# THE CANADIAN MINING JOURNAL

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## The Canadian Mining Journal

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## FIRE LOSS AND MINERAL PRODUCTS.

We have read no more eloquent plea for the use of mineral products—and we use this term in its widest sense—in the construction of buildings than that contained in a bulletin just issued by the United States Geological Survey.

Investigations made by officials of the Survey have adduced many startling facts. For instance, the fire loss in the United States during 1907, excluding forest fires and marine losses, was more than $456,485,000. The actual fire losses due to buildings and their contents destroyed meant a per capita loss of $2.51. In Europe, due largely to the absence of frame buildings, the per capita loss is as low as 33 cents.

It is probable that the per capita loss in Canada is as large as, if not larger than, that of the United States. In both countries frame buildings are common. In both, also, there has been until recently, no organized effort to impress the public with a sense of the irremediable and appalling losses incurred through fire.

While in our larger cities fireproof business structures are the order of the day, it is yet true that the vast majority of Canadian dwellings, shops, warehouses, factories, and public edifices are either completely inflammable, or only partly fireproof. Our principal efforts to guard against fire and its results are respectively our fire-fighting brigades and our insurance systems. These, in themselves, constitute heavy annual drains on our resources. Insurance, in any form, is merely a means of indemnifying the individual at the expense of the community. Like fire-fighting organizations, insurance is a costly superfluity. The one and only adequate preventive of waste through fire is a change from our present methods and materials of construction.

In effecting this change,—a change implying the more general utilization of mineral products such as brick, concrete, building stones, slate, tiles, metallic members, and insulating material such as asbestos, mica, and slag products,—the mineral industry will be given a tremendous impetus. And, instead of depleting our forests to erect perishable and unsightly structures, we shall put a premium upon architectural permanence and fitness.

As we have pointed out above, the materials that go into our modern office buildings are fireproof. But the myriad small buildings and dwellings that dot the country and make up our villages and towns are composed in nine cases out of ten of wood. In some parts of the Dominion this is not avoidable. But in Nova Scotia, in parts, at least, of New Brunswick, and Quebec, and throughout large portions of Ontario and Manitoba, fire-resisting material is as cheap, or almost

as cheap, as wood. Further, it is only a question of time when similar conditions will obtain in Alberta and the West generally.

While we must acknowledge that wood as a building material cannot be replaced in every part of Canada, yet measures can be taken to render wooden houses comparatively unburnable. Asbestos sheathing affords probably the best protection. Asbestos shingles, tiles, boards, in all manner of shapes are being put on the market. Metallic sheathing is also a useful, though not ornamental, means of protection. It is worthy of mention that for years the fire laws of Dawson City, Yukon Territory, have made obligatory the sheathing of buildings with uninflammable substances.

But it is in our larger centres of population that a change is most needed. Wooden floors, partitions, staircases, should long ago have disappeared from our public buildings. The use of reinforced concrete, or of some equivalent, should be enforced by law in all cities. In suburban and country communities, measures only less stringent should be put into effect.

All this, naturally, cannot be done at once. It will take years to form public sentiment. But we are convinced that this is a subject that should be discussed by our legislatures and, in fact, by all our city, town, and county councils. The loss that Canada suffers annually through fire, is enormous enough; but another and a heavier toll is paid. Dozens, perhaps hundreds, of human lives are sacrificed because as a people we are ignorant and indifferent.

In developing our theme we fear that we have overlooked our original text. What we started out to say was that before the captains of our asbestos, cement, clay, mica, and iron industries lies the opportunity of educating the people up to the use of safe materials of construction. Sooner of later this must come. Canada should not be the last of civilized countries to remove the scales from her eyes.

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## PRODUCER-GAS POWER PLANTS.

Despite many failures, failures due both to inefficiency on the part of operators and to inherent defects in the plant itself, the gas-producer as a source of power is more than holding its own. Trouble has arisen in not a few Canadian installations. In several instances that have come to our notice the manufacturers have been to blame. In other instances the ignorance of the operator has brought disaster. But, on the whole, the gas-producer has established itself as one of the few economical sources of power.

Such is the present demand for producers and gas-engines that one new Canadian manufacturing concern, organized but a few months ago, has orders on hand that will tax its capacity for two years to come. Both British and United States manufacturers report excellent business.

But while no one can dispute the fact that the producer and gas-engine are to play a large part in our industrial growth, it may not be amiss to allude here to the tendency towards disregarding local conditions in considering the selection of a power plant. Our remarks apply, of course, only to the equipment of mines.

The belief that the gas power plant is bound to replace all steam installations is not warranted. Initial cost of plant, transportation charges, the probable life of the mine, and the probable net earnings throughout its lifetime, must all be weighed carefully. Due consideration of these factors will frequently lead the engineer to conclude that he must sacrifice actual mechanical efficiency and must be influenced mostly by the immediate requirements of his mine. In other words, a cheap steam plant, representing only a small outlay, often serves the purpose with more ultimate economy than would a more elaborate and costly outfit. It may be bad engineering to install a producer-gas power plant if a non-condensing Corliss engine will fill the bill.

That our meaning may be clearer we may add that we have no shadow of doubt as to the assured future of the producer-gas plant. It has come to stay. Its use will extend. But, for the present at least, there are limits set. These limits must be recognized. The engineer must not allow himself to be carried away by the mechanical beauty of a device that is sometimes unsuited to meet the requirements of mines situated far from transportation; or that, in point of cost, throws out of balance the mining business that he is conducting.

As our transportation lines improve and increase, and as suitable fuel becomes cheaper, the steam plant will gradually be replaced. But its days are not yet numbered.

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## TWO RECENT CANADIAN INVENTIONS.

Two Canadians have recently entered into the field of invention in mining machinery. Mr. John Redington, mine manager of the Coniagas Mine, Cobalt, Ont., has introduced several modifications in the standard design of rock-drill valve and piston. Ten of his drills are in use at the Coniagas mine. The parts are machined and assembled at the mine. The drill is reported to be giving every satisfaction.

Another invention, a rock-drill chuck, patented by Mr. H. W. Schorlemmer, Rossland, B.C., has been given full trial at the mines of the Consolidated Mining & Smelting Company. In the new chuck there are no bolts and nuts to tighten; the operator merely slips in his drill and turns on the air. The drill tightens automatically, and does not work loose. To release the drill it is only necessary to tap a wedge which is part of the chuck.

## NEW DEMANDS OF THE U. M. W. A.

Following a visit from Mr. E. S. McCullough, ex-vice-president of the U. M. W. A., to Port Morien, the North Atlantic Collieries Company, has been served with notice by a local of the U. M. W. A. of various demands. These are as follows: Recognition of the United Mine Workers, reception of their pit committee, granting of a "check-off" system, permission to inspect the balance sheet and books of the company at intervals to see whether or not an increase of wages is justified, and an undertaking on the part of the North Atlantic Company not to mine or load any coal for any company at whose mines members of the U. M. W. A. may be employed. These are modest demands. This occurrence but serves to emphasize our previous contention, namely, that Canadian companies are at the mercy of the heads of the international labour unions.

Take this particular instance as a case in point. The North Atlantic Collieries is a small concern, which has never at any time been very remunerative. No matter how preposterous the demands of an international union, nor how small the Canadian company, there is nothing in our laws to prevent the whole financial force and the whole official personnel of the union from being concentrated upon one single devoted company. Instructions can be issued in the United States and carried out in Canada. American money can be used without let or hindrance to destroy Canadian industries, and apparently no power in our country can say nay. What magic is there about a labour union that it should be exempted from the ordinary protective laws which a sovereign country exercises over the actions of aliens within its borders? The United Mine Workers of Canada is not an incorporated body, either in the United States or in Canada; its officers report to no government authority; its finances are untrammelled by legislation that joint stock companies must recognize. Canada is usually supposed to be a free and democratic country, affording to its citizens the rights of individual liberty. But the fact remains that its citizens can be prevented from exercising their right to work, and the investments of other citizens can be rendered worthless at the beck of a labour leader in the United States. Ottawa cannot prevent the alien from sending his money here, nor can Ottawa deport the undesirable agitator when he is stirring up strife. The situation would be amusing were it not so humiliating. We erect a high tariff barrier against United States imports that interfere with our industries; we bar the willing European worker, no matter what his qualifications, unless he can produce twenty-five dollars; we deport the indigent and the feeble; we keep out the immoral and the diseased; but the international union delegate who comes in the sacred name of labour is admitted and allowed to remain, no matter how incendiary his speeches nor how dangerous his mission to our industries and our workers.

## GRANBY AND SOME DEFINITIONS.

After reading current reports of the Granby mix-up, we are struck with the fact that much of the difficulty might have been obviated had the phrases "ore in sight" and "ore reserves" been used in their right technical sense. The loose allusions made by Manager Hodges to "ore in reserve" must have referred to probable or indicated ore. By no stretch of the imagination can we conceive of an experienced mining man speaking thus of ore positively blocked out and ready for stoping.

Thus when we are informed that Dr. Sussman reports 6,000,000 tons as ready for stoping, we cannot see that the position of Granby is bad. This quantity will provide about five years' ore supply at the present rate of consumption. This is all that can be expected, so far as "ore in sight" is concerned.

The future of Granby hinges, therefore, upon those ore supplies, not yet blocked out, ready for stoping, or "in sight," but falling into the category of "probable," or "indicated." Just how far these bodies have been explored remains to be seen. But certainly their extent, or, rather, the presently available knowledge of their extent, is the crux of the Granby question.

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## BUSINESS HONOUR.

An exceptional instance of honourable business methods has come to our notice. Our readers are familiar with Stevens' Copper Handbook. This annual contains a number of pages of advertisements. Usually the volume is revised completely every year. For two years past Mr. Stevens has been unable to revise the volume completely. Feeling that this fact will affect the circulation of the book, Mr. Stevens has, nevertheless, notified each subscriber. Further, considering it prejudicial to lower his advertising rates, but feeling, also, that he is not justified in charging full rates, Mr. Stevens has decided to reprint all advertisements for this year free of charge.

The frankness and candour with which Mr. Stevens has faced the situation are refreshing, and, so far as our experience goes, unique.

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## GRANBY AFFAIRS.

Elsewhere we publish a communication dealing with the Granby muddle. Our correspondent points out that if it be true that ore available is limited to six million tons, then an independent examination should be demanded at once. Statements made within the last two years by Mr. A. B. W. Hodges, who recently resigned the managership, indicated his belief that much larger quantities were in sight. The late slump is attributed to rumours contradicting Mr. Hodges' assertions.

It is neither wise nor desirable to diagnose the trouble at its present stage. But it is imperative that full investigation be made without delay. The directors must spare no pains to clear themselves. The pub-

lic has a right to know whether stupidity or something less excusable has brought about the present unfortunate circumstances.

### THE LAST STRAW.

We must express our sympathy for the unfortunate crusaders who, a few weeks ago, dashed to the Camel's Back region—and returned. For those who negotiated the slushy spring trails there was little humour in the episode. They will scarcely rise to the bait so easily again. The men who started the false rumour of discoveries need a severe lesson..

The fact remains that northern prospectors are too readily stampeded. Reports of new finds are always, or nearly always, discountable. The best policy is to study the country carefully, to make one's plans with equal care, and then follow out those plans to the letter. Prospecting should be systematic. Wild excursions into the bush do not pay.

### EDITORIAL NOTES.

Apart from obvious physical advantages nickel coins would advertise Canada's resources. The matter should be pressed upon the proper authorities.

The new price set by the Dominion Coal Company on coal sold to the Dominion Steel Company is $1.55 per ton. The former price was $1.28 per ton.

The output of the Western Fuel Company, Nanaimo, B.C., was 48,000 tons during March. This is 3,000 tons larger than any monthly output in the history of coal mining in Nanaimo.

Canadian architects are not as familiar with the uses of asbestos as might be expected. Few of them have had occasion to use it extensively. This should not be the case. Practical immunity from fire risks can be had very cheaply by using manufactured asbestos.

# ANNUAL REPORT OF THE NOVA SCOTIA DEPARTMENT OF MINES FOR 1909.

The annual report of the Nova Scotia Department of Mines shows, once again, a decided improvement in form and arrangement. While there is still much room for change, especially in the matter of statistics, we are glad to note that the Department is making some progress. We suggest, as we have suggested before, that the mine accidents be summarized and resolved into rate per thousand men employed. Moreover, some effort should be made to embody in a tabular statement the tonnage and money value of all mineral outputs for the year.

## COAL TRADE.

The returns of coal sold during the year 1909 show, compared with the returns for 1908, as follows:

| | 1908. | 1909. |
|---|---|---|
| Nova Scotia | 1,950,632 | 1,769,803 |
| New Brunswick | 510,331 | 542,827 |
| Newfoundland | 207,062 | 156,248 |
| Prince Edward Island | 63,331 | 78,898 |
| Quebec | 2,047,638 | 1,508,817 |
| United States | 499,634 | 320,735 |
| Mexico | 8,907 | ..... |
| St. Pierre | ..... | 10,235 |
| Other countries | 4,697 | 755 |
| Bunker | 193,352 | 227,395 |
| | 5,485,583 | 4,615,713 |

**Coal Production by Counties.**

| | 1908. | 1909. |
|---|---|---|
| Cumberland County, tons | 559,013 | 542,040 |
| Colchester County, tons | 3,951 | 1,330 |
| Pictou County, tons | 777,217 | 667,637 |
| Cape Breton County, tons | 4,556,446 | 3,634,392 |
| Inverness County, tons | 402,655 | 362,516 |
| | 6,299,282 | 5,207,915 |

## COAL MINING.

NOTES FROM INSPECTORAL DISTRICTS.

### Southern District of Cape Breton.

DOMINION No. 2 COLLIERY.—There are 235,000 feet of air in circulation in this mine. One Dixon fan, 29 by 9 feet, produces the current. The seam is 7 feet 6 inches thick, with a pitch of 5 1-2 per cent.

The method of timbering is props-and-caps. Minimum diameter of props is 4 inches.

The colliery has a complete water system. Every thousand feet there are connections with air lines. Working places are sprayed every night. Ackroyd and Best safety lamps are in use. The pit bottom is arranged with revolving tipples and storage tanks. Compressed air is used as motive power.

Excellite powder is used.

Haulage is all plane-rope, except on levels to pit bottom, where air locomotives are used. Room-and-pillar system is followed.

DOMINION No. 3 COLLIERY.—There are 50,000 cubic feet of air in circulation in this mine. One Capell fan, 13 1-2 by 7 1-2 feet, is in service.

Coal seam is 7 feet 6 inches thick, pitching 8 per cent. The mine is worked on the room-and-pillar system.

The compressed air pipe can be coverted into a water line. Ackroyd & Best safety lamps are used.

DOMINION No. 4 CALEDONIA COLLIERY.—The ventilating of this mine is done by one Dixon fan 14 by 6.4 feet, and one Murphy fan, 12 by 6 feet, delivering 100,000 cubic feet of air. Seam is 7 feet thick, pitching 8 degrees. Props used measure 5 inches at the small end.

The mine is worked on the room-and-pillar method. Rooms are 20 feet wide. Pillars under land area are from 25 to 35 feet thick; under the sea area from 27 to 40 feet thick.

The water for steam and for fire protection is drawn from the town system. Ackroyd & Best safety lamps

are used. The explosives used are Excellite, in pillars; and Bulldog, in rooms and narrow places.

Endless haulage on the deeps and main level.

DOMINION No. 5 COLLIERY.—Air, 190,000 cubic feet, is supplied by two fans—one 24 foot Guibal, and one 15 foot Chaneller. Room-and-pillar. Ackroyd & Best lamps.

DOMINION No. 6 COLLIERY.—One Walker fan, 20 by 7 feet, supplies 48,172 cubic feet of air. Bord-and-pillar method in mining. Ackroyd & Best lamps. Bulldog powder. Five and one-half tons of coal are produced for each pound of powder used.

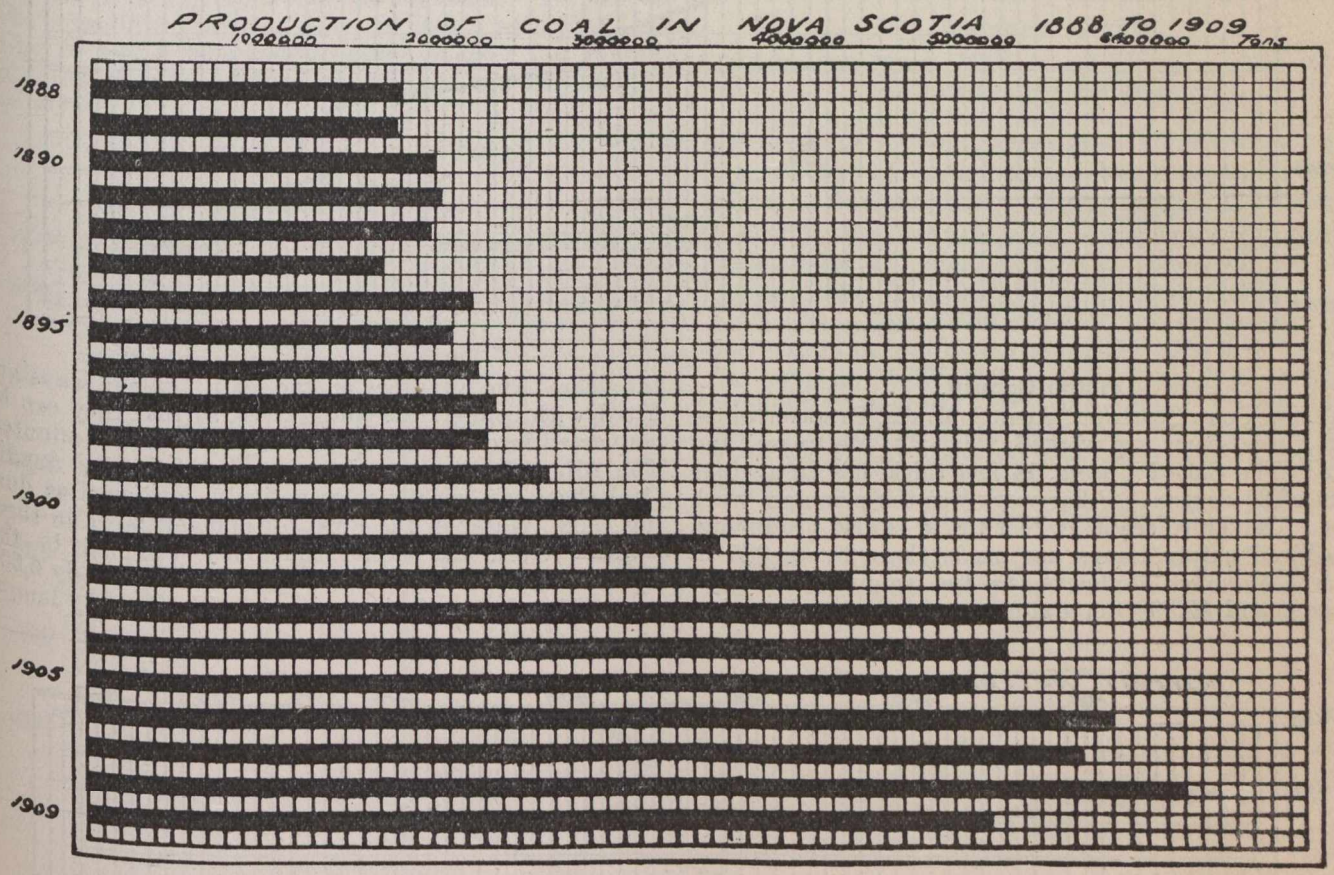
DOMINION No. 7 COLLIERY.—One Capell fan, 12 feet by 11 feet 6 inches, supplies 60,000 cubic feet of air. Room-and-pillar. Bulldog powder.

of similar capacity is held in reserve. Both endless and plane haulage systems are in vogue.

N. S. STEEL & COAL CO., SYDNEY No 2 COLLIERY.—Bord-and-pillar system. Coal all mined by machines of the Hardie and Whitcomb type, driven by compressed air. Marsant safety lamps.

SYDNEY COAL COMPANY.—Employs only 10 miners and 5 unskilled workmen. Open lights are in use.

N. S. STEEL & COAL CO., SYDNEY No. 3 COLLIERY.—On a seam 4 1-2 to 5 1-2 feet thick, three parallel slopes now down 8,885 feet are driven. Daily output, 1,000 tons. Method of working, bord-and-pillar. Width of rooms, 20 feet. Pillars, 25 feet to 40 feet, according to cover. Cross-cuts driven every 60 feet. Coal cutting machines, puncher type, are operated by compressed




DOMINION No. 8 COLLIERY.—One Murphy fan, 8 feet in diameter, supplies 58,000 cubic feet of air. Bord-and-pillar. Marsant safety lamps. Bulldog powder. Endless haulage.

DOMINION No. 9, DOMINION No. 10, and NORTH ATLANTIC COLLIERIES complete the list in this district.

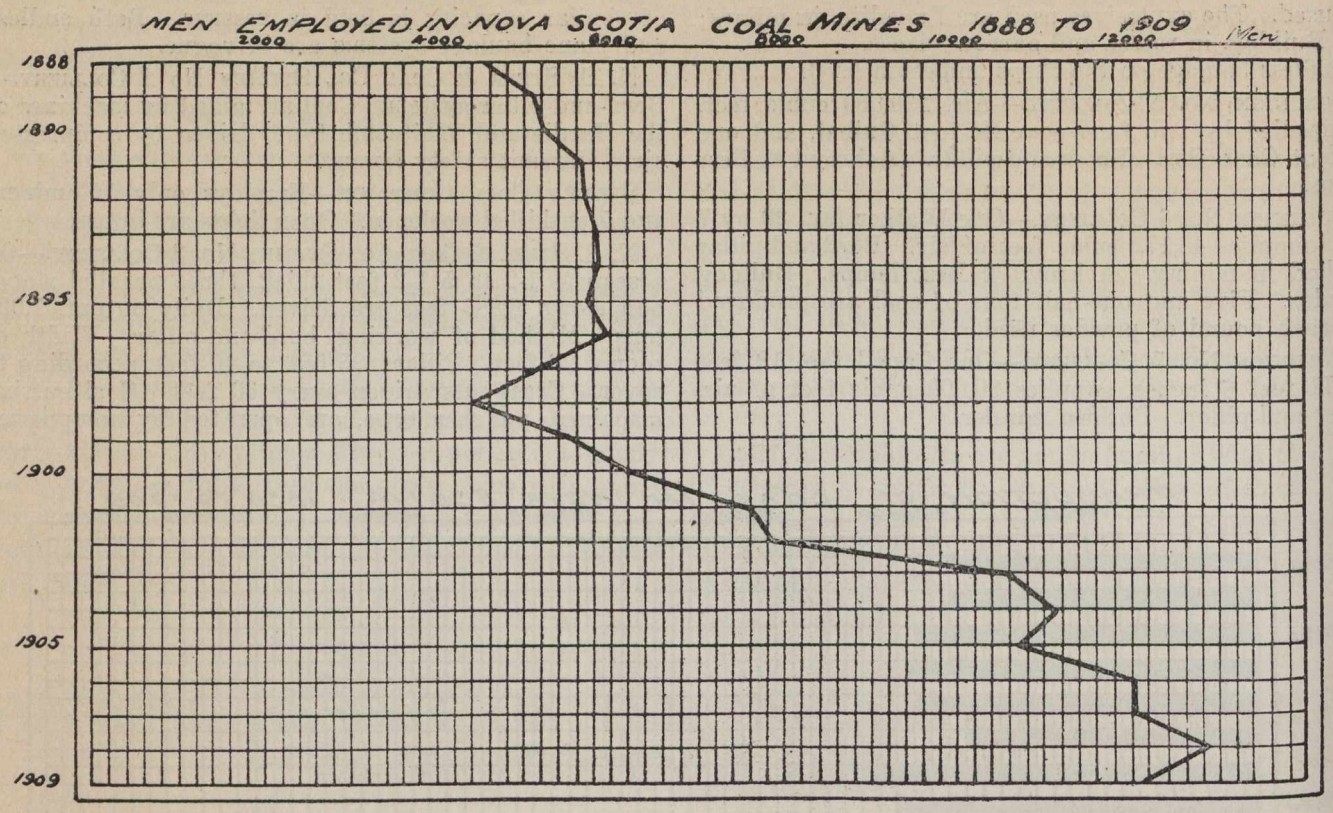
### Northern District of Cape Breton.

N. S. STEEL & COAL CO., SYDNEY No. 1, COLLIERY.—877 men are employed here. The output during the year was 250,470 tons, of which amount 118,284 tons were mined in pillars. Bulldog powder was used to the extent of 21,361 lbs. Thickness of seam, 5 feet to 6 feet. Coal, soft and gaseous. Roof and floor are shale. System of working is room-and-pillar, rooms being 17 feet wide and pillars 60 feet thick, with crosscuts driven every 60 feet. Coal all mined by hand picks. A Capell fan, 20 feet by 5 1-2 feet, delivers 120,000 cubic feet of air. A spare 30 by 10 Walker-Guibal fan air. Asbestos fibre brattice cloth and board are used. Marsant lamps. Endless haulage. One Capell fan, 15 by 7 1-2 feet, delivers 48,985 feet of air. An auxiliary fan, a Murphy, 10 by 6, delivers 59,900 feet.

N. S. STEEL & COAL CO., SYDNEY No. 4 COLLIERY.—Coal mined by means of four class E.6 Sullivan electric coal cutters; also by hand. Plane haulage. Bord-and-pillar. One Sirocco fan, 4 1-2 feet diameter, 5 foot blade; and one Sturtevant fan, 6 feet diameter, 3 foot blade. Marsant lamps. Monobel explosives.

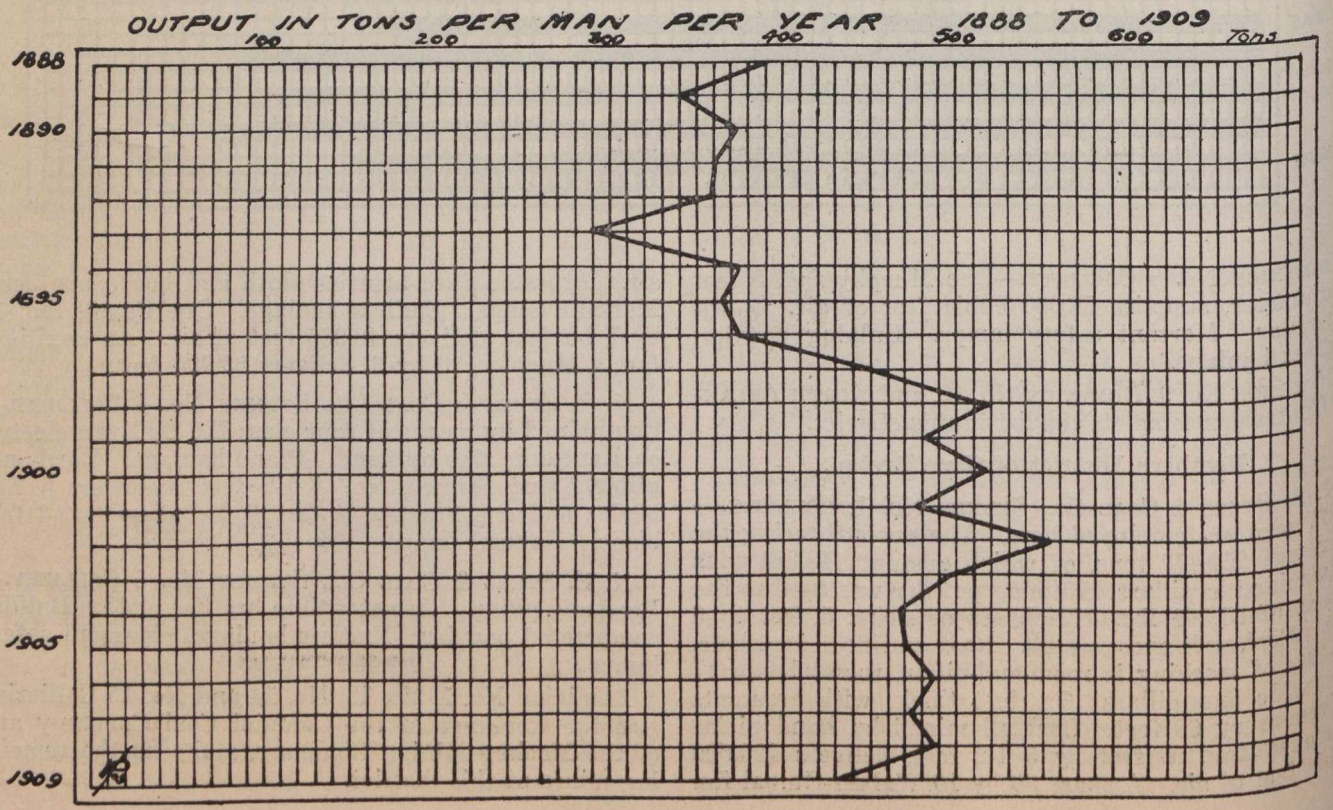
N. S. STEEL & COAL CO., SYDNEY No. 5 COLLIERY.—Bord-and-pillar. Asbestos fibre brattice cloth. Bulldog compressed powder. Endless haulage. Marsant safety lamps.

Dominion No. 1, No. 12, No. 14 and No. 15 Collieries, and the workings of the Colonial Coal Company and of the Mackay Mining Company, make up the remaining mines of this district.



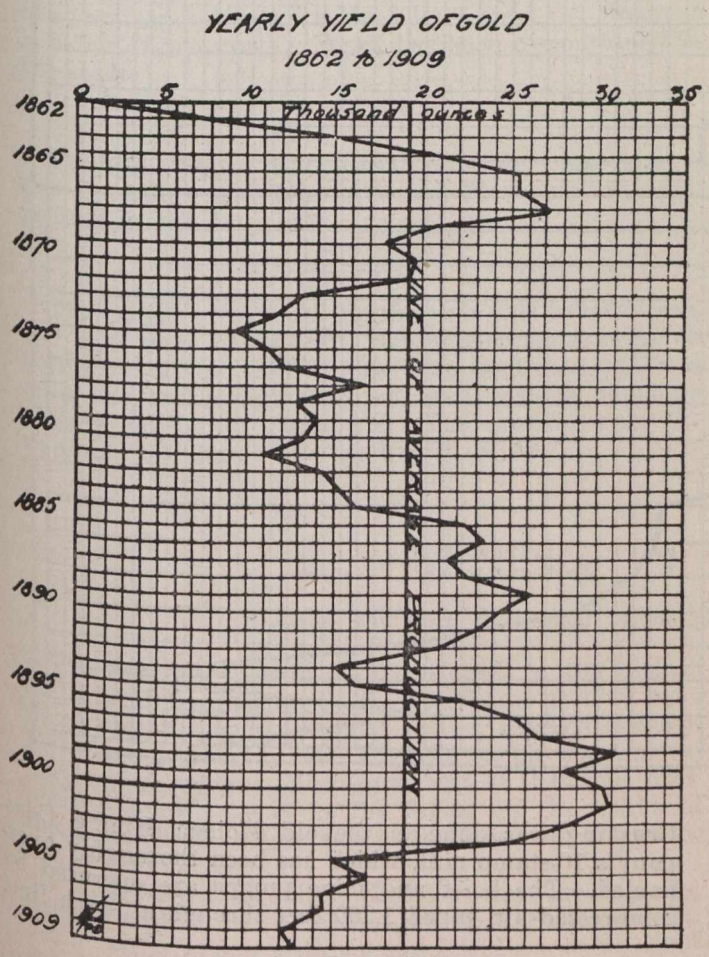

### Pictou County.

Acadia Coal Company, Albion Mines, Stellarton.—Here three seams are worked, Cage-Pit, McGregor, and Third. The Cage-Pit seam, 14 feet thick, has an average pitch of 25 degrees. Pillar work was the principal work done. The Third seam, 12 feet thick, is also producing. 270 Wolff safety lamps are used; there being 385 in stock. Monobel explosive, to the amount of 16,682 pounds, and 32,898 detonators were consumed during the year. The air pipes on the main haulage ways are fitted with connections and valves, so that they can be converted into a water system in less than five minutes. The Allan Shafts, owned and operated by the Acadia Coal Company, were not so actively developed as during 1908. Water in the Ford pit hampers work in these shafts. Work has been principally confined to the Ford seam in No. 2 shaft. No. 1 shaft output only 6,559 tons. Monobel explosive was used. Wolff safety lamps.



ACADIA COLLIERY.—Work here was also curtailed to a certain extent. The airways are reported to be in a very bad condition, and insufficient air is supplied. The mine is worked longwall, the length of each wall being 37 feet from lowside to lowside. Tarred canvas and, in some cases, boards are used for brattice. No explosives are needed. Wolff safety lamp. A 13.6 by 4 Capell fan, driven by a 100 h.p. Robb Armstrong tandem engine, supplies air. Vale Colliery, Thorburn, has been well developed. Bord-and-pillar system and longwall. Ackroyd-Best and Marsant lamps, with electric lighters and patent re-openers at the surface and mine stations. Monobel explosives. One 28-foot Walker fan.

INTERCOLONIAL COAL COMPANY.—The Drummond Colliery was in steady operation. The mine is divided into sections. In No. 1 section no explosive is used. Excellite powder is used in No. 2 and No. 3 sections. Tarred canvas is used for brattice. Marsant lamps with plug lock. One 20 foot 6 inch indestructible Walker fan supplies air. All the underground engines are run by compressed air.




### Cumberland and Colchester Counties.

CUMBERLAND COAL & RAILWAY COMPANY, SPRINGHILL COLLIERIES.—Good deal of development work done. Dynamite and saxonite are explosives used. Capell fans. Marsant lamps. Lino-tarred brattice cloth.

MINUDIE COAL COMPANY, MINUDIE MINE—River Hebert. Slope is down 2,300. Development work is being pushed. A Stine fan supplies 25,000 cubic feet of air per minute. Asbestos brattice cloth. No spraying apparatus. Black powder and dynamite. Open lights. Longwall advancing. The three-foot seam has a clay parting in centre. Seam pitches at angle of 19 degrees.

MARITIME COAL, RAILWAY & POWER COMPANY, JOGGINS MINE.—Steady progress here. Haulage system changed from tail-rope to endless. New tipple, screen, and picking tables, and 36 new tenement houses. One Sturtevant fan, 7 feet by 8 feet 9 inches, supplies 20,000 cubic feet of air. Seam four feet, pitching 17 1-2 degrees. Bord-and-pillar and longwall systems. No spraying. Marsant lamps. Tarred cloth for brattice. Black powder and dynamite. Chignecto Mine, operated by the same company, worked steadily. Bord-and-pillar and longwall. Open lights. Black powder. Main-rope haulage. One 14-foot fan made by Londonderry Iron and Mining Company, direct connected.

The Fundy Mine is closed. So also is the Great Northern, one of "Dr." Hugo Von Hagen's fakes. The Jubilee and De Bert mines are doing nothing. The Strathcona mine, River Hebert, produced 5,835 tons.

### Inverness County.

INVERNESS MINE (McKenzie & Mann).—Fair development here. Bord-and-pillar and longwall. Both tail-rope and horse haulage used. One 7 by 18 Walker fan. Austen's No. 2 twill brattice cloth. Acadia No. 3 blasting powder. Although the mine is reported to be non-gaseous, Marsant safety lamps are used throughout.

THE MABON MINE, MABON, was operated by the Government for five months. It is now flooded.

THE PORT HOOD-RICHMOND COAL & RAILWAY COMPANY.—The Port Hood mine of the company. Slight decrease in output owing to strike. One 6 by 14 Dixon fan supplies 50,000 feet of air. Seam is 6 feet thick, pitching 22 degrees. Bord-and-pillar. Rooms, 14 feet wide; pillars, 35 feet. Mine is dust free. Gaseous. Ackroyd & Best magnetic lock safety lamps. Monobel powder.

### Coal Mine Accidents.

These will be the subject of a separate article. It may be noted, however, that no proper statistics are set forth in the Annual Report. This is a lamentable omission.

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## GOLD.

During the year 19 companies, operating in 19 districts, produced 12,597 ounces from 59,058 tons of ore, a slight increase over the preceding year. The total value was $239,353; the average value per ton being $4.05. This latter figure is 24 cents greater than the average for last year. About 500 men were employed. No fatalities occurred.

We shall glance over a few of the larger concerns.

### Guysboro County.

THE NEW ENGLAND MINING COMPANY (formerly the Boston-Richardson Mining Company), Isaacs Harbour. 88 men were employed here. 41,425 tons of ore yielded 5,024 ounces of gold, valued at $95,456. 82.6 per cent. of the total was recovered by stamp amalgamation; from 1171.5 tons of concentrate, 17.4 per cent. The increase indicated over the previous year is 3,425 tons crushed and 938 ounces gold recovered. The average yield per ton is 24 cents higher. The reported costs were $1.07 for mining; for milling, including bromo-cyanide treatment of concentrate, $0.71 per ton of ore. The actual cost of bromo-cyaniding one ton of concentrate was $3.06. The average recovery was 78.7 per cent. At the end of September the broken ore in mine was estimated to be 18,000 tons.

At a small working at Lower Seal Harbour, Edgar

Silver and others mined and milled 393 tons of ore, yielding 288 ounces of gold.

THE SYDNEY GOLD MINING COMPANY, County Harbour, recovered 455 ounces of gold from 510 tons of ore.

At FOREST HILL, McDonald & Copeland obtained 415 ounces of gold from 289 tons of ore.

### Halifax County.

THE EAGLE MINING COMPANY, Salmon River, got 97 ounces from 143 tons of ore mined and milled.

THE DOMINION MINING COMPANY, Tangier, obtained 62 ounces of gold from 180 tons of ore. This ore came from development work. A complete hydro-electric plant is now completed. Power is derived from dam on Tangier River and transmitted one mile. The mine will be worked on a larger scale this year.

CARIBOU GOLD MINES, Caribou.—About 40 men are employed here. From 1,055 tons of ore 824 ounces of gold were gotten.

M. J. O'BRIEN, Moose River.—The old Touquoy water-power mill was worked here on lease. 3,135 tons of ore yielded 539 ounces of gold.

OLDHAM STERLING GOLD COMPANY, Oldham.—From 940 tons of ore mined and milled, 2,710 ounces of gold were recovered, an average of 2.88 ounces per ton. (The average yield for the previous year was 4.53 ounces!) The shaft, an incline, is down 1,525 feet on the dip, or 850 feet vertically. At the shaft bottom the dip is 43 degrees. A Pelton water-wheel is installed to develop power for mill and crusher. The wheel is working under a 72-foot head, fed by a 14-inch pipe line.

THE OLDHAM MINING COMPANY, Oldham, won 204 ounces from 224 tons of ore. The ore was crushed at the mill of the Oldham Sterling Company.

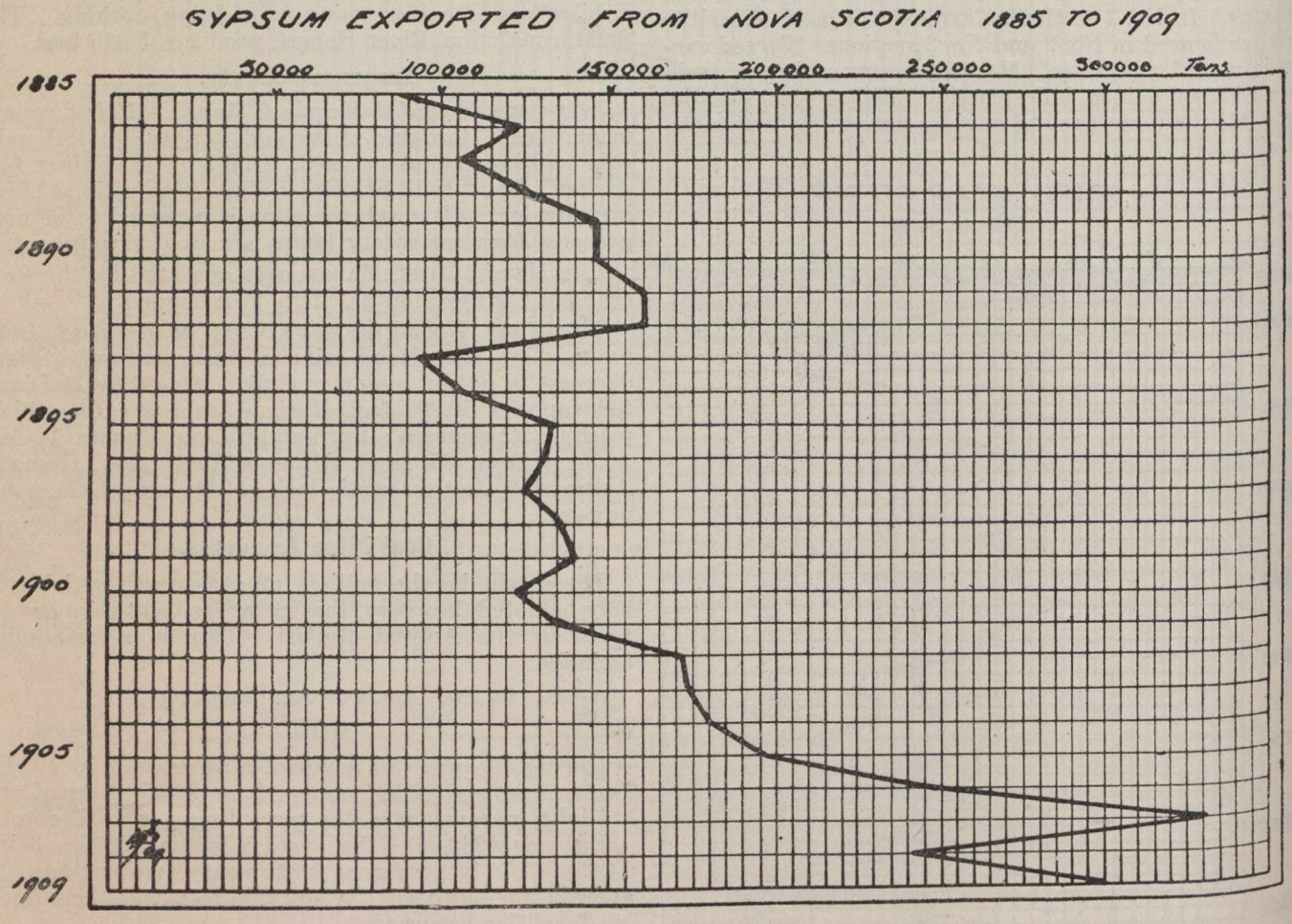
THE PETPESWICK MINING COMPANY, Lake Catcha, devoted the year to development.

THE CHESTER BASIN GOLD SYNDICATE, Gold River, obtained 307 ounces of gold from 791 tons ore crushed and milled.

THE UMACKE MINES & POWER COMPANY won 87 ounces from 100 tons of ore.

### Queens County.

THE PONHOOK MINING COMPANY, Molega Barrens, mined 1,006 tons of ore, yielding 612 ounces of gold. Crushing was done in the old Molega Mining Company's 10-stamp mill, which has been thoroughly overhauled. The hoist and mine pumps are operated by compressed air, piped 1,260 feet through a 3-inch line.




### Hants County.

THE EAGLE MINING COMPANY, Renfrew, obtained 45 ounces of gold from 180 tons of ore.

### Victoria County.

THE GREAT BRAS D'OR GOLD MINING COMPANY, Middle River, milled 1,783 tons of ore, yielding 708 ounces of gold.

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## IRON.

During the year iron ore imports amounted to 666,050 tons, classified thus:

| From. | Tons. |
|---|---|
| Newfoundland | 639,527 |
| United States | 9,579 |
| Spain | 9,481 |
| Norway | 5,428 |
| Ontario (Moose Mountain) | 2,035 |
| | 666,050 |

The only iron ore mined in the province is credited to the Canada Iron Corporation. Their Torbook workings produced 12,000 tons from development entirely. None has been shipped.

The total production of pig-iron was 307,330 tons. The only producers were the Dominion Iron & Steel Company, Sydney, and the Nova Scotia Steel & Coal Company, New Glasgow and Sydney Mines.

### COPPER.

LAKE COPPER COMPANY, Lochaber, Antigonish County. 14 men were employed. Shaft is now 290 feet deep. Drift from shaft bottom is 40 feet. An adit is in east 325 feet, connecting with No. 1 level west. A cross-cut is being driven north. Work has been discontinued in the shaft.

### LEAD-SILVER.

Two small concerns, one near Boisdale, Cape Breton, and the other near Musquodoboit Harbour, are prospecting galena deposits.

### GYPSUM.

The output of gypsum for the year was 299,045 tons. 600 men were employed. Eleven companies were in active operation. 25,000 tons were used in small local mills for the manufacture of wall cement, finishing plaster, plaster of Paris, etc. The remainder of the gypsum was shipped to the United States.

### BUILDING STONE AND BRICK.

Four companies are reported as quarrying a total of 19,400 tons of stone (variety not specified). 22,000,000 bricks and 300,000 feet of drain pipe were manufactured by 17 concerns.

The records of the Provincial diamond-drill will be touched upon later.

### PETROLEUM IN JAPAN.

According to a report in the "Deutsche Japanpost," a German contemporary dealing with Japanese affairs, a trade combination has been formed among the four large petroleum companies which supply oil to the Japanese market, the result being a rise of price of 10 sen per case. The companies referred to are the two Japanese firms, the Hoden Sekkyn Kaisha and the Nippon Sekkyn Kaisha, and the two American firms, the Standard Oil Company and the Rising Sun Company. The total consumption of Japan per annum is reckoned at 10,000,000 cases, of which the two American firms supply about 6,500,000 cases, the Hoden Company 2,300,000 cases and the Nippon Company 1,200,000 cases. The Japanese companies are so far only in the initial stage of their development and are only working oilfields in the Province of Echigo, but they also hold concessions in Hokksido, in the north of Japan, and in Formosa. Their oil is not of so good a quality as the American, but their cost of production is much less and their supply very constant, which enabled them to keep their price always a fraction below that of the American, which is handicapped with freight charges. By the agreement the American firms are instated in the right to meet about two-thirds of the Japanese demand for oil, while the Japanese firms are enabled to turn their attention with profit to the working of their hitherto untouched concessions. The only sufferer is the Japanese public, which now has to pay a higher price for its oil, whether it be the home or the foreign product.

# MINING IN NICARAGUA.

(Written for THE CANADIAN MINING JOURNAL by an Occasional Contributor.)

The first recorded discovery of gold in the eastern division of Nicaragua, C. A., was made in 1886 by a Sumo Indian, named Josiah of Youga. Gustavo Schultz, a German merchant, then engaged in buying and exporting rubber from Nicaragua, was at that time prospecting for cinchoria in the forest on the banks of the Youga river. Here he met the Sumo Josiah, whose life he had saved.

Josiah asked Schultz what he was looking for. Schultz replied that he was in search of Peruvian bark. Josiah said: "Come with me and I will show you something better." He then took Schultz to Matice creek, a branch of the Principulca river, and turned over a flat stone, showing him a quantity of fine gold mixed with the black sand of the creek bed. Schultz immediately commenced work on the newly-discovered placer deposit and gathered the first riches, which, according to some interested parties, amounted to one ton of gold. This estimate of the production may be excessive, but it is known that Schultz was then in debt to the tune of $200,000. Shortly after he started placer operation on the Matice creek, he liquidated his account.

The gold of the Matice creek was derived from the erosion of an ore deposit, now known as the La Lus y los Angeles Mine. This is probably the richest mine yet discovered in this part of Nicaragua, though its monthly bullion shipments have not exceeded six or seven hundred ounces, owing to the poor management and defective surface equipment.

The "El Dorado" and "The Monte de Oro" mines, which are situated a few miles from the Matice creek, yielded considerable gold in the early days, but during the past few years have been worked in a desultory manner with negative results.

Some rich placer ground was discovered in the Cuicuinita district, situated twenty miles or so southeast of the Matice creek, about a year after Schultz commenced sluicing operation. This camp produced a large amount of placer gold, but so far no mineral veins have been found in Cuicuinita. The country east of Cuicuinita, drained by the Wowales creek and its branches, is not mineralized.

Bacan, which is a mesa or table-land, between the Cuicuinita and the Matice or Suina district, has produced about 2,000 ounces of alluvial gold, apparently derived from some small veinlets in porphyry.

In the year 1888 or 1889, a Jamaican rubber hunter named Grimmins, discovered the Constancia mine of

the Piz-Piz district, and a little later the Siempre Viva was located in the same mineral zone.

From that time several mines have been discovered in the Piz-Piz, and the district has been the centre of the mining activities of the Mosquito Coast.

Following the mineral discoveries in Piz-Piz, the Ocumwass district attracted prospectors with the location of the El Paraiso, the San Domingo, and some other mines of minor importance. The El Paraiso is a contact deposit between limestone and the Ocumwass shales. The main shaft is down about 115 feet and is the deepest in the country. The outcrop was very rich in places. The vein filling is chiefly calcite. The San Domingo is reported to be a clastic dike with high values in gold.

The La Luna mine is in the Ocumwass district and is a promising investment. Ocumwass has yielded a large amount of gold, chiefly as placer, or from the workings of some exceedingly rich verticals which paid to work in hand mortars.

The Minisota mine lies between Ocumwass and Piz-Piz. The gold here is an impregnation which has been traced in a northeast and southwesterly direction for about 15 miles. Scattered along the line are a number of mines such as Dos Amigos, Renco Viejo, Escondido, America, etc.

The Minisota is reported to have produced about $60,000 or $70,000 in gold, a large amount of which was recovered by washing a gold-bearing manta, which was formed by the leaching out of rich pockets in the impregnated porphyry.

In the Dos Amigios there is a manta which the owner claims to average $19.50 per ton in gold. The method of securing data is by drilling holes to bed-rock with a large auger, panning, sampling and assaying.

In the Bana Cruz district five or six veins carrying values in gold, have been denounced: the New America, the Union, the Sunshine and the Libertad . The samples from the New America assayed from $4 a ton to $80; the Union samples from $30 to $700 per ton, and eight samples from the Libertad from $3 to $79 per ton. Bana Cruz is reported to possess some water power, but there is no exact information on this subject. The mineral veins of the district appear to be faulted and shattered in places.

Several gold mines have been discovered in the Wawa district on the banks of the Wawa river and its branches, but the mineralization is, in general, poor; in fact the district may be classed as a zone of lean and sterile ores. There have been two notable exceptions, the Coco mine and the Tilba mine. Both of these mines produced considerable gold, and proved very profitable to their owners.

In the Wahawass district of the Wawa river some placer gold and platinum have been recovered by washing the creek beds.

The country rock is chiefly granite schists and porphyry. The Mother lode is on a contact between granite and porphyry and is covered in places with a manta ten to fifteen feet, which consists of a sintery mass of oxidized material earthy and black, carrying good values in free gold.

The gold in the Wahawass district was valued at $18 to $18.50 in the New Orleans Mint.

Cocoalya River.—Gold has been found in several parts of Cocoalya, but in general this may be considered a neglected section, as few prospectors have been through this part of the country.

Wanks River.—Miller's mine, on the Umbera creek, Wanks river, ranks next to Schultz's mines as a gold producer. Both placer and quartz gold have been produced in large quantities. Nuggets weighing from three to thirty-two ounces have been found in the wash which extended up the side of a hill. The overburden was fifty-eight feet in places.

The placer gold was evidently derived from the oxidization of a rich iron pyrite deposit carrying gold, which crosses the hill at right angles to the main pay channel.

In the Waspook creek of Wanks river an extraordinarily rich veinlet was discovered and worked by Juan Alresing some years ago. Lapierre bought the property in November, 1899, and in January, 1901, made the first shipment of bullion, time of development and equipment, therefore, being thirteen months. From the first shipment of January, 1901, to May, 1906, the bullion production of the Bonanza mine has amounted to the sum of $453,102.77. During the dry months of April and May when there was only water enough to run two or three 3 1-2 foot Huntington mills, there was a net profit on the mining operations of $6,350 for the two months, and the yearly gain amounted to 50 per cent. of the proceeds.

On November 29th, 1907, J. T. Clark arrived at the Morning Star Mine with supplies and tools. After considerable prospecting on the property, which is claimed to have exceeded the work done on any of the other mines in the vicinity prior to mill operation, Clark commenced milling with a three-stamp prospecting mill (250 pounds each) on November 15th, 1908. The time of prospecting and equipment was twenty months. In eight months' run with only a prospecting mill, the mine yielded bullion to the amount of $11,093.91, or 530 fine ounces gold and 255 silver as per mint returns.

On February 1st, 1905, H. B. Humphries bought the Santa Rita mine for W. D. Parker. On November 14th, 1905, Parker left the Bonanza mine. Later he returned and on July 24th, 1906, he commenced milling.

As per data from the "American" (the newspaper of Bluefields), dated December 19th, 1909, the shipments were as follows: The Bonanza mine, 1,586 ounces; Lone Star, 814 ounces; Santa Rita, 272 ounces; Siempre Viva, 712 ounces; Linda Ventura, 60 ounces; and other shipments, 450 ounces. This is but a part of some of the shipments, as a fair amount is shipped from other sources. However, it shows what has been accomplished up-to the present, with quite inadequate equipment at the mines. The country has up to the present been barely scratched. Capital is needed and needed badly.

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**The South African Mining Journal, 19th Anniversary Number, March 12th, 1910.**—In this very creditable issue our enterprising contemporary departs from its usual custom and incorporates a number of half-tones. Many highly instructive contributions appear. Not least interesting is a sketch of the history of the S. A. Mining Journal itself. An article on the development of mining during the past seven years in Rhodesia is also noteworthy. The total value of the mineral production of that country up to date totals £15,428,970. In this total gold is by far the largest item—£14,682,744. Coal comes next with £363,640. Then chrome iron ore, £139,099; silver, £113,906; lead, £61,774; diamonds, £39,115; copper, £21,266; tungsten ores, £10,930; asbestos, £2,875, and antimony £275. The total value of the mineral output last year was £2,808,123, of which gold made up £2,623,709. Much emphasis is placed upon the need of systematic geological surveys.

# REPORT ON COAL MINES REGULATIONS RELATING TO SUBMARINE COAL AREAS.

(Submitted to the Government of Nova Scotia.)

BY T. E. FORSTER.

Dear Sir,—I have, in accordance with the instructions which you gave when I visited Nova Scotia in August, considered the clauses in the Coal Mines Regulation Act relating specially to Submarine Areas, with a view to advising you as to their suitability to the conditions under which undersea coal is now being worked in the province. In order to enable me to do this, I visited, as you are aware, all the districts in which undersea mining operations are being carried on, and made underground inspections of various mines besides examining the sections of the strata exposed at different points along the coast. In this investigation I had the benefit of your own valuable knowledge and experience, as well as that of Mr. Fletcher of the Geological Survey, while I had further the opportunity of discussing with several colliery managers, questions in relations to the subject in hand. The ready and courteous spirit with which the information I required was everywhere imparted has been much appreciated by me. I now beg to report as follows:

The clauses in the Coal Mines Regulation Act relating to Submarine Areas are as follows:

54. (1) In the working of coal or stratified deposits in submarine areas, the following provisions shall apply:

(a) No submarine seam of coal or stratified deposits shall be wrought under a less cover than one hundred and eighty feet of solid measures. Provided, that the owner or lessee of any such area may drive passage ways to win the mineral to be wrought under a less cover than one hundred and eighty feet, but not less than one hundred feet of solid measures.

(b) A barrier of the mineral wrought, of not less than fifty yards, twenty-five yards on both sides of the boundary lines of every lease, shall be left unwrought between the workings of every submarine seam.

(c) Where there is less than five hundred feet of solid measures overlying the seam or stratified deposit wrought, the workings of every such submarine area shall be laid off in districts of an area not greater than half of one square mile, and the barrier enclosing each separate district shall not be less than thirty yards thick, and shall not be pierced by more than four passage ways having a sectional area not greater than nine feet wide and six feet high. Provided, that the inspector may, if he deems it necessary, permit the said passage ways to be driven with a cross section, not exceeding sixty square feet.

(d) No district shall have its length when parallel to the general trend of the adjoining shore greater than one mile.

(e) A proposed system of working the mineral in each submarine area shall, before work is commenced, be submitted to and approved of by the inspector, and no change shall be made in such approved system without the written sanction of the inspector.

(f) The opening of a new lift or level in a mine already working in a submarine area shall be deemed the commencement of a new winning within the meaning of this section.

(2) The owner, agent or manager of any mine to which this section applies, who contravenes or fails to comply with any provision of this section, shall each be liable to a penalty not exceeding one thousand dollars, and if the offence complained of is continued or repeated after a written notice has been given by the inspector to such owner, agent or manager of any such offence having been committed, the Supreme Court, or a judge thereof, whether any other proceedings have or have not been taken, may, upon application by the Attorney-General, prohibit by injunction the working of such mine. Provided, that the Commissioner may waive or modify any of the provisions of this section when, on the report of the inspector, it appears to his satisfaction that valuable coal areas cannot be otherwise wrought or mined.

R. S., c. 19, s. 52; 1903-04, c. 2, s. 7.

Before discussing in detail the above regulations, I think that possibly it may be of interest and advantage to give a short account of the system under which the working of submarine coal areas is regulated elsewhere.

In this country the undersea coal is the property of the Crown, from high water mark for a distance of three miles seawards, though there are cases in which possession of the coal under the foreshore, between high and low water-marks, is vested in the owner of the coal under the adjacent land where he has been able to prove his title to it either by virtue of a direct grant or otherwise. The leasing of the undersea areas is conducted by the Office of Woods and Forests, assisted by a mining engineer who deals with all technical points relating to the method of working, controls the submarine workings, and looks generally after the interests of the Crown as owner of the minerals, but has nothing to do with the administration of the Mines Regulation Act, which is carried out in the ordinary way by the Inspector of Mines. In other words, the Office of Woods and Forests acts in the same way as any private owner of minerals in this country, and makes such conditions as it thinks fit as to the method of working, to which objection can only be taken by the Inspector of Mines under the Mines Regulation Act in the event of his considering it to be unsafe.

There are no clauses in the Coal Mines Regulation Act dealing specially with submarine areas, as in Nova Scotia, any special provisions as to working being included in the several leases. In framing these conditions it has always been the practice, and I think a sound one, to consider the special circumstances of each letting, rather than to attempt to regulate the whole on a hard and fast basis.

At the present date the leases which are issued by the Office of Woods and Forests generally contain clauses restricting working under a specified cover and providing for the workings being controlled by their mining engineer. The limit of working is, I think, usually placed on what may be termed the "safe side," but as the workings are opened out and information as to the surroundings and experience of the effect of operations is gained, there has, in my experience, been no difficulty in obtaining any reasonable variation of the terms of any lease which the particular circumstances of the case appeared to warrant. I have had as a lessee, a long experience of the system, and I am of opinion that, under it, great advances have been made and large areas have been worked which would otherwise have been abandoned.

So far as I am aware, the only case in which definite regulations for the working of undersea coal (similar to some extent to those in force in Nova Scotia) have been established is that of New South Wales. I have a personal knowledge of this locality, having visited it on two separate occasions, and having acted for a considerable time as consulting engineer to a company engaged in working its undersea coal. Experience obtained in this way enables me to point out that the regulations in question were framed with a view to meeting the special conditions occurring in the vicinity of the Hunter River estuary, where the presence of extensive alluvial deposits overlying the principal seam of coal, combined with its shallow depth, rendered it necessary to ensure special precautions being taken. For this reason, I consider that these regulations generally cannot be taken as forming a guide to those which would seem to be necessary in the case of the Nova Scotia fields.

The provisions contained in the Nova Scotia Mines Act were, I understand, drawn up about the year 1877 by Mr. H. S. Poole, then Chief Inspector of Mines. They appear to have remained unaltered (except for one variation on a matter of detail) since that time. In the report of the Department of Mines for the year 1877 Mr. Poole discussed at some length the question of submarine mining in Nova Scotia. The information contained in this report has proved of great interest and value to me, throwing light as it does on the nature of the evidence on which Mr. Poole founded the regulations, and the opinions which were held at that date by various persons interested in undersea mining. I would point out that the thirty years which have since elapsed have provided a large amount of additional experience attended by, in some respects, a change of views.

I will now proceed to remark in detail on the various provisions contained in the Act:

54. (1) (a) Provides that no undersea workings shall be carried on at a less depth than 180 feet of solid cover, but gives power to the lessee to drive passage ways for the purpose of winning the deposit only, under a cover of not less than 100 feet.

Although it is true that, both in this country and in New South Wales, workings have been carried on successfully, under special precautions, at less depths than 180 feet, I am of opinion that having regard to the general nature of the beds overlying the seams in the various districts adjoining the seaboard in Nova Scotia, it would not be advisable to alter this regulation. It must always be a difficult, if not an impractical task, to ascertain the exact thickness of the "solid measures," and I think therefore that a considerable margin of safety should be provided. In the case of passage ways to be driven under a less depth than 180 feet of solid cover, I assume that, if it should be thought necessary and judicious to reduce the 100 feet limit in any particular instance, the Commissioner could, under sub-section 2, sanction such a proceeding.

(b) Provides that "a barrier of not less than 50 yards, 25 yards on both sides of the boundary lines of every lease, shall be left unwrought between the workings of each submarine seam."

Section 208 of "The Mines Act" 1892, in which I presume that the term "land covered with water" includes submarine areas, provides that a barrier of 25 yards is to be left "within and along each of the boundary lines" of any submarine lease. This is in effect the same as the regulation quoted above, but, I think, expresses the nature of the reservation more clearly, and I would suggest that it might possibly be advisable to alter the clause in the Mines Regulation Act so as to make it correspond with that in the Mines Act.

It may happen, I think, that with deeper mining or under special circumstances, wider barriers may be required, so that it seems to be a matter for consideration whether power should not be given to the Commissioner to require such extensions, if considered necessary.

(c) Provides that, where there is less than 500 feet of solid cover over the seam worked, the workings shall be laid out in districts of an area not greater than half a square mile, each district being enclosed by a barrier not less than 30 yards in thickness, which shall not be pierced by more than four passage ways of a sectional area not greater than 9 feet wide by 6 feet high, with a modification to the effect that the inspector may, if he thinks it necessary, permit the cross section of the passage way to be increased to 60 square feet.

(d) Restricts the length of any district when parallel to the general trend of the adjoining shore line, to one mile.

(e) Requires the submission to the inspector of any proposed system of working, and his approval of the same before work is commenced, as well as his sanction to any change being made in the approved system.

(f) Provides that the opening of a new lift or level in a mine already working shall be deemed the commencement of a new winning within the meaning of the section.

I have thought it better to consider the above regulations together, as they seem to comprise those which relate expressly to the methods under which the coal is to be worked or points in connection therewith.

The first two provide for the application between the lines of 180 and 500 feet of cover, of a system which is generally known as the "panel system." Under this the area to be worked is divided into districts or "panels" surrounded by barriers through which as few holdings as may be considered absolutely necessary are made. The dimensions of these places are restricted so as to enable dams to be placed in them in case of any inburst of water occurring in the panel in which they lead, with the object of shutting off the district and preventing a general flooding of the workings. This system has been practised to a considerable extent in this country in the case of workings at moderate depth, but I think that experience has shewn that, while it presents many disadvantages, it offers in reality little, if any, real security. The restrictions as to the number and dimensions of the places communicating with the panels cause great inconvenience both in the matter of haulage and ventilation, while the loss of coal due to the barriers left is considerable. On the other hand, it is very seldom that the conditions of the strata surrounding the drifts are such as to render any prospect of dams, likely to be of an effective nature, being capable of being erected. Under these circumstances—and they are such as I consider apply in the same way in Nova Scotia as here—I do not think that any importance can be attached to this method of working, but that it is better to rely on the pillars left for the support of the roof being properly proportioned with a fair margin of safety and a careful restriction of the width of the working places and disposition of the same.

I am of opinion, therefore, that no advantage can be obtained by the retention of these provisions, and that their elimination from the regulations would not lessen the security of the mines, while it would, on the other hand, lead to a saving of coal and give improved facilities for working. Under the regulations the system of working below the 500 feet line is unfettered, though subject to the approval of the inspector. I think that the same condition should apply wholly, as it already does in

part, to operations carried on between the 180 to 500 feet lines, or, in other words, that the system of working should be entirely under the inspector's control, as it appears evident that, in any case, some controlling authority must eventually take the responsibility of regulating workings of this description. I am strongly of opinion that the conduct of undersea workings cannot, generally speaking, be advantageously provided for by hard and fast rules, and that a careful consideration of the circumstances of each case, guided by experience gained in the gradual development of operations, is the proper system to be pursued in such cases.

As to matters of detail I would make the following suggestions:

1. In clause (e) I think that it should be provided that the approval of the inspector in the first instance should, as in the case of any alteration, be in writing.

2. I am of opinion that provision should be made, either in the Mines Regulation Act or in the leases, that, where any workings are carried on upon the long-wall system, an exploring drift shall be driven fifty yards at least in a seaward direction in advance of such workings so as to prove the existence of any faults or dislocations, until it reaches the barrier required to be left.

3. I think that surveys and levellings of undersea workings should be made every three months, and that the levels together with the depth of cover should be marked upon the working plans at specified distances along the lines of all main roads and round the faces of all workings approaching the 180 feet line of cover. Soundings should also be taken at reasonable distances and recorded on the plans.

I trust that you will let me know if there are any points on which you require further information or explanation, in which case I shall be very pleased to do my best to afford it.

Yours faithfully,
(Sgd.) T. E. FORSTER
Newcastle-on-Tyne, October 22nd, 1908.

HIRAM DONKIN, ESQ.

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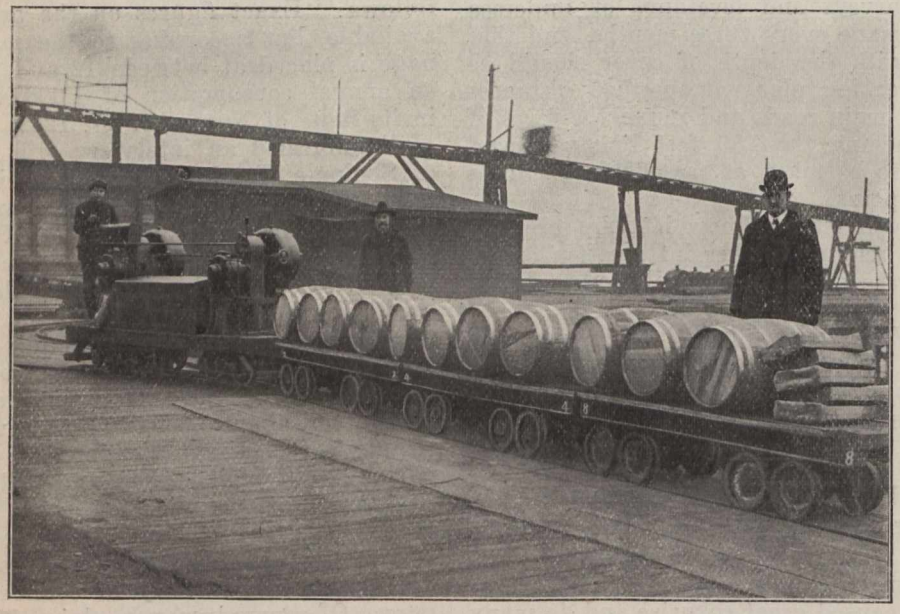
## GRANBY MINES, BOUNDARY DISTRICT.

The publication of a statement to the effect that the ore reserves of the Granby Mines, in Phoenix camp, Boundary district, are within measureable distance of being exhausted has caused great surprise and, to many stockholders, much monetary loss. Whether there is or is not good reason to believe that mines heretofore regarded as having an abundance of ore, sufficient to supply the company's reduction works at full capacity for a much longer period than can be done if there prove to be only six million tons of ore available, as now stated, is a question that can only be determined by fully qualified mining engineers and that after a most exhaustive examination of the property. There are some circumstances, though, which would appear to make it quite reasonable to ask whether the directors of the company and their late local manager are in any way to blame for the present disastrous situation. At this time it may be of interest to point out that the management of the Granby Company has not at any time, so far as has come to my notice, made public information that would throw doubt on the general belief that the reserves of ore in the company's mines were not large and equal to all demands likely to be made upon them for a longer period than it is now suggested they will last at present rate of production. Without going back to the very optimistic assertions that some years ago were occasionally made, attributing to the Granby Company possession of mines which with an output of one million tons a year had ore enough to last at least one generation and probably two, it is reasonable to ask how far statements made within the two years last past were or are dependable. For instance, Mr. A. B. W. Hodges, until quite recently local manager of the company, stated at a meeting of the Canadian Mining Institute, held in Parliament Buildings, Victoria, in September, 1908, on which occasion there were present a number of influential mining engineers and geologists from Great Britain, continental Europe and Eastern Canada, that "from 10,000,000 to 30,000,000 tons of these low-grade ores are in sight in the Boundary district." Again, he said: "We have in one of our mines 10,000,000 tons of good ore." In the "Souvenir Number" of the Canadian Mining Institute Quarterly Bulletin, Mr. H. Mortimer Lamb, secretary of the Institute, when describing the visit to the Granby mines, wrote: "There is said to be approximately 20,000,000 tons of ore in sight." Last August a New York firm, which makes it a practice to send out "information obtained from what we regard as reliable sources, and believe to be accurate," advised its clients and others as to the Granby Company's ore reserves, as follows: "Exact figures on the ore reserves are not available, but according to the management the tonnage is placed at between 12 and 15 years' supply on an annual consumption of 1,000,000 tons." Further, in its issue of November 27, 1909, the Phoenix "Pioneer" published an interview with Col. N. E. Linsley, of Spokane, Wash., whom it credited with saying, in part: "About March 26, 1898, I made the first report on the Old Ironsides for Mr. Jay P. Graves. Then, on February 12, 1903, I made a complete report on the properties of the Granby Consolidated Mining, Smelting & Power Company, Limited. At this time the Granby was a going concern, mining and treating 1,600 tons of ore daily, with 8,500,000 tons of workable ore blocked out and 14,000,000 tons more reasonably in sight. Altogether, about 5,000,000 tons have been mined at the Granby's Phoenix properties and treated at the company's smeltery since then, and still at the present time, from a cursory examination, there is more ore in sight than there was then." These and other statements to a like effect have been permitted to go uncontradicted by anyone in authority in connection with the company. Of course it may be claimed by the directors and officers of the company that it is not incumbent on them to contradict statements published without their authority, but even if this be so there are other circumstances, and for which they are responsible, that have given stockholders and the public generally a feeling of security. For instance, the expenditure on constructive account during the past two years of a sum stated to have been about $250,000, and the recent issue of 13,500 shares of treasury stock at $85 were surely intended to give stockholders the impression that the company might be expected to have before it a long life of profitable operation. Perhaps, after all, this impression is warranted by actual conditions. It is not well to take it for granted that the recent panic and consequent heavy fall in the market price of shares in the company was fully warranted. Until assured on thoroughly reliable testimony that there really is reason for serious concern as to the future, prudence suggests that the statements of Messrs. Jay P. Graves, vice-president and general manager, and W. Yolen Williams, consulting engineer, be given due consideration. A published telegram from Mr. Graves says: "I have not

visited the mine personally for about 18 months, but according to our employees there has been no change in the mine during that time for better or worse," while to Mr. Williams is attributed the following assertion: "No important developments of any kind have taken place in the mine for two or three years. I mean by that that no new knowledge has been gained as to the extent or limit of the ore bodies." Mr. Yolen Williams directed the opening of the mine during eight years, 1896-1904, so that he was fully informed as to conditions prior to relinquishing the active oversight of development work. Whether the extraction of about five million tons of ore since Mr. Hodges took charge of the mine exhausted all the reserves of which Mr. Williams knew, is not apparent, but there is this fact to be kept in mind—Mr. Williams has a high reputation for long experience as a practical miner, for undoubted ability as a mine manager, and for strict integrity as a man, so that if he shall have carefully examined the mines lately, his judgment and opinions should have respect until such time as there shall be adequate evidence to prove him wrong. Incidentally, it may be mentioned that the aggregate tonnage of ore extracted from the Granby mines to date is about 6,045,000 tons, of which quantity about 1,650,000 tons have been produced since September, 1908. If Mr. Hodges was justified in then claiming that IN ONE of the company's mines there was "10,000,000 tons of good ore," it is plainly evident that there should remain considerably more than 6,000,000 tons IN ALL of the Granby mines. The official explanation of the situation by the directors is being anxiously awaited, and if this shall not be clear and satisfactory it would seem that there should be close enquiry into all the conditions, and an exhaustive examination of the mines by independent and competent engineers.

# Storage Battery Electric Locomotives Handling Copper Ore.

BY FRANK C. PERKINS.



The accompanying illustration shows a novel type of electric storage battery locomotive designed for industrial service handling copper ore and ingots at Constable Hook, N.J., for the Oxford Copper Company.

There are many situations where the trolley type of electric locomotive is undesirable on account of the appearance of an overhead trolley wire system. In many cases the fire risk is also serious through the sparking of the trolley, this risk being eliminated when a storage battery locomotive is utilized. As it is able to take curves of 12 feet radius, every part of the work is made accessible by this type of locomotive, even where the buildings are irregularly placed and close together.

The motors are of the enclosed type and the storage batteries require no attention during working hours, while it is maintained that the cost of operation for haulage is far less than with animal power. The narrow gauge locomotive weighs 4 tons and is designed for a track having a gauge of 21 1-2 inches. This storage battery locomotive measures 70 inches high and 56 inches wide over all, the total length being 12 feet. Only when the locomotive is in service is electric power used, all cost for electric current ceasing when the controller handle is thrown to the off position.

There are two independent electric motors employed which are connected in series or in parallel, allowing a speed of from one to four miles per hour. At low speeds the motors give a great starting effort with a minimum consumption of electric current and the storage batteries have a capacity such as to give a range of action for the locomotive of ten hours in ordinary service. This narrow gauge electric storage battery locomotive will haul 50 tons on a level and 25 tons on the one per cent. grade, while on a two per cent. grade it will handle 15 tons without difficulty. The capacity decreases from ten tons to seven tons and five tons respectively on grades of three per cent., four per cent. and five per cent. A direct current of 110 volts or 120 volts is used for charging the storage battery at regular intervals. The system of charging is so thoroughly safeguarded and simple that any careful workman can be entrusted with this work without technical knowledge.

# A Discussion of Leopoldo Salazar's Paper on the McArthur-Forrest Cyanide Patents in Mexico; and the Lessons to be learnt from the History of this Subject.

BY JOHN MALCOLM NICOL.

(Proceedings of the Mexican Institute of Mining and Metallurgy.)

Mr. Salazar's very interesting paper on the McArthur-Forrest Cyanide Patents, raises a number of questions of the whole subject of Patent Law, and before I can attempt to answer some of the questions which he propounds, or discuss the problems which are brought to light by the historical part of his paper, I think it will be advisable to give clear definitions regarding patent law and inventions.

As I understand it, the first purpose of the patent law, based on the human sense of justice to "Render unto Caesar that which is Caesar's," is to insure that society gives to an inventor a just and fair reward for the benefits which his inventions give to society.

The second object is to develop a stimulus which will tend to make more men take up the drudgery, and heavy mental strain, of solving the problems that are continually arising from the ever-growing demands of the industrialism of modern civilization: this stimulus being the commercial reward resulting from the ownership of a valuable patent.

It is only just beginning to dawn on legislators that the industries and manufacture resulting from modern inventions are of great economic value to commerce, and national income, and hence the third object of the patent laws of a nation may well be, to not only concentrate within her territory men of brains and intellect, but to obtain a share of the wealth resulting from the manufacture of their inventions, and with this object in view the new English patent law requires that a regular manufactury be established for the production of a patented article or else the patent becomes null and void after a few years.

The next definition that we require, is one that will give us a clear understanding of the words, discovery, research, invention, and design, in the sense in which they should be used in relation to the patent law.

I feel and I think, that many of our learned friends present will agree that a new word is needed in the English language to define the difference between a "chance discovery" and a "discovery" that has been made, by definite research work, leading up to some phenomena, or substance whose existence was deduced but whose qualities were unknown.

I therefore take the liberty of coining a word to designate a discovery which is the result of deliberate research: let us call it a "pruvery" and reserve "discovery" far chance finds. These two words have their principal application to the natural phenomena of physics and processes based thereon.

The former class of discovery is interesting and may be invaluable to humanity, but deserves reward only in relation to the associated work of the discoverer; the latter class is evidence of the finest type of intelligence of the human race; and although the "pruvery" may only be of scientific value and industrially worthless, yet it is worthy of the highest honours and reward that humanity can confer on the demonstrator, as it leads to unknown potentialities in the development of human intellect.

As examples bearing on the question of patent law I will cite the following:—Edison's chance "discovery" of the phonograph, and Ramsey and Raleighs' "pruvery" of Argon. Edison was working with a German assistant in his laboratory, experimenting with an instrument for recording the vibrations of a musical note. He had constructed one with a wax-coated cylinder driven by a small electric motor. By chance the assistant reversed the drive, and the impression on the wax cylinder passing under the disc reproduced the notes. The German, with Teutonic bluntness, said, "my God, she speaks." Thus Edison discovered by pure chance the phonograph. He subsequently "invented" the needles, discs, etc., and "designed" the mechanism as a whole, which made the phonograph a commercial success.

The discovery of the phonograph resulted in a valuable patent, which gave great reward to the owner, and yet the discovery in itself deserved little credit, and, while it is of occasional use commercially, it is otherwise merely a toy.

The "pruvery" of Argon could not be patented and had no commercial value, and as far as I am aware, brought no financial reward to Ramsey or Raleigh, and yet the demonstration of the existence was the result of patient mental effort, and was of great value to the intellectual development of the human race, because it was an infallible proof of the absolute accuracy and reliability of our modern scientific methods of deductive reasoning.

An "invention" consists of finding a means of applying a process to an industrial use, or of planning an apparatus for the working of a process. An "invention" must in every case be an original idea which has never been executed, or a combination of known "ideas" in such a novel form, or for such original purpose, that it virtually forms a concrete conception in itself.

A "design" in mechanics consists of grouping together known principles, and designs, to produce a required effect. The border line between "discovery," "pruvery," "invention" and "design" is interlaced by each, and perfect definitions are difficult and I know that those that I have given are far from complete but they will serve my purpose for the present.

The field is now clear for me to discuss the questions and problems of Mr. Salazar's paper.

First, the discovery or "pruvery" of Hagen in 1806 revealed a chemical phenomenon; the action of cyanogen on gold. It was not in any sense an invention. Even the work of Simpson in 1885, for which a patent was granted, barely merits the title of invention, and with regard to Mr. Salaza's fundamental question, "can a process be considered as new when it has been proposed but has never been put in practice with industrial ends in view?" I would emphatically state that the application for industrial ends bears no relationship to its claims for novelty. A process that has been once proposed or demonstrated is not new. A man who takes a known and demonstrated process and applies it may be doing a very meritorious act, and may demonstrate an industrial utility that was unknown before, but he is not an inventor, and should not be granted a patent. We must find other means of rewarding him. Neither

can the "amount of dilution" of a chemical process be considered ground for a patent, for the amount of dilution is a variable function, known to be common practice to all forms of chemical processes. On this point I heartily agree with Mr. Salazar when he states "that the restriction is unscientific in principle."

In the case of the McArthur-Forrest patents, it seems clear on the basis of the above argument that they did not make any invention at all. They merely designed plants which made possible the application of known chemical phenomena to industrial purposes.

They may have invented numerous mechanical details for apparatus to carry out the above process, but these had no relation to the patents which were granted.

It therefore seems that if patents are to be allowed only for novelty and invention, that a patent should not have been granted, and yet there is no question but that the early success of the cyanide process, and the resultant position of the industry, was primarily and largely due to the ideas, the brains, energy and courage of the McArthur-Forrest combination.

Ethically, then, the patents should not have been granted, and yet if it had not been for the assumed guarantee of a monopoly resulting from these patents, the capital might never have been invested, and the experiments and working tests made, which have resulted in world-wide benefits from the modern cyanide process.

On the general principle that it "pays a nation" to stimulate brain energy, and to assure a suitable and just reward to the intrepid investigator, experimenter, and demonstrator, it would seem that a law is needed that could grant a monopoly that is not a patent, and not a concession for just such cases as these; and as the granting of such a monopoly would have to be certain and independent of reversal by the courts, it is evident that "a priori" search would be necessary.

It seems, therefore, that four distinct evidences of human intelligent effort have to be dealt with in relation to the patent law.

First: The scientific research worker, whose discoveries or "pruveries" either directly or indirectly are of inestimable value to human industry; yet little, if any of their work is subject to protection and reward by patent, their only recognition being that of scientific societies, who give gold medals, and occasional prizes.

Second: The recognized body of inventors, men who seeing the demand for a machine or process to meet an industrial requirement, "invent" a novel "method" for the solution of the same. These are more or less protected and encouraged by the various existing patent laws.

Third: Those who, by the aggregation of known principles and by the perfection of plant design and careful test and demonstration, create new industries from known, but untried, or half developed processes. These men are probably one of the most valuable assets that a nation can have, and yet they have never been recognized as a body, and no legislature has ever attempted to create laws which would in justice protect and stimulate this class of human endeavour.

Men under this heading frequently try patenting some trivial part or adjunct, a procedure which is generally a failure.

Fourth: We have the purely commercial type of man who undertakes to establish a well-known process, or recognized industry, in a new locality where commercial success, and financial reward, are uncertain, but where the establishment of the industry is of great national economic importance. This man is amply protected by the granting of concessions which give him an exclusive monopoly as a reward for his endeavours and the risks he takes.

I only draw attention to this fourth class for the simple reason that it might be supposed that such cases as McArthur-Forrest, failing to obtain adequate protection from patents, might obtain reward for the speculative investment in experiments and demonstrations by this means; but for reasons which will be self-evident from my further arguments, it will be seen that a separate law is really required to meet the cases under the third heading.

Of course the work of each of these groups is co-related and merges insensibly one into the other. But I think that my definition and meaning is sufficiently clear, and will be generally accepted. The first, second and fourth, I know, are generally accepted, and to make my statements regarding the third class clearer I will name some typical examples: (1) The application of the cyanide process to metallurgy. (2) The development of step-reduction, crushing and trituration as a process. (3) The perfection of the mechanics and dynamics of the cyanide process. This latter is a particularly interesting example, as although numerous patents have been taken out there is hardly one of them which is "ethically" valid, and yet the mining world is reaping a rich harvest from the work of many men who have devoted much time and study to the application of known principles and to the perfection of design. Under this head I include the various vacuum filters and air agitation tanks, classifiers, pulp thickeners, etc. (4) The application of dredging to gold placer mining, etc.

Against this list, which could be continued almost indefinitely, we find that in some cases the patent law grants sweeping monopolies for veritable "tricks of wit," which enables the holders to really hinder industry and to reap a rich and undeserved reward. The best example I know of this was the basic combination patent on automobiles, granted in the United States.

It appears to me that one of the lessons to be learnt from Mr. Salazar's paper is the necessity of being able to properly classify the nature of the work that has been done by a so-called "inventor" when he presents an application for a patent. To quote, Mr. Salazar says: "When a process which, on account of its lack of novelty, has everywhere been pronounced faulty in the eye of the law, nevertheless works such an extraordinary revolution in an industry, it is reasonable to suppose that there are circumstances which have escaped the legal mind, and these circumstances are in my opinion, of a purely industrial character, and should, therefore, be defined by those engaged in the industry."

I beg to disagree with Mr. Salazar. I do not think the circumstances are purely industrial. It appears to me that the legal mind has overlooked the difference in status between the classes 1, 2, 3 and 4 which I have enumerated. The function of the law in these cases is to insure to a man the enjoyment of something that is his, and for this reason it is ethically doubtful if the patent law should force a man to manufacture something that is even more essentially his own than the possession of land. Or that it has the right to dispossess him of a monopoly once granted any more than it has the right to dispossess a man of the title to land. In fact, the latter procedure, which is not practised for the public good, except in exceptional cases, is more logical and just than the former, which is recognized and prac-

tised by all nations. But then land owners and not engineers, were the framers of our laws.

Here, then, are the problems which are brought to light by Mr. Salazar's paper and by my discussion:

(a) How many classes or divisions of the inventor's work (in the broadest sense) do we have to consider? (b) What specific thing is presented by each class that can be considered as deserving of judicial recognition and legal protection? (c) To what extent and for what period are we to grant monopoly (if any) for the purpose of reward and stimulus of each class? (d) How can we give to individuals right and title to monopolies without interfering with the possible future rights of another individual or the community at large? (e) How can monopolies be given which will stimulate without retarding industry, and thereby be of national benefit?

Mr. Salazar implies that he would welcome not only discussion, but suggestions, and I will therefore take the liberty of attempting to give some answers to the above. But in doing so I will assume that the tendency of the modern law maker is to consider the welfare and interests of the majority before the right and title to monopoly of the individual, and will therefore postulate that the purpose of the patent law is only to grant sufficient monopoly to stimulate and reward endeavour and to regulate the relationship between the owners of patent monopolies and the general public.

We then have to consider the best method of dealing legally with: First, Research workers or pure scientists; second, inventors proper; third, designers and demonstrators; fourth, industrial organizers.

Dealing with the first class, the men who devote their lives to this work as a rule are jealous of honour, but care little for financial reward. They only need money as a means to an end. The type, while being commercially inefficient, is yet of immense value to commerce. Therefore, commerce, industry, and especially monopolies resulting from patents, should be directly taxed for the support of scientific institutions, and the necessary research workers.

Dealing with the second class, it seems only logical that every assistance should be given to the inventor, so as to stimulate him to endeavour, and with this end in view the cost of patenting should be made very low, and means of registering a provisional patent should be provided. A well-equipped institution with every facility for research on former and expired patents should be provided, the costs to be maintained from a tax on successful patent monopolies, and not from the patent fees. In fact, I believe registration should be preferably free. The inventor naturally wishes to obtain by his patent a monopoly which has a commercial value. Therefore a patent once granted should be final, and not subject to reversal by the court, except for proven theft of ideas, or fraud. This necessitates "a priori" research of a very thorough nature.

Nearly every invention is the forerunner of others, and numerous improvements immediately follow. It is, therefore, very necessary to grant a monopoly on such lines that it does not hinder industry or prevent other inventors from manufacturing their improvements. The general public the world over are failing to derive benefits from numerous valuable inventions and discoveries which are lying idle, and locked up, being held to protect some industrial monopoly which is operating inventions of an earlier date.

Bearing this in mind, I would suggest that any person might manufacture, or sell an invention once patented and published, or incorporate another man's patented invention with improvements of his own, without the permission of the inventor, providing only he makes application to the patent office and pays a royalty to the inventor.

All royalties would be based on a percentage of the sale value of the machine, subject to law, and not upon the whim or fancy of the owner of the patent. The effect of this would be to protect and encourage inventors and to prevent financial interests holding idle patents for industrial ends to the detriment of the public welfare.

Any experimentor might write articles or publish or discuss data regarding his experiments or build experimental machines, apparatus or processes, without invalidating his rights to apply for patent protection, providing he makes application within two years.

The publication of data under his name being taken as proof of the genuineness of the invention being his. No royalties can be claimed while a patent is pending and until it has been finally granted.

Provisional patent applications could be amended during the period for which they are granted. Final application would be unalterable, except at the recommendation of the patent authorities. Inventions might be roughly classed as follows: (1) Basic; (2) combination; (3) secondary, i.e., improvement following original ideas; and (4) transfer, the latter being the transferring and adapting of idea from one industry to another.

When search, made by the patent office, shows that an idea brought forward by a person claiming invention is not novel, but has been known of in some form or another before, but has never been actively made use of, owing to the fact that no one has been found who has the courage and energy to test, prove and demonstrate it, a patent should be denied; but a monopoly of another form might be granted, carrying with it the necessity of establishing a demonstration on an industrial scale, and, if shown that it was an improvement in the art and a benefit to industry, the right to collect from others a royalty on a very moderate percentage basis (to be fixed by the patent office), should be allowed. This would cover the third class, and just such cases as the McArthur-Forrest, and at the same time would not be in the nature of an absolute monopoly and a restriction to future trade, such as often results from the granting of exclusive concessions under the fourth class.

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**The Mining Magazine, March, 1910.**—In a leading editorial the Mining Magazine, while speaking in highly respectful terms of the officers and members of the Mining and Metallurgical Society of America, argues that since this organization has a membership of only 160, it has little right to speak for the thousands of engineers, metallurgists, and geologists of America. It is characterized, so in effect continues the Mining Magazine, by a spirit of false exclusiveness. "The attempt of a fortuitous aggregation of individuals to sit in judgment on the members of a profession that includes thousands of men of varying education and occupation has failed utterly." The generous policy of the American Institute of Mining Engineers is, in our contemporary's opinion, much the better of the two.

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During 1909 the Rio Tinto Copper Company paid dividends at the rate of 60 per cent. net. The rate for 1908 was 55 per cent. net.

# ZINC MINING IN BRITISH COLUMBIA.

The recent authorization by the Canadian Parliament of an expenditure of $50,000 in investigation by the Dominion Department of Mines of processes for the reduction of zinc ores and making experiments in connection therewith, recalls the fact that the question of how the zinc ores of British Columbia can be turned to profitable account has had the attention of owners of mines in the Slocan district, in which zinc occurs in quantity, from time to time during the past six years, and to a smaller extent for a longer time.

### Investigation of Zinc Resources.

Early in 1904 an organization, consisting chiefly of owners and managers of silver-lead-zinc mines situated in Slocan district, known as the Associated Silver-Lead Mines of British Columbia, instructed its special committee to memorialize the Dominion Government to engage a high authority on zinc and its treatment to investigate and report on the zinc ores of the Kootenay district. This proposal was endorsed by the Associated Boards of Trade of Eastern British Columbia. In connection with this movement, Mr. A. C. Garde, then resident manager for the Payne Consolidated Mining Co. owning the Payne mine, near Sandon, Slocan district, prepared and published a statement outlining the benefits to be derived from fully investigating the zinc resources of British Columbia as to their extent, value, character, etc., and giving much information relative to the occurrence of zinc in association with silver-lead ores in mines in Slocan district and, incidentally, a brief summary of places elsewhere in the province at which zinc-bearing ores had been found.

In the course of his review, which was a lengthy one, Mr. Garde gave the following information: During ten years to that date zinc ore had been known to occur in British Columbia, especially in districts where silver-lead mining had been carried on, but only in 1903 had much attention been paid to their economic features. The presence of zinc in excess of the smelter's limit of ten per cent. had involved the ore being penalized by the smelters at a rate of 50 cents per unit. It had been found in a number of Slocan mines that lead in large measure gave place to zinc, or that the two metals were so intermixed that separate processes for their recovery, respectively, had had to be adopted. This led to the finding of a market for zinc, much of which had previously been run to waste when concentrating the silver-lead ores. Many difficulties still confronted the mine-owners; some ores were of a complex nature, some had low values in silver, or there were obstacles to effective concentration and in the high cost of transportation. The establishment of zinc reduction works was, therefore, an evident condition to the profitable working of the mines in which lead-zinc ores occurred in quantity. But capitalists would not expend money in erecting and equipping local reduction works until they had been satisfied that the character and extent of the available zinc ores would warrant them in doing so; hence the urgent necessity for a full investigation by a competent authority of the zinc resources of the province, and the conditions attending their utilization. That such an investigation would result favourably there was little doubt, for it was known the zinc resources were extensive. The resultant benefits would not be restricted to zinc mining, for it was believed that in exploring for zinc ores large bodies of lead ores would also be discovered, the two metals occurring in the province in close association.

The varying physical features of the zinc ores of the different districts puzzled both the miner and the metallurgist in one respect, namely, that of the wide difference in the value of their silver contents, some ores carrying only about 6 oz. per ton while others ran high in silver. Within a radius of ten miles of Sandon, though, the average silver content of zinc ores, was estimated at about 25 oz. per ton of 50 per cent. ore. Emphasis was placed on that fact, for the reason that the prevailing opinion was that Slocan ores contained a far higher average in silver, and that until such time as the smelters should be able to pay for more than three-fourths of the silver it would be better to leave in the mines ores running high in that metal, looking to the recovery of a higher percentage of it being eventually made practicable.

An important consideration brought out was that, apart from their silver contents, the zinc ores of British Columbia were worth mining for only the zinc in them. It was believed that there exists in the province an unlimited quantity of zinc ore, suitable for both spelter and zinc oxide production. The zinc mining industry, therefore, should not be hampered by the fact that highly argentiferous zinc ores also occur. These should be regarded as exceptions to the rule and should not be permitted to interfere with the utilization of the large deposits of strictly zinc-bearing ore workable for their zinc contents only. One of the chief objects in view in persistently inviting public attention to the zinc ore deposits of British Columbia was to secure a general realization of their extent and considerable value. Zinc smelters in both the United States and Europe had already awakened to the potentialities of the zinc industry of the province, and as a result zinc ores were being exported to foreign countries to be manufactured into spelter and zinc oxide. That meant that Canada first paid freight on the raw material taken out of the country and afterwards paid freight and duty on the manufactured zinc products it imported. It was estimated that Canada in that way paid more than two cents per pound on all spelter it used and proportionately on other zinc finished products. Heavy losses had been incurred in the large quantity of zinc, together with the silver in it, run to waste in concentrating silver lead ores, the tailing from a dozen 100-ton concentrators assaying from 20 to 30 per cent. zinc, and in the penalties paid the smelters for the excess percentage of zinc in the lead ores marketed. But the position had become much changed, for while it was developing that to a considerable extent zinc was replacing lead at depth in important mines, methods for the recovery of zinc were being steadily improved and—an important consideration—spelter commanded a higher price than did lead. Peculiar and extraordinary conditions had caused the advantages and prospects of the zinc-mining industry to be overlooked, but it was being realized that there was a promising future for zinc in British Columbia, and that it would add a new and distinct branch to the mining industry of the province.

### Commission to Investigate Zinc Resources.

As a result of the representations made from British Columbia, the Dominion Government in the summer of 1905 appointed W. R. Ingalls, of New York, "to

make an investigation of the zinc resources of British Columbia and their commercial possibilities." It also designated Philip Argall, of Denver, Colo., and A. C. Garde, of Sandon, B. C., as his assistants, the former to have charge of the field work and the latter to assist him. Henry F. Wood, of Denver, was appointed to investigate the adaptability of the ores of British Columbia to magnetic and electrostatic concentration, etc., Mr. Ingalls was directed to make a tour of the zinc districts of British Columbia after the field work should be sufficiently advanced, to obtain such personal view of the economic conditions as would enable him to form a sound judgment regarding the establishment of zinc smelters, fuel supply and strategical railway locations and such other data as would be necessary for arriving at proper conclusions affecting the development of the zinc industry of British Columbia.

The report contained between 300 and 400 pages and was freely illustrated. In the introductory chapter Mr. Ingalls dealt with the history of zinc mining and smelting in the West, statistics of production, character of the ores, markets for ores, valuation of zinc ores, cost of smelting, value of argentiferous blende, and wet processes of zinc extraction. Other chapters gave much detailed information relative to the zinc mines and the undeveloped zinc resources of British Columbia, methods for concentration, assaying, etc.

**Dominion Government to Conduct Experiments.**

No considerable progress towards placing the zinc-mining industry on a permanent basis in British Columbia has yet been made. Much money was spent by one company operating mines in the Ainsworth and Slocan mining divisions in the erection and equipment of works designed to produce spelter, but commercially these were a failure. Other works were afterwards built and equipped, these for the treatment of complex lead-zinc ores by electro-thermic energy, but here again results were unsatisfactory and operations were not continued. Meanwhile a duty was placed on zinc ores entering the United States, so those interested in the mines in Ainsworth and Slocan districts held a meeting at Nelson, B.C., last December, and thereafter petitioned the Dominion Government to take the steps necessary to establish a smelting plant capable of treating Canadian zinc ores and of producing manufactured products of zinc, at least to the extent of supplying the Canadian market for the same. Especially it was asked that the Dominion Department of Mines be authorized to take up the matter and conduct experimental work upon such a scale as will determine definitely the practicability of the economical treatment of zinc ores by electro-thermic or electro-chemical process.

On March 21, Hon. Wm. Templeman, minister of mines for Canada, introduced in the House of Commons a resolution providing for the expenditure of $50,000 for the purpose of investigating the processes in use in the production of zinc, and for experiments in the manufacture of spelter and other zinc products from Canadian zinc ores. It is understood the experiments will be made at Nelson B.C., probably at the works in existence there and at which much experimental work has already been done.

In conclusion, it may be mentioned that last year zinc ore and concentrates containing about 11,000.000 lbs. of spelter were shipped from mines in Ainsworth and Slocan divisions. Lucky Jim mine shipped to the United States about 5000 tons or ore averaging about 52 per cent. zinc, while the Whitewater, Ruth, and Van Roi shipped concentrates running about 45 per cent. zinc. Other mines in which it is known zinc occurs in considerable quantity are the Blue Bell, on Kootenay Lake; several mines in Ainsworth camp; the Cork, Province, and Montezuma, on south fork of Kaslo Creek; the Jackson, Antoine, Rambler-Cariboo, and Washington, in McGuigan basin; the Payne, Ivanhoe, Slocan Star, and Richmond-Eureka, near Sandon; several mines near Cody; Monitor and Idaho-Memo, at Three-Forks; Mountain Chief and Bosun, near New Denver; Emily-Edith, Standard, Wakefield, Hewitt, and Galena Farm, in Silverton camp; Enterprise, on Ten-Mile Creek, Slocan Lake; and numerous smaller mines. There is a large deposit of zinc ore in the Arrow Lake division, now being opened by New York men; much zinc in the Monarch mine, near Field, on the Canadian Pacific main line railway; and known undeveloped occurrences of zinc ore in Lynn Creek camp, near Vancouver; at the Britannia mine, on Howe Sound; in the Quatsino Sound district, Vancouver Island, and in other places in the British Columbia coast district.

*Report of the Commission appointed to investigate the zinc resources of B.C. and the conditions affecting their exploitation. 1906, Mines Branch, Dept. of the Interior, Ottawa.

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From the smoke pollution investigation that has been in progress for a number of years at Leeds, England, it appears that the solid impurities in the air at the industrial centre are 20 times as great as three miles to the north-east. The soot washed down by rain over four square miles in the industrial centre averages 190 tons per square mile per year, or half a ton per square mile per day, and at one station reaches the rate of 300 tons per square mile per year. The waste in unburnt fuel is represented by about 100 tons per square mile per year. The tar deposited with the soot has been estimated to be 24 times greater in town than 9 miles away, and has been shown to be 80 pounds per acre per annum in the centre and only 14 pounds three miles to the northeast, although the proportion is higher in domestic smoke than in industrial smoke. The free acids—sulphuric and sulphurous—in the air at the centre represent an annual deposit of 90 pounds per acre, or 25 or 30 tons per square mile. The solid impurities in the air often reduce daylight one-half, the tarry matter causes the soot to adhere to buildings and vegetation; the sulphurous acid makes town fog irritating when breathed and is very injurious to agriculture, and the chlorides—chiefly common salt—are sufficient in industrial centres to damage plants. The ammonia and other nitrogenous compounds in smoke, on the other hand, have some beneficial action as fertilizers and in neutralizing the acids.

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For the first time on the Rand, mules have been employed for tramming operations underground. This experiment has been made in the Ferreira Deep mine, and it is stated to be successful. There has been considerable opposition in this country to the employment of animals underground, and probably there will also be a similar opposition to their employment in the Transvaal mines.

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The lead smelters of the Broken Hill Proprietary Company, at Port Pirie, South Australia, have a capacity of 80,000 tons of lead per year.

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Asbestos fibre brattice-cloth is being utilized in several Canadian collieries. There is much to commend it.

## ERUPTIVE PRODUCTS.

The products derived from molten magmas can be classified broadly into five groups:—

(1) Normal rocks, plutonic or volcanic.

(2) Ores separated directly from molten material, e.g., nickeliferous pyrrhotite and titaniferous magnetite.

(3) Pegmatites, distinguished in origin from normal igneous rocks by the fact that water has played a more prominent part in their formation.

(4) Mineral veins and certain other mineral deposits, in which water has played a still more important part than in pegmatites.

(5) Products of gaseous or fumarole action (pneumatolitic products).

In this classification the products of eruptive action are confined to those formed beneath the surface of the earth and account is not taken of those originating at the vents of volcanoes.

It is but to be expected, since the five groups of products are so closely associated in origin that types of ore bodies would be found which represent not only each separate class of eruptive product, but various combinations of them. For instance, nickeliferous pyrrhotite and other ores are closely associated with certain rocks, ore grading into rock and vice versa. Cobalt-silver ore deposits furnish a good example of the association of several eruptive products. The diabase so characteristic of the Cobalt area, together with cobalt-silver ores and the aplite or pegmatite of the Elk Lake and Gowganda areas are all considered to have come from one magma. Fissures in the diabase, a rock which can be placed in group (1) of the classification, are occupied by the ores which belong to group (4) and by aplite or pegmatite, group (3). No pneumatolitic products are known to occur in the ore deposits of Cobalt or in the surrounding district. Fluorspar, however, occurs in similar veins of the Port Arthur silver area. Hence it can be said that in the silver areas of Ontario four groups of eruptive products are represented. In the Elk Lake and Gowganda areas ore and pegmatite are so closely associated in certain fissures in the diabase that they can be said to approach closely in origin products of group (2) Practically, therefore, all five eruptive products are represented in Ontario's silver deposits.

W. G. M.

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In spite of the gradual reduction of coal consumed per horse-power per hour from more than 10 pounds to 3-4 pound, the total consumption of fuel is increasing in every civilized country. Cheapening of power costs widens its commercial applications.

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Under the superintendence of Mr. F. Hille, the Laurentian gold mine is to be operated once again. A new company, composed largely of Detroit investors, has secured control of the property. The corporate name is Merger Mines, Limited.

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# LEGAL COLUMN.

### AN OFFICIAL GUARDIAN FOR COMPANIES.

Reference was made in this column some time ago to the sale of shares at a discount, and it was there pointed out that the sale of shares at a discount rendered wholly uncertain the value that the purchaser was getting for his money. The elimination of the right to sell shares at a discount would leave only one loophole for the promoter to escape giving the investor value for his money, namely, the right to exchange properties or considerations other than money for fully paid-up shares in the company. This is a right that exists not only in our own systems of company law, but also in the English and American systems. It was President Taft's proposal some weeks ago to cause all properties taken over by companies to be taken over at a value set by Government appraisers which aroused such alarm on the Stock Exchange. I gathered from the weekly market letters that the foundations of commerce were threatened by the proposal.

This idea, however, is not distinctly new or strange. It has been suggested by authorities not generally regarded as anarchistic. In fact it was only after a series of cases in the English courts that the right was established at all, and the judges there have not always been enthusiastic about its merits.

Lord Justice Vaughan Williams, of the English Court of Appeal, in the case of Moseley vs. Koffy-Fontein Mines, Limited, in 1904, said:

"It was established long ago that the obligation of a "shareholder to pay the full nominal value of his "shares need not be satisfied in money's worth. It has "also been held that the Court will not, if it is satisfied "that there is an honest bargain under which the "money's worth is paid, inquire into the adequacy of "the consideration. These two propositions have been "apprised by the higher tribunal and I am not suggesting for a moment that the cases which established "them were not properly decided, having regard to the "terms of the Companies' Act, 1854, but I hope that "the day may come when it will be gravely considered "by the Legislature whether it is not for the advantage "of the community and particularly of the commercial "community, that an Act should be passed that in all "cases the full nominal value of the shares shall be "paid in cash and nothing else. I am satisfied from "my own judgment and experience in the administration of companies that such a law would have a tendency to benefit the companies themselves and also to "check a great deal of unwholesome speculation on the "Stock Exchange, which is largely fed and supported "by operations undertaken by vendors, promoters and "others for the purpose of unloading fully paid shares "which they have been allowed to satisfy by giving "what is called 'money's worth' instead of making a "cash payment."

Perhaps it should be explained that this is the source of all bonus stocks, stocks issued at a discount (other than mining stocks), and all the other manifestations of watering.

This is a very difficult matter to attack. Unless the practice of issuing shares of mining companies at a discount—a malpractice without either legal or moral justification—these decisions are based on a sound principle of contract law, that people must be at liberty to

make their own bargains, and if they are fools, must pay for their folly, or, as Lord Eldon said, mere inadequacy of consideration, unless it be "so gross as to shock the conscience and amount in itself to conclusive evidence of fraud," is not sufficient to annul a contract.

Now a company is in the eyes of the law a person, able to contract and act within its powers as well as a living person. Being able to contract, it is presumed to be able to protect itself. And so the same principle is applied to the sale of stock for money's worth. Lord Justice Cotton: "The Court will decline to rip up a transaction not impeached as dishonest and not proved to be such, merely because the company may have paid an extravagant price for their property." Vaughan-Williams: "The Court ought to go into the question of whether there is real consideration or whether the consideration is a sham—but in my judgment you can only impeach it in cases where the evidence justifies you in saying that the transaction is a colourable one." Lord Lindley in the same case on appeal:" Shares in limited companies cannot be issued at a discount. By our law payment by a debtor to his creditor of a less sum than is due does not discharge the debt; and this technical doctrine has also been evoked in aid of the law which prevents the shares of a limited company from being issued at a discount. It has, however, never yet been decided that a limited company cannot buy property or pay for services at any price it thinks proper and pay for them in fully paid-up shares. Provided a limited company does so honestly and not colourably, and provided that it has not been so imposed upon as to be entitled to be released from its bargain, it appears to be settled that agreements by limited companies to pay for property or services in paid-up shares are valid and binding on the company's other creditors."

That is to say, the ordinary principles of contract law only are to be applied to such sales of stock. But there are other principles of contract law which should be considered.

A company is presumed to be a person, but is a person entirely under the influence of its directors, and they, in such cases as we are considering, are usually the promoters or the vendors. Thus the company is a person that cannot think or act but as the promoters or vendors will. A contract made with a real person under these circumstances would be absolutely unenforceable and could always be set aside. The person contracting must be as regards the other party "placed in such a position as will enable him to form an entirely free and unfettered judgment independent altogether of any sort of control."

The question is settled, however, as far as the courts are concerned without any regard to any argument about "undue influence." What should the legislature do about it? To require all stock to be paid for in cash hardly seems possible. It is hard to conceive of a workable law to that effect that could not be evaded. To require appraisers to value all the various assets that are turned over, appointing as it were an official guardian to companies, seems to suggest complications and delays that the future hardly promises leisure for. Yet there is a considerable parallel between companies theoretically capable but actually incapable of independent acts, and infants whose bargains the court and the official guardian supervise.

It is not so fantastic an idea. The company is a person with full powers up to a certain limit. Beyond that it is not existent—why not create a borderland of infancy where it can act if the court and its guardian approve? In this borderland we might place the sale of stock for money's worth, the issue of prospectuses, mergers and other dangerous acts that will suggest themselves. More than the mechanical supervision of the government is needed. The machinery is at hand. Why not try using it?

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# BOOK REVIEWS.

## REVIEW OF THE COPPER HANDBOOK, VOL. IX.

The ninth annual edition of the Copper Handbook, edited and published by Horace J. Stevens, Houghton, Michigan, is just to hand. This work, which has become a standard authority on the subject, has, in its latest edition, 1,628 octavo pages, containing considerably more than a million words, and, in addition to the miscellaneous chapters, lists and describes no less than 7,751 copper mines and copper mining companies, in all parts of the world, descriptions ranging from two or three lines in the case of companies that have died recently, to sixteen pages in the case of one of the largest mines—a mine, by the way, that employs some seven thousand men and has paid dividends of considerably more than a hundred million dollars. The mine descriptions are the same as in the preceding volume, except that upwards of eight hundred new titles have been added, covering descriptions not contained in any previous edition. The chapter of statistics, containing upwards of forty tables, treating of copper from almost every conceivable standpoint, has been fully revised and brought as nearly as possible to date.

The miscellaneous chapters of the book, twenty-four in number, treat of the subject of copper from a great variety of viewpoints, including the history, chemistry, mineralogy, metallurgy and uses of the metal, and this section of the book also has chapters devoted to substitutes, alloys, brands and grades, and a copious glossary.

The plan on which the book is sold has remained the same for seven years past, the publisher sending the book by mail, fully prepaid, to any address ordered, without advance payment of any sort, and subject to approval after a week's inspection. The price is $5.00. That this unusually liberal plan has proven successful is shown by the statement of the publisher that net losses through returned copies and defaulted payments are less than four per cent. Anyone interested in the subject of copper, as producer, consumer, or investor, should order a copy of the Copper Handbook.

## PERSONAL AND GENERAL.

Mr. P. N. Nissen has settled temporarily in Toronto.

Mr. C. S. Herzig, of the Constant-Herzig Company, is examining a mining property in West Virginia.

Mr. H. Mortimer-Lamb is to represent the Canadian Mining Institute at the International Mining Congress in Germany.

The Constant-Herzig Company is about to undertake examinations of properties in Utah and Nevada on behalf of London clients.

Mr. James Bartlett has resigned his position on the staff of the Ontario Bureau of Mines and has accepted a billet with the Hosmer Coal Company, Hosmer, B.C.

Mr. A. J. Beaudette, formerly mining engineer for the Dominion Government in the Yukon, has recently visited Sudbury, Cobalt, and Porcupine. Mr. Beaudette will, during the coming summer, make professional examinations in many parts of Canada. It is probable that he will then make Vancouver his headquarters.

Mr. Alexander H. Smith, engineer for A. E. Osler & Company, and other interests in Porcupine, is in Toronto.

Mr. R. B. Lamb, of the C. L. Constant Company, has returned from a professional visit to Nicaragua.

Mr. T. J. Brown, the general superintendent of the Nova Scotia Steel & Coal Company, recently underwent an operation for appendicitis. He is understood to be making good progress towards recovery.

The following paragraph has gone the round of the newspapers:

IN HANDS OF RECEIVERS.

New York, March 28.—The Canadian Consolidated Mining Company, Limited, at 103 Park Avenue, with an authorized capital stock of $5,000,000, a holding company for several coal mining companies in New Brunswick and Nova Scotia, was put into the hands of receivers to-day, as it was unable to raise money to pay its obligations. Judge Greenbaum, of the Superior Court, appointed Daniel P. Hays and David Davis, receivers, with a bond of $75,000, on application of Julius O. Foote, attorney for Luella N. Von Hagen, who is creditor for $19,500 on a note of the company and owns $1,100,000 of the stock.

Hugo Van Hagen was president of the company. The liabilities are $50,000. The company was incorporated under Maine laws in March, 1909, with a capital stock of $5,000,000, of which $4,840,000 has been issued. It owns stock in the following companies: North Shore Railroad Company, Northern Coal Company, Kent Coal Company of New Brunswick; Kent Coal Company, Maine: Crown Coal Company and Great Northern Coal Company, of Nova Scotia, and Maritime Coal Company, of New Brunswick.

The Montreal Star speaks of this as "Another Mine Bubble Burst." It is hardly correct, however, to speak of Von Hagen's companies as "bubbles," because they were frauds pure and simple. We do not remember to have seen any references of late in "Financial Facts" to the dividends of these companies, and Mr. Henry Roach has been strangely quiet of late on the remarkable possibilities of "Kent Coal." It comes to our recollection that this gentleman in advertising the Great Northern Coal Company of Nova Scotia said that future generations would bless the day they heard of Mr. Henry Roach and the wonderful wealth which reposed in the areas of the Great Northern Coal Company, all unknown to the unsophisticated inhabitants of Maccan. It is more than probable that the trusting servant girls and widows who handed their savings to the unspeakable Roach are to-day doing anything but bless that well-named gentleman. The true history of the Canadian Consolidated Mines Company, Limited, would enrich the Newgate Chronicle, and the makers of that history should be allowed to take their ease in Sing Sing or some other classic residence for gentlemen who defraud and embezzle.

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According to Mr. David H. Browne, metallurgist of the Canadian Copper Company, it has heretofore been found impossible to produce by melting copper and nickel together an alloy having the same physical properties as the alloy produced direct from the matte.

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Mr. David H. Browne, in a paper read before the A. I. M. E., at the recent Pittsburg meeting, states that experiments on the conversion of copper-nickel mattes led to the following conclusions:—

1. Nickel is not an element replacing iron in matte.
2. Nickel-copper alloys act in the matte-blow like one metal.
3. Nickel-copper alloys follow, during the matte-blow, exactly the same laws as govern the behaviour of copper alone.

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In 1908, 140 by-product coking ovens were erected in the United States. The number of completed ovens at the end of the year was 4,007. The net gain over the previous year was, however, only 115, as 25 Semet-Solvay ovens at Sharon, Pa., were dismantled.

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The daily production of coal in the Nicola Valley country, B.C., has increased during the past winter. Coal cutting machines are being used successfully.

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At the Testing Station of the U. S. Geological Survey, Technological Branch, at Pittsburg, all "permissible" explosives are put through three series of tests. In one, a mixture of gas and air containing 8 per cent. of methane and ethane is used; in another, a mixture of gas, air, and dust, containing 4 per cent. of methane and ethane, is used; and in another, dust and air without gas are used.

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Crude oil has been adopted as a preservative by two large American railways. Railway ties treated three years ago, when taken out and examined were entirely free from decay.

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Fifty-seven per cent. of the total producer gas horsepower in the United States is developed from bituminous coal and lignite. Two producer gas plants that will utilize peat are in course of construction.

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Josephinite, a natural nickel-iron alloy found in placer gravels, contains, according to one analysis, 60.45 per cent. nickel, 23.22 per cent. iron, 0.55 per cent. cobalt, and 12.26 per cent. anhydrous silicates.

## EXCHANGES.

*The Engineering and Mining Journal*, April 16th, 1910.—In the Coeur d'Alene district, according to Edward S. Wiard in the latest of his excellent articles on "Ore Dressing in the Coeur d'Alene District," the vanner is the final concentrating machine. Its chief advantage is that a high-grade concentrate can be made and this is attained largely by the shake of the machine. The shaking causes high tailings. To secure low tailings and clean concentrates, Mr. Wiard argues that the vanner should be used in the first treatment of material too fine for successful separation on tables of the Rittinger type. The tailings can then be led to convex revolving buddles, the low-grade made on the buddles being enriched on a vanner and the tailings from the latter returned to the buddle. For retreatment work of this kind, Mr. Wiard regards the buddle more favourably than the vanner. Vanners, he states, might be run better than in most mills.

*The Mining World*, April 16th, 1910.—The Mining World, referring editorially to the care of machinery, alludes to the necessity of having on hand at the mine duplicate parts of machines that are especially liable to become broken or worn out. Regular inspection should never be omitted. Machinery can thus be kept in proper adjustment and properly lubricated, and weaknesses detected before a breakdown may occur.

*The Daily Mining Record*, Denver, April 16th, 1910.—The Record has this to say concerning drill-hole ore reserves:—

"A critical attitude toward the drilling operations at the so-called porphyry copper mines of the West has recently developed among followers of the mining share markets. The disposition to scrutinize ore reserves very closely is usually the result of a series of market disasters, and this appears to explain the discussion concerning the permanency and value of the deposits that are calculated from drill hole data. A mistaken conclusion regarding this type of mines has in some quarters been drawn from the recent unfavourable reports concerning the Granby of British Columbia, which does not belong to the same class as Utah Copper, Nevada Consolidated and others like them, and is being operated upon a different system of ore treatment. Nevertheless, the Granby incident has evidently served to bring under review the whole question of ore reserves in the low-grade copper mines and to reflect unnecessary doubts upon the permanency of the so-called porphyries.

"It is certainly true that drill holes 200 feet apart cannot supply data concerning the mineralized character of the ground between them, and that the actual proof of the ore must follow from the usual developments, which precede production, but the inferences from experience are such as to satisfy some of the best mining men in the business. Blocked out ore is not predicated upon the data of drill cores by anyone, and it is just as well that the investor in stocks should fully understand this. The results of drilling can mean that large mineralized areas are present, but they mean also that regular development is necessary before any production can be made. In some quarters it is contended that the ores usually prove to be higher in copper tenor than the drill cores show, but it may require more experience to fully establish this as a rule.

"The ores indicated by drills may be called conditional reserves, but the condition has not yet been shown to be material. Some engineers think such results are ample, and are willing to accept them as close approximations, while others are not willing to accept the figures thus secured and expect verification by the usual standards of development before offering any calculations at all.

"In our judgment it is merely the argument of a stock market 'bear' that seeks to undermine the element of assurance as to the life of 'porphyry' deposits indicated by the drill holes, when these have been put down in great numbers over large areas. It is normally sufficient to urge that exact tonnages and exact values cannot be determined save by development. It may serve the 'bear' to remember that even the best sampling of a mine can give only an approximation. Safe approximations are all that the mine explorer is after, on the hither side of smelter returns."

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## CANADIAN PATENTS.

The following is a list of Canadian patents granted on April 12th, 1910, relating to mining and metallurgy and furnished by Fetherstonhaugh & Company, 5 Elgin street, Ottawa, Canada, Russel S. Smart, resident, from whom all information regarding same may be obtained:

124928.—A. S. Ramage, Newark, N. J., Methods of recovering iron from ores and preparing iron alloys. The Electrical Steel Company of Canada.

124968.—Wm. H. Fletcher, Jackson's Drift, Transvaal. Mills or apparatus for crushing or pulverizing ores, minerals and the like.

124980.—A. H. Kidney, New York, N. Y. Means of exhausting and condensing furnace fumes.

124993.—Chas. M. Mullen, Portland, Ill. Car roofs.

124989.—F. D. Melhuish, Atlanta, Ga. Ore concentrators.

124990.—C. Miele, Gutersloh, Westfalia, Germany. Processes of producing a uniform metallic coating.

124991.—Jas. E. Moody, Toronto, Ont. Centering molds.

125008.—A. Poulson, Farnworth, near Wednes, County of Lancaster, Eng. Manufacture of gelatinous silica.

125011.—A. S. Ramage, Buffalo, N. Y. Processes of producing electrolytic copper.

125012.—A. S. Ramage, Buffalo, N. Y. Processes for the separation of mineral combinations.

125013.—A. S. Ramage, Buffalo, N. Y. Processes of recovering metals from ores.

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New Brunswick gypsum compares very favourably in point of purity with gypsum from other countries. Hillsboro', N. B., gypsum contains 79.55 per cent. calcium sulphate, 20.94 per cent. water of combination, and not more than 0.10 per cent. of any one impurity.

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Meteoric iron, according to analyses by chemists of the United States Geological Survey, ranges from 4.81 per cent. to 14.95 per cent. nickel.

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The Commonwealth Oil Corporation, an English concern formed to exploit the oil-shales of New South Wales, will depend largely upon government protection in marketing its products.

## CORRESPONDENCE.

To the Editor Elk Lake, April 21st, 1910.

THE CANADIAN MINING JOURNAL, Toronto.

Sir, — I should like through the medium of your paper, to draw the attention of those interested in mining matters throughout Ontario to the law pertaining to the survey of claims as laid down in The Mining Act of Ontario, sections 113-116.

In section 113, clauses 2, 3, 4 and 5, the method of surveying claims is laid down for the benefit of the surveyor, but this method doesn't do the prospector or owner of a claim much good.

If the surveyor ties up his posts, and runs a tie line to the nearest known point, his duties are apparently ended.

But it often happens that claims overlap, and two or even three parties may imagine that they own the same ground.

The survey then is of no use, except to outline the ground in dispute, and the result is generally an expensive lawsuit, a luxury which very few prospectors can afford.

I quote the following case, (similar to many others), which was brought to my notice yesterday by a disgusted prospector.

He, or his partners, staked a fraction near Leroy Lake, Gow Ganda district, which fraction is surrounded by claims since proved to be very valuable.

To make sure of doing his work within his boundaries, he had his fraction surveyed, did his thirty days' work, and got a certificate of record.

This was last year. Twice the property was nearly sold. The "Abstract" showed it to be in "good standing."

Lately, however, he returned to Leroy Lake to do his second year's work and was astonished to find that someone else had done some considerable trenching on his ground.

Not understanding the reason for this, he took a trip to the Recording Office at Gow Ganda, and found that another party held a certificate of record covering the same ground, and that a third party also had done work on, and claimed the property.

How can a law which permits such a mix-up to be possible, benefit the prospector.

My friend is out the price of the survey and thirty days' work, and was told candidly enough by the recorder at Gow Ganda, that the best thing he could do was to let the claim go, as he hadn't a leg to stand on if he tried to fight the case!

And supposing he had done his second year's work last autumn, instead of leaving it till the spring, he'd have been out that much too, and apparently he has no redress.

I should like to see the survey of claims carried out throughout Ontario on similar lines to the survey in British Columbia.

Before starting out to survey a claim or group, let the surveyor, having access to the recorder's office and working in conjunction with him, examine the books showing applications of record for surrounding claims.

Then let him CUT OUT those portions of claims overlapping the claim he is surveying and which have prior rights to that claim.

The claim then as surveyed, or what is left of it, will beyond doubt be the ground to which the locator is entitled.

This doesn't mean much more work for the surveyor, but it means a great deal more satisfaction for the prospector.

And after all who is entitled to the protection of his interests more than the prospector, who for the most part spends what he gets in developing the country.

One more point I should like to bring forward.

The survey of a mining claim in British Columbia is equivalent to an assessment, and is recorded as such—the assessment being valued at $100.

The advantage to prospectors and would-be prospectors, of having claims surveyed is obvious—the boundaries are absolutely defined, and its location.

Why not, then, let it take the place of thirty days' assessment work out of the 240 days which has to be done before a patent or lease can be granted.

After all, does thirty days' work more than counterbalance the benefit gained by definitely outlining a locator's claim?

As things stand at present too much money is spent by prospectors and claim owners in lawsuits, which are prejudicial to a mining community.

The government would lose nothing by the change and the prospector would benefit much.

Yours truly, R. O. HAWTREY.

# SPECIAL CORRESPONDENCE

### NOVA SCOTIA.

**Glace Bay, April 14th, 1910.**—The weather conditions in the Gulf of the St. Lawrence have been most favourable to an early opening of navigation, and the collieries have taken advantage of the absence of drift-ice and the open state of the river to make early shipments of coal to Montreal. The first steamer to arrive from sea at Montreal was the Kron Prinz Olaf, which reached Montreal on the 12th of April. The earliest recorded arrival from sea at Montreal previously was the 22nd of April, so that this year's performance will doubtless establish a new record that will stand for a long time. Both Sydney and Louisburg have been completely free from drift-ice this spring.

The annual meeting of the shareholders of the Dominion Coal Company was a notable one in many respects. In commenting on the decreased earnings of the Coal Company many of the newspapers stated that the United Mine Workers' strike had caused an expenditure of $1,250,000, which is an entirely incorrect view of the matter. In comparing 1909 with the years immediately preceding it, it must be remembered that the Coal Company's earnings included the excess price paid by the Steel Company for its coal during the contract litigation. It must also be noted that the first part of 1909 was a period of depression in the coal trade. In view of these two facts and the strike it is distinctly encouraging to coal shareholders to know that their property was able to earn $1,100,000 on an output of 2,734,000 tons, which is just about one million tons less than the output capacity of the mines. That such a result should have been obtained says a good deal for the manner in which the officers of the company fulfilled their duties in the face of great difficulties. One of the company's mines was idle practically the whole year, and another mine had not fully recovered from the effects of a disastrous fire.

The company has been compelled to police practically a whole county, and it seems not a little anomalous that a Canadian corporation in which a large amount of Canadian capital is invested, should have been allowed to be harassed by the

alien delegates of a foreign organization. The situation partakes of absurdity when it is also considered that a bill was actually presented to the Commons of Nova Scotia proposing that recognition of this union should be made compulsory on the coal companies. In view of what has passed, a legislature that should dare to enact such a law should be impeached for treason. The courts of Nova Scotia were also used by this alien union to further harass the coal companies with the aid of funds from the United States. This American union has no respect for our courts of justice. The restraining injunction of Judge Lawrence has so far been treated with absolute contempt, and not only have the foreign officers of the U. M. W. refused to obey the injunction of the Nova Scotia Supreme Court, but they have openly advised their followers to pay no attention to it. The argument of the international unions is that Labour should not be refused the right to international affiliation and combination, while Capital is under no such restrictions. This argument cannot wholly be gainsaid, but the fallacy lies in the fact that combinations of capital are made under the law of the land for a lawful and usually beneficial end, whereas the actions which have been pursued by the United Mine Workers in the strike at Glace Bay, have been unlawful, and the persons who have been sent here from the United States to direct the operations of the U. M. W. are not amenable to the laws of this country—laugh at them in fact. There has been a virtual state of war in Cape Breton for the past nine months, but the enemy that has attacked our home industry has been under the protection of Canadian laws, and no contraband has been declared against his munitions of warfare. As the Canadian law stands to-day, no industry in this country is safe should the head of a United States labour organization decide to concentrate the resources of that organization against one particular company. Surely our industries are entitled to some protection against the foreigner. It is true that no part of the Empire has as a neighbour so populous and wealthy a nation as the United States, but considering even this fact it is almost unthinkable that such a state of affairs as exists at Glace Bay to-day could be permitted in any other part of the British realm. It has been said,—and who can contradict it?—that the unrest which the U. M. W. have caused in Nova Scotia is viewed with favour by coal operators in the United States, because it serves their ends and their designs upon the Canadian coal market. If this were so the laws of Canada afford no remedy, and the Canadian shareholder must bear the brunt. Persons travelling by the Sydney & Louisburg Railway may any evening see workmen living along the line side escorted to their homes by policemen, and will notice that the houses of the men who dare to work, despite the mandate of a gentleman in Indianapolis, U.S.A., are all shuttered with heavy boards to prevent stones and other missiles from being thrown through the windows at the occupants. This is one example among hundreds of the state of affairs which has been allowed to continue at Glace Bay and around the collieries. Until the arrival of this American organization, with its medieval methods, the colliery districts had been remarkably orderly, considering the mixture of nationalities and the quality of the whiskey which is dispensed in the saloons of Glace Bay. The town of Glace Bay had a very limited number of policemen, and one solitary constable constituted the protection which the Coal Company considered necessary for the property and the persons of its workmen. The collieries were all unfenced and completely open to the public. To-day every colliery is enclosed by a fence, which is illuminated at night. The company has to maintain a large force of uniformed constables, and hitherto innocent citizens go about "heeled" like a Western desperado. The change is a remarkable one, but it is also one which has marked the advent of the United Mine Workers in other places. This unfortunate state of affairs could not have come about had not the leaders of the U. M. W. worked their astute and ancient game of setting the political parties of this province by the ears—not that this is a difficult matter—but surely it is by this time apparent to both Liberal and Conservative that the unfortunate miners who have followed the lead of the U. M. W. are being heartlessly exploited by this organization, and that eventually, unless this pernicious nest of disturbers is driven from our province, these deluded men will lose all they have and be driven either to leave the country or become paupers on a county already saddled with extraordinary expenses also due to the presence of the U. M. W. in Cape Breton. Many of the strikers are men enthused with the martyr spirit, confident that they are fighting the battle of right, and they are content to be herded together, as one of themselves worded it "like rats in a hole," while their leaders eat dollar dinners on the Intercolonial Railway, and attend conventions in the Land of the Stars and Stripes. The officer who shares the hardships of his men gains their respect and confidence, but the "walking delegate" from Indianapolis, Kansas and Alabama, as we know him in Glace Bay, is a parasite, and sooner or later must meet with the fate that befalls all such creatures when their victims realise their presence.

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## ONTARIO.

**Cobalt.**—The agreement between the Chambers-Ferland Mining Company, and the Ontario Government regarding the royalty reduction has at last been signed. The Chambers-Ferland has done practically no shipping for a year, waiting, it is said, in the hopes of getting the royalty reduced, and now that it is a settled fact they will join the list of regular shippers. It is understood that there is a considerable quantity of both high and low grade ore on hand. When this is shipped it will, of course, come under the reduced royalty. Formerly this company paid 25 per cent. of the gross proceeds of the ore, but now they only pay 25 per cent. of the net proceeds. At present there are three high grade veins being worked and the second class ore which runs in the neighbourhood of 250 ounces, is an important consideration. Several promising veins have been discovered on the Nipissing property near the Chambers-Ferland and this section will be thoroughly prospected this summer.

Another ore shoot has been opened up on Peterson Lake lease of the Little Nipissing. From the bottom of the winze, which is down 240 feet, a cross-cut was run and when in about 20 feet the vein was cut. It shows from two to three inches of smaltite carrying native silver. This property is now getting air from the Mines Power and it is the intention of the management to operate four drills. The property was formerly greatly hampered on account of the lack of power.

The shipments for the month of March were quite heavy and show an advance of about 420 tons over the previous month, and are about 100 tons greater than the shipments for the corresponding month of last year. Altogether eighteen mines sent out 84 cars aggregating 2,601 tons Three new shippers have been added to the list, the Waldman, the Hagraves and the Chambers-Ferland. With the exception of the Provincial Mine, the Waldman is the first property to ship ore from the Gillies Limit. The McKinley-Darragh shipped more high grade ore during the month than any other property, and with its increased mill capacity it is expected that it will be able to maintain a large output.

The Hargraves has cut the No. 1 vein at the 125-foot level in a cross-cut from the shaft. Where cut the vein was about four inches wide and carries high values in silver. This vein was found near the Drummond boundary on the surface and at the 75 foot level good ore was found in the conglomerate. The shaft was then continued and the vein picked up on the lower level. At the lowest level of the No. 3 shaft a winze is being sunk on the vein and will be continued for about 60 feet.

Since the Bailey obtained power to run its hoist and com-

pressor, underground work is proceeding much more rapidly and good results have already been obtained. A winze has been put down twenty-five feet below the tunnel level, and has disclosed a considerable body of medium grade ore. There is about four feet that will assay nearly five hundred ounces. The main values, of course, are carried by several stringers of high grade ore, but the rock lying between these is also well mineralized. The main shaft is to be sunk an additional fifty feet, and from the bottom a cross-cut will be run to open up the Bailey vein, which is the principal ore body so far discovered on the property. The plant consists of the first half of an electrically driven twelve drill compressor and an electric hoist. The compressor will in all probability be shortly discarded for the Power air. Arrangements have been made with the Cobalt Central to treat 500 tons of the Bailey ore in the former company's mill.

Judgment has been rendered in the action brought by the Peterson Lake Mining Company against the Nova Scotia, with regard to the latter company's lease on Peterson Lake. The Peterson Lake had an injunction issued restraining the Nova Scotia from mining the lands covered by the lease. This has been dissolved. The Peterson Lake also claimed the lease to be forfeited on account of non-compliance with its conditions. The judge stated that he was unable to find any evidence pointing to fraud and that although there might have been failure in some cases to comply with the literal terms of the lease, such failure was acquiesced in by the representatives of the plaintiffs. The royalty has been fixed at 25 per cent. of the gross value of the products and not 25 per cent. of the net proceeds, as claimed by the Nova Scotia.

At least three promising properties in South Lorrain have changed hands during the past two weeks, and negotiations are under way for several others. The Mitchell-Brocklebank claim in the vicinity of Ox Bow Lake has been sold for $25,000. Practically no work has been done on this property, but several promising veins, some carrying smaltite, have been uncovered on the surface. The Martin claim, in the same locality, has also been sold to New York and Philadelphia people for a good figure. This property has not been developed, but a company is being formed to take it over and work it this summer. New York people also purchased the claim known as H. R. 227 for the sum of $15,000. The district of South Lorrain is growing in importance every day and should become one of the most important camps outside of Cobalt. The installation of the substation by the Mines Power Company for the distribution of electric power, will have a very beneficial effect. This power is to be sold at $50 a horse-power year and will mean a tremendous decrease in power costs. The Maidens property has another good ore shoot in their vein. In sinking the vein practically pinched out for a short distance, but on going down a little further the ore came in again, carrying as high values as formerly. The Haileybury Frontier has been getting good ore in the drift, and assays of over 3,000 ounces have been obtained. The shaft will be sunk as rapidly as possible and arrangements have been made with the Keeley to supply air for one drill for this purpose.

A new concern, to be known as the Dominion Reduction Company, is being formed for the purpose of building a customs concentrator to mill the low grade Cobalt ores. It is expected that it will be erected in the vicinity of Giroux Lake, in close proximity to the T. & N. O. Railway's branch line to Kerr Lake. The promoters expect to build a mill of from 50 to 60 tons capacity, and state they will have it running within four months of the date work is started on it. At the present time there are two customs concentrators in camp, the Northern Customs and the Nipissing Reduction. These mills have all that they can handle for some time to come, so that there should be a good opening for another one.

The Temiskaming mill is now running steadily and is putting through about eighty tons a day, and the shipments from this property, which have been small for the last several months, will show a material increase. The main mill is several hundred feet distant from the crushing plant and the two are connected by an aerial tramway. Considerable high grade ore is now coming from the 350-foot level, and in the process of winning it large quantities of low grade ore are also being produced. The main tonnage for the mill is, however, coming from the dump.

Another high grade vein has been found on the Wyandoh property in the Gillies Limit. It is, however, very narrow, being only about half an inch wide, but carries a good deal of native silver. Work is to be started shortly on several of the Limit lots, but so far this section of the camp has been very disappointing. It is probable that the Government will have other sales this summer, but the project will not meet with any great favour from investors in this section of the country.

The Hudson Bay has struck a high grade ore shoot in the No. 5 vein on the first level. The ore is about two inches in width and runs over four thousand ounces in silver. A small shipment from the dump was made to the Cobalt Central mill to get an idea of its average value. The results obtained were satisfactory.

Since power has been turned on at the Peterson Lake leases there has been a great increase in activity in that part of the camp. The Kerry Mining Company has opened up an ore shoot on the 200-foot level. A cross-cut will also be run from the Kerry shaft to the Scott lease. The Peterson Lake is opening up the vein from which it got its last car of high grade, and will probably have another car before long.

The long-drawn-out suit between the Coniagas Mine and the town of Cobalt has at last been settled. The case was finished some time ago, but judgment was only given within the last few days. The suit arose out of the fact that the Coniagas contended that it had the right to mine on any of the lots or streets under which it had the mineral rights. As part of its mining lands take in one of the principal sections of the town, this was a very serious matter and suit was accordingly brought. The trouble was started by the arrest of some of the company's officers for having a prospecting trench dug upon one of the streets. The mine's contention was upheld by the courts, and it is at liberty to use the surface for any mining operations it sees fit. As regards the streets, the company will have to submit a plan of proposed operations that will have the approval of the town engineer before the work can be started.

## PORCUPINE AND OUTLYING DISTRICTS.

Eleven more of the claims staked by Wilson and Edwards in Porcupine, have, it is stated, been sold to the Dome Mining Company and McCormick Bros., of New York. The price is believed to be in the neighbourhood of $1,200,000. The Dome Company purchased six of the Wilson claims some time ago, among them the famous claim which was responsible for the rush into that district. McCormick Bros. were negotiating for this property but they failed to come to any agreement. On the eleven other claims just purchased the initial payment of $35,000 has been made, and the balance is payable in installments. The car shipped from the Timmins property to the States is still held up at the border, awaiting the customs clearance papers. It will be sent on to its destination in the course of a day or two. The Scottish Ontario Gold Company is at present installing its machinery, and as soon as this is in working order its force of men will be considerably augmented. The values in the bottom of the shaft are stated to be very good. The Canadian Northern Silver Mines are negotiating for the four Dixon claims. The price asked is in the neighbourhood of $50,000. A new company, known as the Porcupine Gold Mines Company, has been formed with a capitalization of $2,000,000, to work several properties known as the Vipond claims. Camps have been erected and a force of men will be employed this summer in thoroughly prospecting the company's holdings.

A short time ago Northern Ontario was startled with the report of a new gold discovery south of Matheson, and for a time the greatest excitement prevailed. Two prospectors arrived in Haileybury with samples of telluride ores which they claimed to have taken from claims they had staked near Caribou Lake, about twelve miles west of Bourke's siding on the T. & N. O. Railway. These samples were shown to several prominent men in the town and the prospectors are stated to have raised a considerable sum of money upon swearing to an affidavit that the samples came from their claims and promising to lead these men into the place. Engineers were engaged to go in and look over the ground, but before they were ready to start the news leaked out and prospectors began swarming in from all directions. In order to be first on the ground the engineers hired a special train to take them to Bourke's siding. The country proved to be practically impassable, consisting mainly of swamp and muskeg. When they arrived at their destination they found that they had been tricked and that the only sign of mineral was a quartz vein worked by one of the old settlers, on which a twenty-foot shaft had been sunk. The best assay ever obtained from it was ten dollars in gold and there were no signs of tellurides. Other prospectors going in fared badly, and one party is known to have spent three days in getting twelve miles. Blackburn and his partner are supposed to have brought their samples from the West. As soon as the engineers arrived at the railroad they telegraphed orders to have Blackburn arrested, but neither he nor Jones have been seen since It is believed that there were fully 250 men starting in to the scene of the reported discovery within two days of the time the news leaked out, and they are all swearing vengeance against the men who misled them.

The change in the mining laws of Quebec has resulted in an influx of prospectors, with the result that several promising discoveries of silver and copper have already been reported. One or two small plants are now working in the vicinity of Fabre township, and if good results are obtained a great deal of activity may be expected in this section.

Navigation has opened on the Montreal River and boats are now running between Latchford and Elk Lake. For the present there will only be one boat a day leaving each end, but a little later the Navigation Company will run two trips daily.

## BRITISH COLUMBIA.

**Rossland.**—It is noted that the Dominion Government is taking under consideration the question of coining a one-dollar piece to take the place of the filthy one-dollar bills now in circulation. This is a laudable move. It is hoped, however, that the large silver dollars, as used by many foreign countries, will not be decided upon, as when all is said and done they are rather heavy. A coin of some more valuable metal than the ordinary silver coin could be made of a size midway between the twenty-five and fifty-cent piece that would fill the bill admirably. Something of this character would be a great advance over the heavy silver dollar and the germ-laden one-dollar bill now in daily use in the Dominion. It is estimated that from 4,000,000 to 90,000,000 germs of smallpox, typhoid, tuberculosis, diphtheria, etc., may be found on the dirty dollar bills in circulation. Surely this would warrant a clean coin being put out and the retirement of most of the one-dollar bills.

It is a pleasure to note that committees are being appointed by the Government to make a general modification of the mining laws of Canada. This will do away with the present confusing state of affairs in that direction. It is to be hoped that the committee in charge of this work will extend its labours to the question of boiler inspection, and will straighten out the existing anomalies in the various and sundry Acts on this question, which appear to be working a hardship on both mining and mill men and the manufacturers, as to some extent personalities enter into the subject, often to the detriment of those most concerned. No doubt this phase of the situation is to be considered by the committees.

The outlook at the Le Roi Mine here remains the same as for some weeks past. Mr. A. J. McMillan, in a recent interview sized the thing up in the following words: "We are diamond drilling from the 1650-foot level and have already put a number of holes down to a depth of 2,200 feet. Our plans call for a systematic exploration of our ground in this manner and we are hopeful of being just as successful in locating pay shoots as our neighbours, the War Eagle, have been."

**Nelson.**—The zinc miners of East Kootenay seem to think that a portion of the money appropriated for experimental work should be expended in their district. This would be all right if the work could be done economically and something would be gained. It is considered here that the experiments can be carried out locally in a very economical manner and if the results are favourable, of course, it will redound to the good of all of the zinc property in this country. There is already an experimental zinc smelter in Nelson; power from Bonnington Falls for electrical smelting can be obtained at reasonable rates and many of the important zinc mines are contiguous to this city, all of which would aid toward an economical expenditure of the money appropriated.

The Blue Bell, zinc mine, has closed down, and will no doubt remain inactive pending results of some of the experimental work on the zinc question. The Blue Bell concentrator has been treating about 900 tons of low-grade ore per week and has shipped approximately 1,100 tons of concentrate since the first of the year. Most of this ore came from the adit level, however, and while there are large deposits of this ore below these workings the mine is not properly equipped to handle it economically, so that an addition to the plant is contemplated.

The season's outlook for the surrounding districts augurs well and good strikes of ore are reported from the Rambler-Cariboo, Slocan Star mine, Mother Lode, Yankee Girl and others. A body of galena averaging 50 per cent lead and 200 ounces silver was located on the Hidden Treasure claim of the Slocan Star group. A streak of grey copper was also found on the same property. The Lucky Jim zinc mine is once more shipping to American smelters and is trying to arrange for a steady production of 100 tons per day. The company is contemplating the building of a 100-ton concentrator at Kaslo, which would enable it to put out a quantity of its second-class ore. It is pleasing to note that a force of men has been put back into the upper workings at the St. Eugene, Moyie. This property is now shipping about 800 tons of concentrate per month to Trail smelter.

The McGillivray Creek Coal & Coke Company is gradually increasing its output. The new tipple is now working. Electric fans have been installed and work on the new adit begun.

**Phoenix.**—Considerable comment is being made upon Granby affairs lately, owing to the recent slump in the company's stock, which was caused by adverse reports emanating from the company's officers. Much has been said on both sides of the question and at this date nothing definite has resulted. An engineer who recently made a hurried examination of the property claims they only have about 6,000,000 tons of ore "in sight." The report of this company for the half year ending December 31st, 1909, shows that the smelter treated 572,371 tons of its own ore. At this rate there is five years' ore in sight. But if we understand the situation rightly there are still the factors of probable ore and possible ore to be taken into consideration, and the "personal equation" of the engineer reporting enters into the calculations at this point. Some local mining men state that the company is over-capitalized and cannot earn 8 per cent. Unless the writer's memory fails him, Mr. Lyman A. Sisley, of the "Mining World," who follows these matters closely, has figured that the dividend-paying copper properties of the United States average in the aggregate about 5 per cent. net, so that

it is only fair to compare Granby capitalization on the same basis as the other big copper producers and not on an 8 per cent. basis. We could name several dividend-paying mines in this country that have not more than eighteen months' ore in sight. With these Granby compares very favourably. There is one thing certain, while the officials of the company may not be to blame, and that is that the stock was manipulated on the New York and Boston exchanges. If the insiders had been possessed of doubts they would have sold out quietly, and the thing came on too quickly to be a general rout of the average shareholders. While there are probably only three or four men who know the exact situation, we are inclined to be optimistic here and will have to be shown that all this gossip is true before believing. This company owns a block of ground in a widely mineralized district four miles long and two miles wide and a patch of this, 3,000 feet long and 1,500 feet wide, is all that has been worked so far. The report referred to above shows that it cost the Granby Company for that period $2.86 per ton to mine and treat its ore. It will be agreed that this is fairly low. The cost of copper produced, per pound, was 10.4 cents and the average price received was 13.139 cents. The balance sheet of the company, December 31st, 1909, read as follows: (Assets) Cost land, machinery, etc., $15,505,417; stocks and bonds, $994,822; supplies, $257,544; cash and copper, $801,-284; total, $17,559,077. (Liabilities) Capital outstanding, $13,-500,000; dividends held, $120,956; cash loan, $875,000; accounts payable, $97,152; advance on copper, $250,000; surplus, $2,715,-969; total $17,559,077.

There is much activity in store for Nickle Plate camp, Hedley, this season. The new Rand 2,300-foot compressor is now running smoothly and furnishing a full supply of air for all present purposes. The 40-stamp mill is treating about 150 tons of ore per day, the mineral content being saved at present by means of amalgam plates, Frue vanners and the cyanide plant. An Allis-Chalmers tube mill and a set of Deister tables, with filter presses, etc., have been ordered, with a view to making a better extraction. In order that the mining and milling plant of the Daly Reduction Company may be run all the year round a steam auxiliary plant has been ordered. This will consist of three 150 horsepower return tubular boilers, a 275 kilowatt generator and a 375 horsepower high speed engine. The generator may also be operated by water power, of which the company has a plentiful supply at certain seasons of the year. Motors will be put in the mine and mill and the current from the power plant transmitted to points where it is needed. Much of the machinery in the mill is now operated by independent water wheels, which has resulted in a shut-down in the past when water was scarce. This will be overcome by means of the new plant, which will enable the company to work on a larger and more steady scale.

# GENERAL MINING NEWS.

## NEW BRUNSWICK.

**St. John, N.B., April 16.**—At a stormy meeting of directors of Disraeli Asbestos Company yesterday J. M. Healy, treasurer, resigned and two other St. John directors were asked to retire.

Mr. R. D. Isaacs has been away from the city three weeks, but his wife says she expects him back in two weeks.

On Thursday Roch. Gagne, L. A. Codere and F. X. Lebranche, accompanied by their legal adviser, W. Banks, B. F. Campbell and A. W. Warrell, who have considerable interest in the concern, arrived from Sherbrooke, and after holding several meetings and examining the books came to the conclusion that the interests of the shareholders demanded the resignation of Mr. Isaacs, as managing director, and other members of the board residing in St. John.

Their investigation revealed, it is said, the fact that the company, which is incorporated under the laws of the State of Arizona, had not taken out a license to do business either in New Brunswick or Quebec.

The directors declare that the shareholders had no particular occasion for alarm. The irregularities in regard to incorporation of the company could easily be straightened out, and its properties were undoubtedly valuable, and with energetic management could be easily made to yield large returns.

Headquarters will probably be removed to Sherbrooke.

## ONTARIO.

**Cobalt, April 15.**—On the four hundred foot aerial tramway between the Temiskaming rock house and the mill the half-ton skips are now travelling regularly to the hundred ton concentrator on the rise above the Temiskaming and Beaver mines. All last week the mill was running, sometimes ten, sometimes twenty, stamps, but with the additional h.p. permitted, the whole battery of thirty stamps was running.

So far the results obtained have averaged up to tests. Much of the high grade ore that is now being brought to the surface is from the 350 foot level, and in the process of mining it, much low grade is taken out and is passed on to the mill.

Upon another tramway cars are running to the dump and returning to the rock house, where it is fed into the big crusher and passed through the screen, the undersize going directly to the skips and the mill, while the oversize passed to rolls. Nothing above three-quarters inch goes to the mill.

On the top floor of the mill the metallics are taken out in four trommels, three jigs and tables, and before it leaves 65 per cent. of the estimated extraction has been made.

The jig concentrates are running about 3,000 ounces, and the table concentrates between three and four thousand. The motors, both in the mill and the rock house, are now running smoothly, and since the addition of power the stamps have been falling regularly. From now the Temiskaming mill will treat in the neighbourhood of a hundred tons a day.

**Sudbury.**—The Mond Nickel Company has taken an option on the Mount Nickel locations, belonging to the Great Lakes Mining Company. Two diamond drills are now at work and it is hoped that the continuation of good ore will be found in depth.

The Canadian Copper Company is drilling in the same neighbourhood, between the Stobie and Frood mines.

**Wabigoon.**—Following are the officers of the Merger Mines, Limited, which is about to commence the development of the famous Laurentian mine in the Manitou:

President—E. E. Hedges.

Vice-President and Treasurer—J. P. Kaiser.

Secretary—John B. Corliss.

Directors—E. E. Hedges, J. P. Kaiser, John B. Corliss, E. R. Warner, and Carl Hoffman, all of Detroit with the exception of Hedges, who is a Boston man.

The capital is 3,000,000, in one dollar shares.

Mr. F. Hille, M.E., has been appointed consulting engineer and will have charge of organizing the forces at the mine.

The new company comes into control of 1,200 acres, which includes, besides the Laurentian, several other properties in great or less stages of development.

A force of men is now engaged in cutting wood and putting things to rights around the mine, though for the matter of that ever since the Imperial Bank closed down on the property it has been carefully looked after. Water was not allowed to accumulate in the shaft and work can be started just as soon as the organization of the working forces has been completed.

### BRITISH COLUMBIA.

**Nicola.**—It is given out that the Nicola Valley Coal & Coke Company's mines at Middlesboro will shortly be producing 1,500 tons of coal daily. A progressive policy of development has been inaugurated and if the C. P. R. provides the cars the maximum output will shortly be reached. At present 300 men are employed, but this staff will steadily be increased.

Two new tunnels are now being bored which will give a greater coal area. These will be completed in a few weeks' time. The company has completed arrangements with Scottish and English capital for the installation of 1,000 coke ovens. The work will not be undertaken until the construction of the Kettle Valley Railway is well under way and there is assurance of early completion. The coke will be shipped to the boundary, where it is thought there will be a splendid market.

The new tunnel in No. 3, which is being built, will connect with No. 2. A new mine is being opened up in No. 1 mine.

In No. 5 mine a 5-foot seam was struck. It is claimed by those who know that it is the finest and cleanest coal yet struck in the camp, there being no indication of any rock whatever.

An electric plant is to be installed this summer which will run the whole works. This is particularly required to move cars from No. 2 tipple to No. 1 tipple. This plant will be sufficiently large enough to furnish Merritt with electricity if the citizens here desire such a much-needed improvement.

**Nelson.**—At the Mother Lode Mine, Sheep Creek, a promising vein was recently struck on the 300-foot level. The Mother Lode is controlled by Mr. John McMartin, formerly of the La Rose Syndicate.

### YUKON.

**White Horse.**—The holdings of the Yukon-Pueblo Mining Company at White Horse have been purchased by the Atlas Mining Company. The latter company is organized under the laws of West Virginia. The stock is largely held in Spokane. The mine will in future be known as the Atlas.

# MINING NEWS OF THE WORLD.

### RUSSIA.

From the middle of January last until the present time there has been an almost complete absence of any illuminating oil at Batoum for export abroad and to the inner ports. Tank steamers are waiting in the port for weeks without any chance of their being loaded, as oil comes from Baku in exceedingly limited quantities. Instead of the usual 1,500 to 1,750 tons arriving daily through the pipe-line, scarcely 200 to 250 tons are pumped now. The main reason for this state of things is that the refiners are abstaining from sending their oil until the new reduced tariff comes into force.

### NEW ZEALAND.

**Wellington, 4th April.**—The New Zealand gold output for March amounted to 36,449 ounces, valued at £142,841, as compared with 40,044 ounces, valued at £156,522, during the corresponding month of last year. The silver output for the month was 110,204 ounces, valued at £11,029, as compared with 204,008 ounces, valued at £20,343, during March, 1909.

### SOUTH AFRICA.

A co-operative smelting works, of which the various mining companies on the Rand have become members, has been formed, which is likely to prove of considerable convenience to the industry. The blast furnace of the Robinson Gold Mining Company has been taken over, and alterations and additions are being made to enable the new company to begin smelting operations at once.

The Transvaal Coal Owners' Association has effected an arrangement whereby rate cutting has been abolished. The association laboured under the disadvantage that several important properties were not included therein, such as Messrs. Lewis and Marks' Vereeniging undertaking and the Witbank Colliery, the expanding outputs from which were a menace to those who were included in the combination. This amalgamation of interests has long been the desire of the leading financial houses, and we are informed that pending its completion Messrs. Eckstein held back a very substantial contract which has now been placed.

### UNITED STATES.

**New York, April 15.**—Following an announcement yesterday of an increase in pay for employees of the United States Steel Corporation and its subsidiaries, Elbert R. Gary, chairman of the executive committee, made public this afternoon details of a plan for the relief of employees injured at work and the families of men killed. The plan will be put in operation May 1, for a year's test. The cost will be several millions a year and employees do not contribute.

For temporary disablement, single men will receive 35 per cent. of their wages and married men fifty per cent., with an additional five per cent. for each child under 16, and two per cent. for each year of service above five years. For permanent injuries lump payments are provided, based upon the extent to which the injury interferes with employment and the annual earning capacity of the victim.

Where employees are killed, their families will receive a sum equal to his wages for a year and a half, with an additional ten per cent. for each child under 16, and three per cent. for each year of service above five years. In case of injury a period of ten days must elapse before relief begins.

**Goldfield, Nev., April 16.**—General Manager J. R. Finley of the Goldfield Consolidated Mines Company has given out the following statement concerning the conditions at the big mill, which was damaged by fire last week:

"We hope to have the 80 uninjured stamps of the mill running in about 30 days, which is the very shortest possible time in which arrangements can be made to get ore into the mill. Practically all equipment has been ordered, and as fast as it comes in all the men that can be worked on reconstruction will be busy. A big force of men is now engaged in clearing away the wreckage where it is not too hot to handle. Of course there will necessarily be some curtailment of mining operations, but this is only on the ore extraction end. We have no place to put the ore now. But the force working on development will be largely increased. We will endeavour to find a place for every man employed by the company, and will use many of the men who are out of their regular work by the stoppage of the mill in helping clear away the debris and in reconstruction work."

**Ely, Nev., April 13.**—It is officially announced that the plant of the International Smelting & Refining Company at Tooele, Utah, will be ready to receive ores by about the middle of May. By that time, or not long thereafter, the Giroux Company should be able to ship high grade ore from the lower levels of the Alpha shaft if the management desires to do so.

**Globe, Ariz., April 13.**—The Detroit Copper Company has filed an answer to the complaint of the Mine & Smelting Supply Company, which charges the mining company with purchasing ore concentrates which infringe on the Wilfley patents. The answer is a general denial of all material allegations in the complaint of the defendants, stating that it has no knowledge that Arthur R. Wilfley was the first and sole inventor of the ore concentrator or that these improvements have gone into great and extended use and have displaced or superseded to a great extent all other apparatus and means for ore dressing by concentration. The company also denies that it purchased any concentrators containing and embodying the invention set forth in the complaint.

A showing also is made in the answer that the making and using of concentrating tables is an old and well known art patented and used in many forms before Wilfley's time and cites letters patent from that of Baran No. 35,197, granted in 1862, to that of Pike No. 586,534, in 1896, while the Wilfley patent was issued as No. 490,675 and was for "narrow and specific improvement in an old art."

The answer is signed by Robert S. Taylor, counsel for the defendant, E. E. Ellinwood, and W. K. Flora. Mr. Taylor is chairman of the committee on patent law of the American Bar Association, and has been retained by the Deister Concentrator Company to defend the suits brought against companies purchasing the Deister concentrators.

# COMPANY NOTES.

### CALUMET AND HECLA.

The report of the Calumet & Arizona Mining Company for 1909 shows total receipts of $5,054,664, as compared with $4,204,608 for the year 1908. Dividends paid amounted to $800,000, which was the same as in the previous year. Cash on hand at the end of 1909 was $813,360, as against $73,259 at the end of 1908. The company produced 27,630,050 pounds of refined copper in 1909, as against 28,048,329 in 1908. The average price received was a trifle over 13 cents a pound, as compared with a little less than 13 cents in 1908. The gold and silver produced during the year amounted to $211,760, as compared with $234,358 in 1908.

### DIVIDEND ON KERR LAKE.

Kerr Lake directors on April 13th declared regular quarterly dividend of 25 cents per share, and 25 cents extra, payable June 15, to stockholders of record June 1.

### PROFITS OF B. C. COPPER COMPANY.

The returns of the British Columbia Copper Company for January and February of this year, operating in the Boundary district, indicate net profits of $73,500 for the two months. The copper output was 1,339,707 pounds, with 15,151 ounces of silver and 5,073 ounces of gold. After crediting these gold and silver values the company was able to lay copper down in New York refined at a cost of less than eight cents per pound. The production follows:

| | Jan. | Feb. |
|---|---|---|
| Copper, lbs. | 656,573 | 683,234 |
| Silver, ounces | 7,530 | 7,627 |
| Gold, ounces | 2,513 | 2,560 |

The returns from the smelter for the first three months of the year indicate approximately the same amount of ore reduced as in the corresponding months in 1909, but the gold and silver values have been running higher this year. It is expected that when ores from the Jackpot mine will be treated, a still greater increase in gold and silver values will be shown.

It is probable the work of enlarging the reduction works will commence immediately, increasing its capacity to about 3,000 tons per day. By the time the enlargement shall have been completed the company will likely have controlling representation on the directorate of the New Dominion Copper Company, whose mines are being got in readiness.

The McKinley-Darragh Cobalt Mine's report for the year ended December 31 last shows a total surplus of $120,687, an increase of $74,000.

### ANNUAL MEETING DOMINION COAL COMPANY.

The Dominion Coal Company's annual meeting was held in Montreal on April 12th. President Plummer's statements were well received and no animus was shown.

In answer to questions Mr. Plummer gave it as his opinion that the merger would assuredly benefit shareholders in both companies.

After the report had been read and adopted, the President expressed his gratification at the fact that the new board had been able to accept the figures prepared by the old management without change. He also called the shareholders' attention to the fact that the falling off in the year's earnings was due entirely to the strike. He advised that the shareholders should not be discouraged by the report. They had a property in excellent condition, he said, and with established earning power. Only patience was needed, with present difficulties, before the company emerged from its troubles and entered once more upon a season of prosperity.

The company's real earning power, according to Mr. Plummer, should be based upon the earnings of the last previous unbroken year rather than upon that for the past year, when the company had been hampered and its output curtailed by serious difficulties. The policy of this new board would be to treat the shareholders with absolute frankness and to let them at all times know the exact facts.

The dispute with the Steel Company was referred to feelingly by the president who declared that he sincerely hoped that this would be the last time it was ever mentioned in an annual meeting of the Coal Co. There was a sum of $3,550,000 to be paid to the Steel Company under the decision. This was not dead loss but merely meant the repayment of a sum which had been held outstanding, and refunded when the decision was announced.

The strike was largely responsible for the heavy loss which had led to the bond issue.

Since the report had been issued two or three matters had taken up the Board's time. One was the question of the price which the Steel Company was to pay for the coal supplied. This had finally been fixed at $1.55 per ton. Mr. Plummer said that this price left a margin of profit above the cost of production.

One good result of the dispute was that the ground had been cleared and the companies were now on a definite working basis.

The normal output of the company at this time of year was 10,000 tons per day. This was the present output also. Later in the year the output increased considerably.

The total yearly output might easily be increased to 4,000,000 tons, and it was the aim of the board to accomplish this.

Whatever agreement might finally be made, the proposals would have to be submitted to both boards. The supposition had gained ground that the Steel Company could force the Coal

Company into a merger against the wishes of the Coal shareholders. Mr. Plummer pointed out that some forty or fifty thousand shares would have to accept the terms. He thought that this clause fully protected the Coal shareholders.

Many conditions there were that made it very difficult to come to an agreement. There was no way out unless both sides were prepared to give and take. Immense benefits would accrue to both companies if such an agreement became an accepted fact.

The earnings of both companies were substantial. The earnings of the Steel Company would no doubt be less in some years to come and also in other years would be more. The same thing was true of the Coal Company. The alliance of the two companies and the uniting of the earnings would have a balancing effect, the value of which could not be overestimated.

Mr. Plummer here made an interesting comparison of the two companies' assets. Excluding ore deposits, the values of which were very difficult to determine, the assets of the Steel Company are $20,000,000; of the Coal Company $12,000,000.

The new plants of the Steel Company would increase the company's earning capacity thirty per cent. On the other hand, there was to be considered the removal of the steel bounty and other depreciation, which would imply a loss for the Steel Company of from $225,000 to $230,000 yearly.

A resolution supporting the board in its determination to hold out against the demands of the U. M. W. A. in the strike was unanimously adopted. Mr. M. J. Butler, the general manager, presented some figures on the present conditions in regard to the strike. He was at the present time some 1,350 men short, but he was replacing these every day with new arrivals.

There were elected to the Board of Directors Col. James Mason, of Toronto, representing Toronto shareholders, and Sir William Van Horne, to represent the Steel interests.

# STATISTICS AND RETURNS

### INTERNATIONAL COAL COMPANY.

| | |
|---|---|
| Shipments, March, 1910 | 22,115 tons. |
| Shipments, March, 1909 | 22,848 tons. |
| Decrease, March, 1910 | 733 tons. |
| Shipments, 3 months, 1910 | 59,283 tons. |
| Shipments, 3 months, 1909 | 60,911 tons. |
| Decrease, 3 months, 1910 | 1,638 tons. |

### ACADIA COAL COMPANY.

| | |
|---|---|
| Shipments, March, 1910 | 19,630 tons. |
| Shipments, March, 1909 | 14,828 tons. |
| Increase, March, 1910 | 4,802 tons. |
| Shipments, 3 months, 1910 | 64,717 tons. |
| Shipments, 3 months, 1909 | 57,867 tons. |
| Increase, 3 months, 1910 | 6,850 tons. |

### INVERNESS RY. & COAL COMPANY.

| | |
|---|---|
| Shipments, March, 1910 | 20,641 tons. |
| Shipments, March, 1909 | 7,021 tons. |
| Increase, March, 1910 | 13,620 tons. |
| Shipments, 3 months, 1910 | 59,468 tons. |
| Shipments, 3 months, 1909 | 26,412 tons. |
| Increase, 3 months 1910 | 33,056 tons. |

### NOVA SCOTIA STEEL & COAL COMPANY, LIMITED.

| | |
|---|---|
| Shipments, March, 1910 | 29,218 tons. |
| Shipments, March, 1909 | 21,474 tons. |
| Increase, March, 1910 | 7,744 tons. |
| Shipments, 3 months, 1910 | 103,565 tons. |
| Shipments, 3 months, 1909 | 81,247 tons. |
| Increase, 3 months 1910 | 22,318 tons. |

### MARITIME COAL, RY. & POWER COMPANY.

| | |
|---|---|
| Shipments, March, 1910 | 14,851 tons. |
| Shipments, March, 1909 | 8,540 tons. |
| Increase, March, 1910 | 6,311 tons. |

### B. C. ORE SHIPMENTS.

The ore shipments and smelter receipts for the week ending April 9th are well up to the average for the year. Appended are the details:

**Boundary.**

| | Week. | Year. |
|---|---|---|
| Granby | 24,432 | 355,885 |
| Mother Lode | 9,500 | 125,805 |
| Oro Denoro | 350 | 4,130 |
| Snowshoe | 3,114 | 52,790 |
| Total | 50,002 | 713,710 |

**Smelter Receipts**

| | | |
|---|---|---|
| Granby | 24,432 | 356,005 |
| Cons. Co. | 9,566 | 141,315 |
| B. C. Copper Co. | 9,850 | 129,935 |
| Total | 43,848 | 627,255 |

### COBALT ORE SHIPMENTS.

Following are the shipments from the Cobalt camp for the week ending April 15, and those from January 1, 1910, to date:

| | April 15. Ore in lbs. | Since Jan. 1. Ore in lbs. |
|---|---|---|
| Buffalo | 62,650 | 585,178 |
| City of Cobalt | ..... | 300,445 |
| Chambers-Ferland | 64,300 | 122,300 |
| Cobalt Central | ..... | 205,186 |
| Cobalt Lake | 64,000 | 196,000 |
| Cobalt Townsite | 68,000 | 68,000 |
| Colonial | ..... | 107,260 |
| Coniagas | ..... | 434,096 |
| Crown Reserve | 83,800 | 1,591,370 |
| Drummond | ..... | 664,200 |
| Hargraves | ..... | 41,800 |
| Hudson Bay | ..... | 123,695 |
| Kerr Lake | 238,444 | 2,157,523 |
| King Edward | ..... | 134,506 |
| La Rose | 331,820 | 3,814,070 |

| | | |
|---|---|---|
| McKinley-Darragh | 148,550 | 873,991 |
| Nipissing | 208,631 | 3,161,635 |
| O'Brien | | 453,006 |
| Peterson Lake | | 170,450 |
| Right of Way | | 509,717 |
| Silver Cliff | | 66,010 |
| Temiskaming | | 238,300 |
| Trethewey | | 254,650 |
| Waldman | | 63,992 |

Ore shipments for week ending April 15 were 1,270,196 pounds or 635 tons.

Total shipments from January 1 to April 15 were 16,337,380 pounds, or 8,168 tons.

## SHARE MARKET.

Courtesy of Warren, Gzowski & Co.

### Miscellaneous.

| | Bid. | Ask. |
|---|---|---|
| Amalgamated Asbestos | 26½ | |
| Dom. Coal, com | .. | 68½ |
| Dom. Steel com | 68¼ | 68½ |
| N. S. Steel | .. | 82 |
| Granby | 48 | 49 |
| Consol. Smelting | 82 | 87 |
| Crows' Nest Pass | .. | 86 |

### Cobalt Stocks.

| | | |
|---|---|---|
| Amalgamated | .04 | .05 |
| Beaver Consolidated | .34 | .34½ |
| Buffalo | 2.17 | 2.60 |
| Chambers-Ferland | .31¾ | .33½ |
| City of Cobalt | .28 | .29 |
| Cobalt Central | .11 | .12 |
| Cobalt Lake | .27⅜ | .27¾ |
| Coniagas | 5.50 | 5.60 |
| Crown Reserve | 3.23 | 3.26 |
| Gifford | .08½ | .09 |
| Foster | .14 | .19 |
| Green-Meehan | .03½ | .05 |
| Great Northern | .08¾ | .09½ |
| Hudson Bay | 104.00 | 109.00 |
| Hargraves | .33¾ | .34 |
| Kerr Lake | 8.65 | 8.80 |
| La Rose | 3.65 | 3.72 |
| Little Nipissing | .23¾ | .24 |
| McKinley-Darragh-Savage | .92 | .95 |
| Nancy Helen | .07 | .08 |
| Nipissing | 9.80 | 10.00 |
| Nova Scotia | .36 | .38 |
| Otisse | .05½ | .05¾ |
| Peterson Lake | .22½ | .23 |
| Right of Way | ... | ... |
| Rochester | .17 | .17½ |
| Silver Leaf | .07¾ | .08 |
| Silver Bar | .06½ | .07¾ |
| Silver Queen | .10 | .14 |
| Temiskaming | .67⅜ | .67½ |
| Trethewey | 1.35½ | 1.36 |
| Watts | .09 | .12 |
| Ophir | .68 offered | |
| Wettlaufer | .95 | 1.02 |

### New York Curb.

| | | |
|---|---|---|
| Boston Copper | 18 | 20 |
| Brit. Col. Copper | 6¼ | 6½ |
| Butte Coalition | 21⅞ | 22½ |
| Chino Copper | 12¾ | 13 |
| Davis-Daly Cop | 2 | 2¼ |
| Ely Consolidated | ⅝ | 11/16 |
| Gila Copper | 6 | 6½ |
| Giroux Mining | 8 | 8¼ |
| Goldfield Consol | 8 | 8⅛ |
| Green-Can | 9 | 9¼ |
| Harcuvar Copper | 35 | 41 |
| Inspiration Copper | 7⅝ | 7 11/16 |
| Miami Copper | 23½ | 23⅞ |
| New Baltic Copper | 6¾bid | |
| Nevada Con. Copper | 20⅝ | 20⅞ |
| Ohio Copper | 3½ | 3 9/16 |
| Rawhide Coalition | 37 | 38 |
| Ray Central | 3 | 3 1/16 |
| Ray Consolidated | 18¾ | 19 |
| Union Mines | 1⅞ | 1 15-16 |
| Yukon Gold | 4⅜ | 4½ |

## TORONTO MARKETS.

### Metals.

April 20.—(Quotations from Canada Metal Co., Toronto.)

Spelter, 5¾ cents per lb.
Lead, 3.70 cents per lb.
Antimony, 8 to 8½ cents per lb.
Tin, 34.25 cents per lb.
Copper, casting, 14.10 cents per lb.
Electrolytic, 14.10 cents per lb.
Ingot brass, 9 to 12½ cents per lb.

April 20.—(Quotations from Drummond McCall Co.)

Summerlee No. 1, $23.50 to $24 (f. o. b. Toronto).
Summerlee No. 2, $23 (f. o. b. Toronto).
Midland No. 1, off the market.
Coal, Anthracite, $5.50 to $6.75.
Bituminous, $3.50 to $4.50 for 1¼ inch lump.

### Coke.

April 15.—Connellsville coke (f. o. b. ovens).

Furnace coke, prompt, $1.70 to $1.80 per ton.
Foundry coke, prompt, $2.25 to $2.35 per ton.

April 15.—Tin (Straits), 33.10 cents.

Copper, prime lake, 13.12½ to 13.37½ cents.
Electrolytic copper, 12.85 to 12.95 cents.
Copper wire, 14.25 cents.
Lead, 4.45 cents.
Spelter, 5.60 to 5.70 cents.
Sheet zinc (f. o. b. smelter), 7.75 cents.
Antimony, Cookson's, 8.37½ cents.
Aluminium, 23.50 to 24.00 cents.
Nickel, 40.00 to 49.00 cents.
Platinum, ordinary, $29.50 per ounce.
Platinum, hard, $35.00 per ounce.
Bismuth, $1.75 per lb.
Quicksilver, $48 per 75 lb. flask.

## SILVER PRICES.

| | New York. cents. | London. pence. |
|---|---|---|
| April 7 | 52⅛ | 24 |
| " 8 | 52¼ | 24 1/16 |
| " 9 | 52½ | 24 3/16 |
| " 11 | 53 | 24⅜ |
| " 12 | 53⅛ | 24 7/16 |
| " 13 | 53⅜ | 24 9/16 |
| " 14 | 53¼ | 24½ |
| " 15 | 53½ | 24⅝ |
| " 16 | 53½ | 24⅝ |
| " 18 | 53⅜ | 24 9/16 |
| " 19 | 53⅜ | 24 9/16 |
| " 20 | 53¼ | 24½ |