on the Queen Alexandra property on the north shore of Cross Lake.

Coniagas.—The regular quarterly dividend of 3 per cent. will be paid November 2nd to shareholders of record of October 20th.

Little Nipissing.—At the annual meeting of the Little Nipissing Mining Company, held in Toronto, October 16th, it was unanimously agreed to increase the capitalization of the company from $650,000 to $1,000,000. The 350,000 shares were underwritten by the shareholders.

The report of Superintendent Madden, who has had charge of the development of the various properties of the company, was most encouraging.

The recent discovery of a 12-inch vein of decomposed calcite and cobalite near the north boundary line of J. B. 2, the orinal property of the Little Nipissing Company, is very promising, and has very good prospects of proving up shipping values.

Silver Leaf.—At a meeting of the directors of the Silver Leaf Mining Company in Toronto, October 17th, it was agreed to cancel the lease under which Mr. H. D. Symmes has been operating the property for the past year. The lase expires on October 21st, and after that date the property will be under the management of Mr. George Leyson, formerly superintendent of the Silver Queen.

Mr. Leyson will take charge under very much more favorable circumstances than confronted Mr. Symmes a year ago.

The company now has nearly $100,000 in the treasury, and ore in sight in the No. 5 vein, upon which a shaft has been sunk to the depth of 215 feet.

Temiskaming Cobalt (Warner Property).—A syndicate of Chicago people has purchased the Warner or Temiskaming Cobalt property on the shore of Lake Temiskaming, south of Haileybury.

Several shipments of ore, which run very high in cobalt, have been made from this property. A shaft has been sunk 125 feet on a big vein of cobalt. A new plant, consisting of a 12 inch drill compresser, boilers, etc., will be installed at once.

Cochrane Cobalt.—Under the direction of Mr. Floyd Harmon, operations have commenced on the Cochrane Cobalt property, south of the Temiskaming.

Columbus Cobalt.—A contract has been let to sink the main shaft on the Columbus Cobalt an additional 50 feet to the 200-foot level.

Leases.—Lots No. 388 and 389 an dthe Station Grounds at Cobalt, a total of 16 acres, have been leased from the T. & N. O. R. R. by A. Rosenthal and G. B. Dickson, of Ottawa.

The Davis Silver Cobalt Mines Co. have leased a twenty ore lot, south of Cross Lake, to a Montreal syndicate.

BRITISH COLUMBIA.

Phoenix.

Former Manager P. F. Roosa, of the Dominion Copper Co., has been appointed provisional liquidator for the purpose of winding up the affairs of that concern. It is regrettable that this company found it impossible to raise the money to pay the $80,000 that was due the bondholders for interest and payment toward the sinking fund, but it is conceded that the company would have, at best, worked along in a half-hearted way as long as copper remained at its present low figure, and, perhaps, after going through the fire of reorganization the affairs of the company will be in a more pure condition, and their finances will be placed on a firmer basis. The mines of the Dominion Copper Co. are looking well, and they had got their mining and smeltnig costs down to a lower figure lately than they have hitherto been able to do. It is true that there are a few facilities that might be installed at the mines and smelter, and which would materially reduce the cost of mining and smelting, but the management had long recognized this and these appliances would now be installed if they had ben able to find the money to do the work. A greater part of the equipment is up-to-date, such as air-compressors, drills, larger furnaces at the smelter, etc. No doubt when the present difficulties have been arranged the company will resume work with the prices of metals ascending, and as they will, no doubt, get a substantial start, the company should rapidly arive at a profit-paying stage and rank with the other dividend paying low-grade copper mines now working in the Boundary district If it is possible those interested are going to resume work within the next few weeks, but it is hardly likely that they will get matters in proper form in sueh a short space of time Some of the men have not been paid their wages yet, having only received time checks for fheir time; the principal issue at this moment is to get these men paid up. A small crew has been retained around the mines and smelter, to keep the mines unwatered, etc.

The unsettled condition of Dominion Copper affairs has, to a more or less extent, affected all of the mining interests of this district, which is only natural, and the result can be seen in the ore shipment during the past four weeks, which have shown a steady decline in tonnage, with the exception of the last week, ending October 17th, when the increase of 2,501 tons over the preceding week is recorded. The total tonnage for that week being 30,301 tons. Shipments from the Mother Lode, and particularly from the Oro Denoro, have been somewhat arratic during the last few weeks. Shipments from the Snowshoe have been steady, and during the week ending October 10th ran up to 2,730 tons.

The management of the Jewel mine have got the new site for the stamp mill cleared, and the ground is ready for the foundation of the building. There is a large tonnage of concentrating ore in the Jewel mine, but it is of a recalcitrant character. However, after a number of tests the company is satisfied the method they will employ in the new mill will be a success.

The bond until recently held by Hedley mining men on the Golden Zone has been thrown up, and it is stated that the deal will not be put through. From lack of water the recently installed stamp mill is now inoperative.

The Granby report is to hand, and shows that their profits for the fiscal year, ending June 30th, 1908, were $354,424 on a gross earning of $3,790,184. This company realized an average price of 13 1-3c. per lb. on fine copper during the year, while the net cost per pound, after deducting values of gold and silver, was $131. It is shown that the average extraction per ton of ore was 23.42 lb. copper, .2865 oz. silver and .0454 oz. gold.

A force of eight men has been put to work on the recently acquired B. C. Copper property in Wellington camp The 35-ft. shaft is all in ore, and is looking richer with ever shot fired, all of which must be very gratifying to both the bondholders and the bondors.

A new land of high grade ore has been cut in the workings of the Sally mine.

Rossland.

The report of the Consolidated Mining and Smelting Co. of Canada, Limited, has been published here, and is regarded as a good report for a year into which so much trouble was crowded as that which the report covers. Naturally, if the metal market had not gone to pieces last year the Consolidated Co. would have made nearly $400,000 more in selling the large quantity of custom ore and ore from their own mines that they had on hand at that time. As it was the profits on the year's operations were $43,415.93. This concern paid $66,940 in dividends during the year, and wrote off a large amount for depreciation of plant, stores, equipment and doubtful bills. It is pleasing to note that operations at the Trail smelter and lead refinery were increased 45 per cent. during the year, the value of the output being $5,425,501, as against $3,786,146 for the year 1907. According to the report (and according to local reports) the mines have large reserves of ore, development work is in good condition and the future looks bright.

The lessees of the Evening Star have uncovered a new ledge from which they aer shipping some rich ore. Assays recently taken show values of $28 to $50 per ton. The lessees shipped a 35-ton car during the week ending October 10th.

The lessees of the Nest Egg got a car of select ore off to the smelter during the last week, placing that mine on the shipping list for the first time this year.

Active work is going on at the Centre Star, Le Roi, Le Roi 2, Limited, Giant-California, and many of the smaller properties, and the situation here presents a very stable appearance.

Nelson.

At the Spokane Interstate Exposition, October 5th to October 10th, the Nelson Board of Trade, competing with Montana, Idaho and Washington was successful in taking the $100 trophy cup for a general ore display. Nelsonians generally feel proud of this achievement, but there were other sections of British Columbia honored with cups and some with diplomas. The following were granted cups for their ore displays: Similkameen, Columbia Copper Mining Co.; Kamloops, Iron Mask mine; Boundary, Ore Denore of B. C. Copper Co.; Rossland, Centre Star mine; Nelson, Queen Victoria mine; Ainsworth, Krao mine; Kalso-Slocan, B. C. Standard; one cup being awarded each display deserving of this honor in any one section. Montana, Idaho and Washington mines also competed in this class and carried off nine of the sixteen that were to be alloted. The following British Columbia mines were awarded diplomas: Lucky Strike, Kamloops; Evening Star, Kamloops; Roach River group, Similkameen; Elkhorn, Boundary; Arlington, Nelson; Granite-Poorman, Nelson; Blue Bird, Kaslo-Slocan; Blue Bell, Ainsworth; Broadview and Mammoth, Camborne, from which it will be seen that our mines also took ten of the 22 diplomas that were awarded.

The talk of the Slocan is the strike that the Italian lessees of the Reco have made. They have more ore than they can conveniently handle with existing facilities. These fortunate men have been offered $25,000 for their lease, but refused to sell. A couple of strikes of this character and Sandon will take on some of its old-time liveliness.

GENERAL MINING NEWS.

NOVA SCOTIA.

Halifax.—The Waverley plant of the Acadia Powder Company has been purchased by the Nobels. This is a significant step, and, no doubt, indicates an expansion of the industry.

Halifax.—Three new gold-mining enterprises will be launched this autumn, and three abandoned mines will be put in commission.

Amherst.—The new bankhead of the Maritime Coal, Railway and Power Company has a capacity of 1,500 tons per day. It is equipped with revolving tipples, automatic quick-weighing hoppers, etc.

ONTARIO.

Cobalt.—The results of the tenders for the four parcels of Cobalt land were announced on October 15th by the T. & N. O. Railway Commissioners. Messrs. A. Rosenthal and G. P. Dickson, of Ottawa, have secured parcels one and five, comprising sixteen acres at the Cobalt station grounds, and lots 388 and 389 of the townsite. The price paid for this was $30,200. The other two parcels, comprising about four acress of lot 44 in the town and lot 338 were secured by Messrs. W. L. Hayden and Raymond Mancha, of Detroit, for $5,575. There is a royalty of 25 per cent. on the gross output of the properties. The payments were made on a 999 years' lease.

The Floyd mine (so-called), a mere prospect, is being manipulated in Montreal. Those who think that this is a mine should come up to Cobalt and have a look for themselves.

Larder Lake.—The projected sale of the Harris-Maxwell gold mine is not yet completed. A month's test run in the stamp-mill is to be made.

Cobalt.—It is reported that a compromise has been effected between the Ontario Government and the Temiskaming and Hudson Bay Mining Company. The T. & H. B. receives patents for the property under dispute, and the Government is to be paid 15 per cent. of all smelter receipts.

The Nova Scotia mine has done about 5,000 feet of drifting, along with 2,500 feet of cross-cutting since it was opend.

Bruce Mines.—The Bruce copper mine was sold at auction early in October. The highest bidder was Mr. R. W. Leonard, of St. Catharines. Mr. Leonard's bid was $50,100. Associated with Mr. Leonard is Mr. Alexander Longwell. The Bruce mine has ample low grade ore reserves. The question of concentration has hitherto been a leading difficulty.

BRITISH COLUMBIA.

Phoenix.—P. F. Roosa, local manager of the Dominion Copper Company, has been appointed receiver. The appointment was made on the application of the National Trust Company of Toronto.

Hazelton.—Five miles below Telkwa, on the Berkley River, a four-foot seam of clean coking coal was found some weeks ago. Another seam, 8 feet thick, was discovered 1,000 feet above the first one.

Grand Forks.—No. 1 Furnace of the Granby Consolidated has been put in blast. It has been enlarged and is now four feet larger and four feet deeper than any of its companion furnaces. This change in construction is experimental. If No. 1 proves successful the other furnaces will be similarly enlarged.

Kamloops.—At the Interstate Fair at Spokane the mineral exhibit from Kamloops was one of the striking features. The specimens from the Iron Mask mine won a prize in Class 2. The prize consisted of a silver cup. A similar prize in Class 1 was awarded the display from Nelson. Other B. C. camps and mines won distinction.

Victoria.—The C. P. R. freight steamer, "Princess Ena," is carrying about 1,300 tons of copper over from Sidney Inlet mines to the Tyee Copper Company's smelter. The Tyee people have leased the Sidney Inlet mines.

MINING NEWS OF THE WORLD.

GREAT BRITAIN.

Several strikes of coal miners in the South Wales coal field are reported over the questions of wage reduction, and the employment of non-unionists, and a large number of miners are out of work.

The amounts awarded for compensation under the Workmen's Compensation Act, in connection with the recent disaster at the Maypole pit, Abram, in which 75 lives were lost, will amount to a total of between £14,000 and £15,000.

A syndicate has been found for the proposed of quarrying the columnar basalt on the north coast of Antrim, Ireland, between Ballycastle and Portrush.

GERMANY.

It is reported that a large new colliery will shortly be established by Messrs. Krupp, of Essen, at Neuenkirchen, Westphalia.

The Gelsenkirchen Company propose to erect six blast furnaces and an extensive steel works, etc., at a cost of 40-000,000 marks at Roth Erda.

The death of Mr. Alexander Hilbek, one of the leading authorities on mining matters in the Rhenish-Westphalian coal field, is announced.

The Rhenish Boring Co. will immediately commence the development of 15 coal concessions on the left bank of the Rhine on the Dutch frontier.

ALGERIA.

The Ain-Arko zinc deposits, which were first worked in 1873, but subsequently abandoned, were reopened in 1904, and there is now a certainty of a large output from existing workings and good promise as regards other prospects.

SOUTH AFRICA.

The Simmer Deep mine, on the Rand, is now operated by power purchased from the Victoria Falls Power Co., which is a new departure involving the supply of electric energy from central stations on the Rand. Competition in the supplying of power for operating mines is anticipated.

The diamond-cutting and polishing industry has been started at Johannesburg on a small scale with a few experienced workers. It is intended to extend it as soon as the business has been fairly established, and to train young men in the art.

More white labor is being employed in tre gold mines, the engagement of previously unskilled whites to take the place of natives having proved more successful latterly than at first. One result has been a diminution in gold thefts.

CUBA.

The gold mining industry is coming into prominence. The Holguin-Santiago Mine Co. has recently made large shipments, and has acquired new claims which show excellent prospects. Other enterprises are being undertaken in the Province of Santiago, where gold was formerly produced in paying quantities.

UNITED STATES.

It is estimated that the gold production of Rawhide, Nev., during the first year of the existence of the camp, will amount in value to about one million dollars.

The Iron River district of the Menominee Range, Mich., bids fair to prove an important source of iron ore supply. A number of new mines are in course of development and others are being opened.

The Philadelphia & Reading Coal and Iron Co. is installing rescue apparatus of the helmet type at all its collieries. The device is equipped with a tank of oxygen to last the wearer for two hours.

The Tintic Smelting Co., Utah, has closed down its plant for some weeks.

MEXICO.

A new holding company is reported in process of organization to take over the assets of the Greene Gold and Silver Co. and the Sierra Madre Land and Lumber Company, the bankruptcy of which was a serious blow to the industries of the State of Chihuahua. The Greene interests will not remain in control.

Progress in the mining industry in the State of Oaxaca is being indicated by the erection at several points of modern reduction works.

COMPANY NOTES.

The report presented at the annual general meeting of the Granby Consolidated Mining, Smelting and Power Company, Limited, held in New York in the former part of October, for the year ending June 30 last, shows that during the past year the big Boundary company made a profit of $354,424. The official figures are as follows:—

Pounds of copper	21,126,926
Ounces of silver	300,593
Ounces of gold	40,139
Gross earnings	$3,790,184
Charges, etc.	3,435,760
Net profit	354,424
Dividends	675,000
Deficit	$320,576
Previous surplus	2,775,757
Profit and loss surplus	$2,455,181

The charges as above include the following items: Making expenses at mines and smelter, freight, refining, selling and general expenses, $3,013,395; foreign ore purchased, $170,266; bonus to employees, $23,100; and allowing for depreciation, $228,999.

Crediting surplus after charges, etc., $354,424, with the $228,999 charged out for depreciation, the amount earned on the stock for the year was $583,423, or $4.32 per cent. on the $13,500,000 outstanding.

The general balance sheet for the year shows as follows:—

Assets.

Cost of land, real estate, machinery, buildings, dwellings and equipment	$15,238,437
Stocks, bonds, and bills receivable	1,008,012
Fuel and store supplies	185,324
Cash and copper	421,625
Total	$16,853,399

Liabilities.

Capital stock issued	$13,500,000
Dividends collected on liquidated shares	1,323
Accounts and bills payable	896,895
Surplus	2,455,181
Total	$16,853,399

The price realized on fine copper was on an average 13 1-3 cents per pound, and an average for gold of $20 per ounce.

The net cost of copper per pound, after deucting the gold and silver values, was 10.31 cents.

The address of President Longcloth in part runs thus: The mechanical devices now in operation, such as shafts, hoists, belt conveyers, mine cars and electric locomotives, are able to handle about 5,000 tons of ore daily. The mines shipped to the smelter during the past year a total of 858,432 tons, as against 644,549 tons during the previous year. The grade of ore mined was not as good as in the previous year, carrying about one pound less of copper and from 10 to 12 cents less per ton of ore in gold and silver.

The extraction per ton o fore on the average was 23,42 pounds copper, .2865 ounces silver, and .0503 ounces of gold during the previous year. During the summer months a lower grade ore was shipped, due to mining the glory holes on the surface, which are low-grade and which cannot be mined during the winter months. Consequently the ores will average richer in winter and spring and poorer in summer and fall. The quantity of ore developed by diamond drilling has been greater than the ore extracted.

The total tonnage of Granby and foreign ore amounted to 882,611 dry tons, as compared with 665,915 in the previous year, and there was produced 21,120,926 pounds of copper as against 16,403,497 pounds during 1906-1907.

The cost per pound of copper produced, after deucting the gold and silver values, was $0.1024 as against $0.1014 in the previous year.

Almost immediately after issuing our last annual report a most severe panic broke out, and among other disastrous consequences the consumption of all metals decreased materially, and prices showed a heavy decline. Prices fell off from about 25 cents to close to 12 cents, and showed little recovery during the first six months of the present year, due to the great falling off in the consumptive demand for home trade. Fortunately, Europe was a continuous buyer, thereby preventing large accumulations of stock. Of late the demand for home trade has shown great improvement, and if this continues, as appears to be the case, it may be confidently hoped that prices will show a further improvement.

The enormous decline in the price of copper and the marked influence on the cost by reason of the difficulties with which the smelter had to contend, permitted the declaring of only two dividends, namely: One of three per cent. on September 30, 1907, and one of two per cent. on June 30, 1908.

ANNUAL MEETING OF THE CITY OF COBALT MINING COMPANY.

The annual shareholders' meeting of the City of Cobalt Hining Company was held on the evening of October 9th. Mr. R.

T. Shillington, M.L.A., was elected president, Mr. H. H. Long vice-president, and Mr. W. H. Powell second vice-president. Mr. B. W. Leyson, of the Townsite Mining Company, was appointed mining superintendent, and the position of manager was abolished. The following statement of liabilities and assets was accepted:—

Liabilities.

Capital stock of the company		$500,000 00
Outstanding accounts		7,924 19
Royalty due T. & N. O. Ry. Commission		40,000 00
Pay list, September, men	$6,603 92	
Pay list, September, office	425 00	
		7,038 92
To balance		1,162,818 38
		$1,717,781 49

Assets.

Office furniture, etc.		$600 00
Tool account		1,900 52
Buildings		6,772 03
Real estate		16,695 69
Plant account		14,272 04
Treasury stock not issued		48,783 00
Estimated value of mine as at present developed		1,500,000 00
Value of ore not shipped		13,000 00
Ore shipped to smelters and not yet accounted for, estimated		69,850 00
Cash on hand	$49 50	
Balance in bank	45,858 71	
		45,908 21
		$1,717,781 49
By balance		$1,162,818 38

STATISTICS AND RETURNS.

NOVA SCOTIA STEEL.

The coal shipments of the Nova Scotia Steel Company for the past nine months show an increase of 15,779 tons, as follows:—

Shipments September, 1908	56,367
Shipments September, 1907	60,355
Decrease September, 1908	3,988
Shipments 9 months, 1908	481,011
Shipments 9 months, 1907	465,232
Increase 9 months, 1908	15,779

Coal shipments from the collieries of the Cumberland Railway and Coal Company, Springfield, N.S., for September, amounted to 29,442 tons.

INTERCOLONIAL COAL CO.

Shipments, September, 1908	20,628
Shipments, September, 1907	21,003
Decrease, September, 1908	375
Shipments, nine months, 1908	191,992
Shipments, nine months, 1907	202,574
Decrease, nine months, 1908	10,582

INVERNESS RAILWAY & COAL CO.

Shipments, August, 1908	20,487
Shipments, August, 1907	22,422
Decrease, August, 1908	1,935
Shipments, nine months, 1908	192,730
Shipments, nine months, 1907	176,572
Increase, nine months, 1908	16,158

ACADIA COAL CO.

Shipments, September, 1908	25,133
Shipments, September, 1907	28,198
Decrease, September, 1908	3,065
Shipments, nine months, 1908	239,081
Shipments, nine months, 1907	230,243
Increase, nine months, 1908	8,838

CROW'S NEST PASS COAL CO.'S OUTPUT.

Coal production—First nine months, 1908	742,224 tons.
Coke production—First nine months, 1908	195,107 "
Coal production—First nine months, 1907	701,527 "
Coke production—First nine months, 1907	162,459 "
Output of coal, week ending October 16	19,202 "
Being a daily average of	3,200 "

Reports to the Provincial Bureau of Mines for the six months ending June 30 show that the metalliferous mines and works in the Province produced over eight million dollars worth of ore. The classification is as follows: Arsenic, 256 tons, value $1,573; cobalt, 365 tons, value $39,822; gold, 1,524 ounces, value $27,672; silver, 7,746,537 ounces, value $3,888,991; copper, 3,887 tons, value $547,417; nickel, 4,779 tons, value $932,828; iron ore, 84,440 tons, value $214,284; iron pyrites, 8,728 tons, value $27,968; pig iron, 148,365 tons, value $2,401,709. The total value is $8,083,264.

Following are the figures of German consumption of foreign copper for the months of January and August, 1908:

Imports of copper	107,387 tons.
Exports of copper	5,442 "
Consumption of copper	101,945 "

As compared with consumption during the same period in 1907 of 78,409 tons. Of this quantity 99,211 tons were imported from the United States. Reported by L. Voleglstein / Co., New York.

COBALT ORE SHIPMENTS.

Following are the weekly shipments from Cobalt camp, and those from January 1st to date:

	Week end. Oct. 10. Ore in lbs.	Since Jan. 1. Ore in lbs.
*Cobalt Central	40,500	443,475
Kerr Lake	80,000	846,174
La Rose	120,000	6,490,640
Nipissing	260,200	4,800,697
O'Brien	191,260	5,463,647
Temiskaming	60,000	868,620
T. & H. B.	180,000	1,648,500

*Concentrates.

BRITISH COLUMBIA ORE SHIPMENTS.

Nelson, B.C., Oct. 10.—The total shipments for the week were 34,332 tons, and for the year to date 1,359,186 tons. The

weekly shipments show a considerable falling off, as far as the totals are concerned. This is due to repair and extension work going on at the Granby Smelter, the output from those works being less than two-thirds of the capacity of the plant. On the other hand, the Trail Smelter, through the operation of its new furnace, handled more ore last week than at any time during its history, 9,220 tons. Several properties have recommenced shipping in each one of the principal divisions of the district.

COBALT ORE SHIPMENTS.

Following are the weekly shipments from Cobalt camp, and those from January to date:

	Week end. Oct. 17. Ore in lbs.	Since Jan. 1. Ore in lbs.
Buffalo	.....	912,950
**Coniagas	.....	969,360
Cobalt Lake	.....	341,683
*Crown Reserve	.....	242,000
Cobalt Central	.....	443,475
Chambers-Ferland	.....	183,450
City of Cobalt	.....	1,197,220
Drummond	.....	1,065,620
Foster	.....	297,300
Kerr Lake	61,170	907,344
King Edward	.....	127,240
La Rose	120,000	6,610,640
McKinley-Daragh	178,000	2,517,770
Nipissing	185,200	2,564,970
Nova Scotia	.....	392,275
Little Nipissing	.....	40,110
Nancy Helen	.....	367,427
O'Brien	.....	5,463,647
Peterson Lake	.....	41,231
Right of Way	123,100	1,156,780
Provincial	.....	143,210
Silver Leaf	.....	258,030
Silver Cliff	.....	52 000
Silver Queen	.....	1,555,990
Townsite	.....	251,700
Temiskaming	.....	868,620
T. & H. B.	180,000	1,828,506
Trethewey	.....	1,910,476
Watts	.....	561,680

*Concentrates. **Concentrates and high-grade ore.

The total shipments for the week were 967,470 pounds, or 483 tons.

BRITISH COLUMBIA ORE SHIPMENTS.

Nelson, B.C., Oct. 17.—The shipments for the week ending October 17 show considerable activity in mining over all the districts, several new shippers being added to the list. The total for the week is above the average for the year, but not nearly as much as the capacity of the smelters warrant. The Trail smelter is treating more ore than at any time during its history, and its receipts for the week establish a new record for the consolidated company.

The following are the ore shipments for the past week and year to date:—

BOUNDARY SHIPMENTS.

	Week.	Year.
Granby	18,069	820,844
Mother Lode	8,772	189,736
Oro Denoro	900	51,006
Snowshoe	3,491	14,339
Phoenix Amalgamated	56	85
Other mines	.....	22,248
Total	31,288	1,098,262

ROSSLAND SHIPMENTS.

Centre Star	4,023	134,996
Le Roi	1,685	62,483
Le Roi No. 2	530	23,550
Other mines	.....	982
Total	6,238	222,011

SLOCAN-KOOTENAY SHIPMENTS.

St. Eugene	726	19,643
Whitewater	45	1,471
Whitewater, milled	280	12,620
Poorman, milled	250	8,800
Queen, milled	400	7,790
North Star	69	3,364
Richmond	69	1,870
Arlington, Erie	24	1,870
Standard	42	1,102
Rambler-Cariboo	38	968
Silver Cup	51	742
Idaho	98	634
Ruth	21	618
Slocan Star	31	315
Hewitt	33	314
Maestro	89	89
Canadian Group	17	39
Rio	15	15
Black Diamond	6	6
Other mines	.....	17,019
Total	2,208	78,611

The total shipments for the week were 39,734 tons, and for the year to date 1,398,884 tons.

MARKET REPORTS.

Oct. 23.—Connellsville coke, f.o.b., ovens:—
Furnace coke, prompt, $1.40 to $1.50.
Foundry coke, prompt, $2.00.

Metals.

Oct. 23.—Tin, Straits, 29.45 cents.
Copper, prime Lake, 13.70 to 14.75 cents.
Lake arsenical brands, 13.60 to 13.70 cents.
Electrolytic copper, 13.50 to 13.60 cents.
Copper wire, 14.75 cents.
Lead, 4.25 cents.
Spelter, 4.825 cents.
Sheet zinc, 7.50 cents.
Antimony, Cooksoon's, 7.125 cents.
Aluminium, 25 cents.
Nickel, 40 to 47 cents.
Platinum, $21 to $23.50 per ounce.
Bismuth, $1.75 per lb.
Quicksilver, $46 per 75-lb. flask.

Silver Prices.

	New York. cents.	London. pence.
October 10	51 5-8	23 13-16
" 12	51 5-8	23 13-16
" 13	51 5-8	23 13-16
" 14	51 5-8	23 13-16
" 15	51 3-8	23 11-16
" 16	51 1-2	23 3-4
" 17	51 3-4	23 7-8
" 19	52	24
" 20	51 1-2	23 3-4
" 21	51 3-8	23 11-16
" 22	51 1-2	23 3-4
" 23	51 3-8	23 11-16