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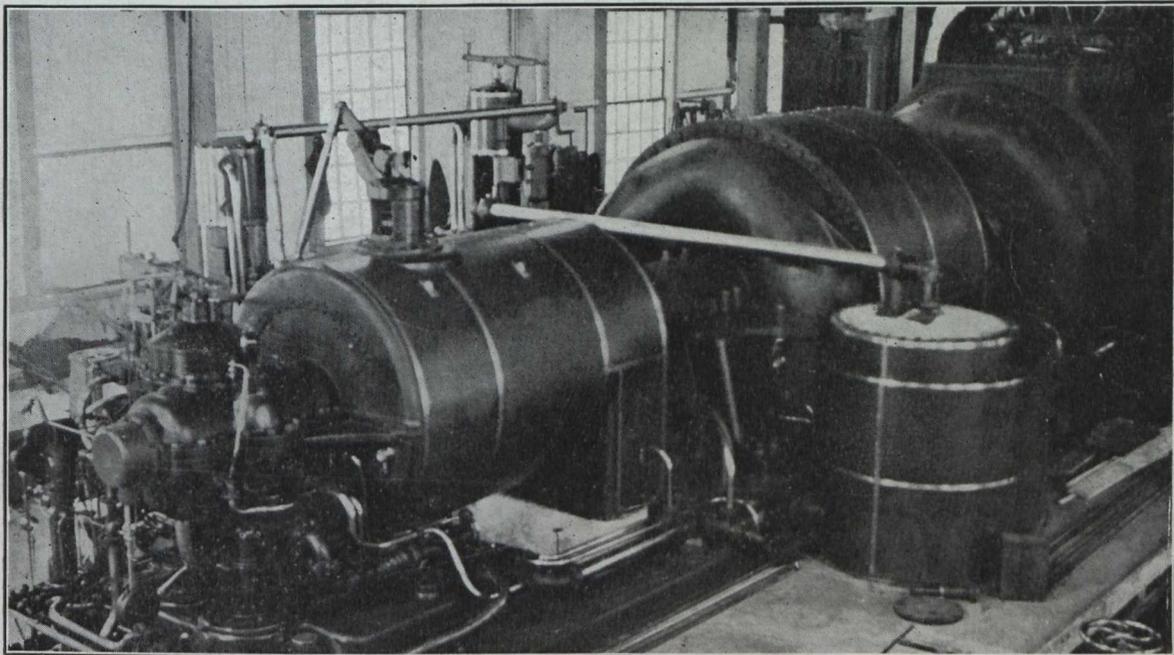
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VOL. XXXVI

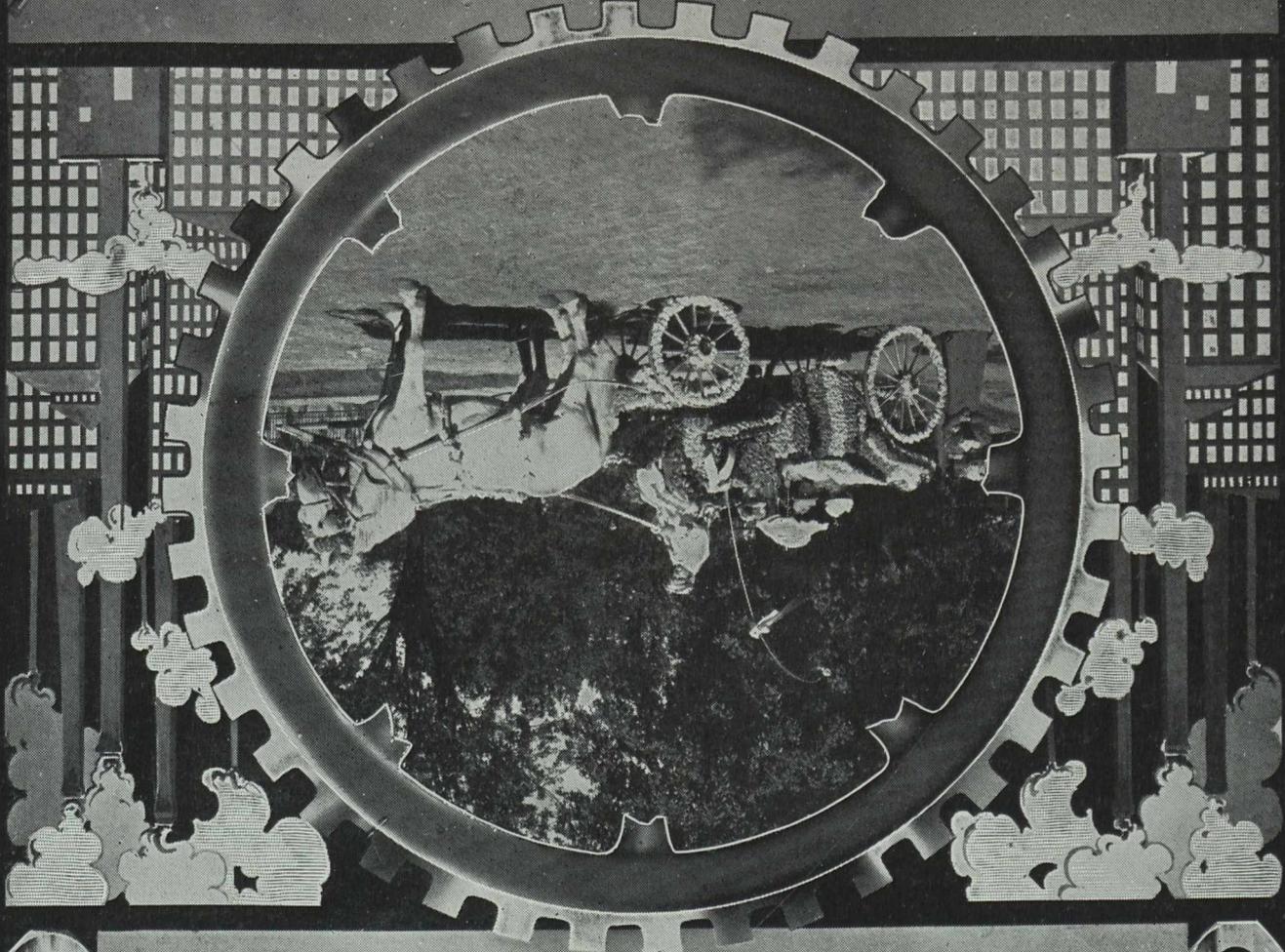
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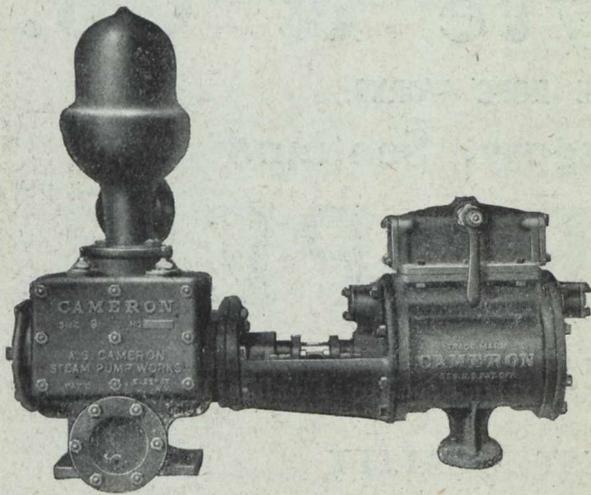


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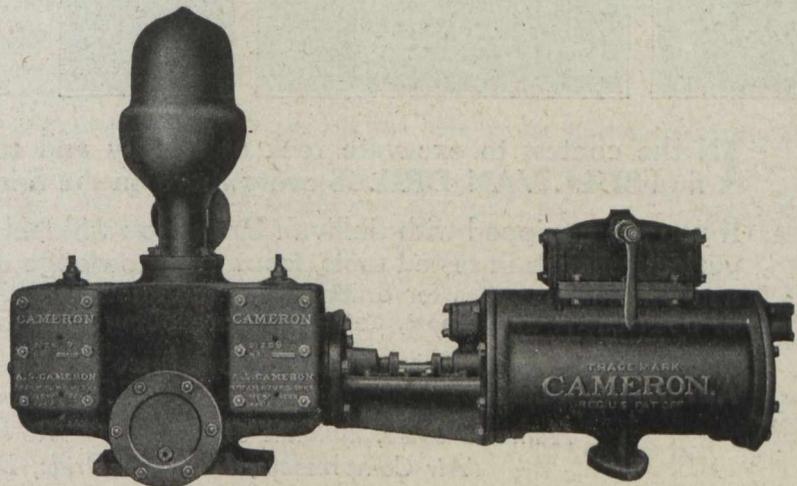
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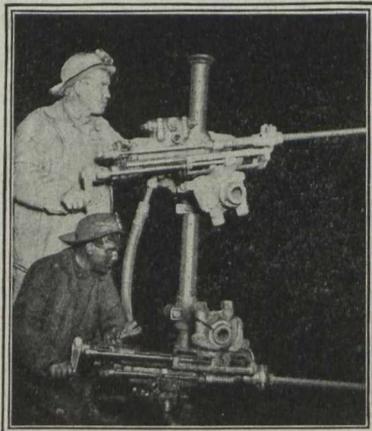
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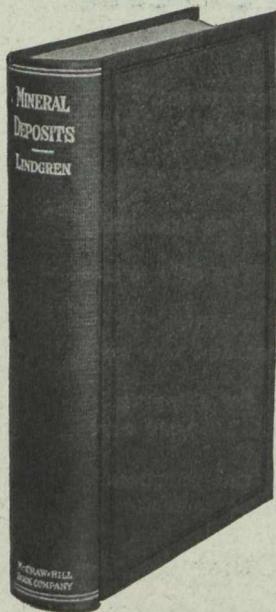
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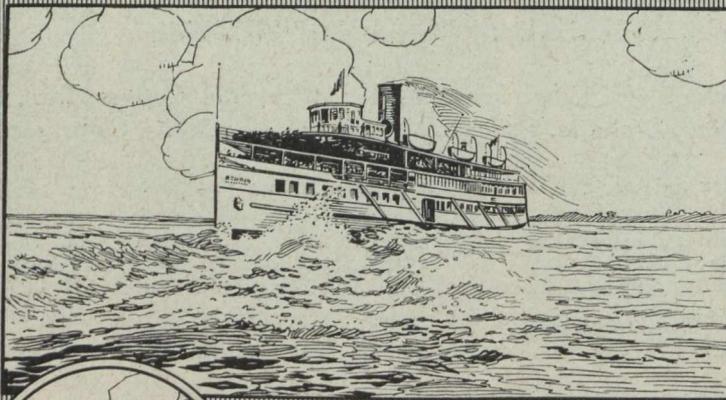
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—CONTENTS—

Introduction.
Deposition of Minerals.
The Flow of Underground Waters.
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The Chemical Work of Underground Waters.
The Origin of Underground Water and its Dissolved Substances.
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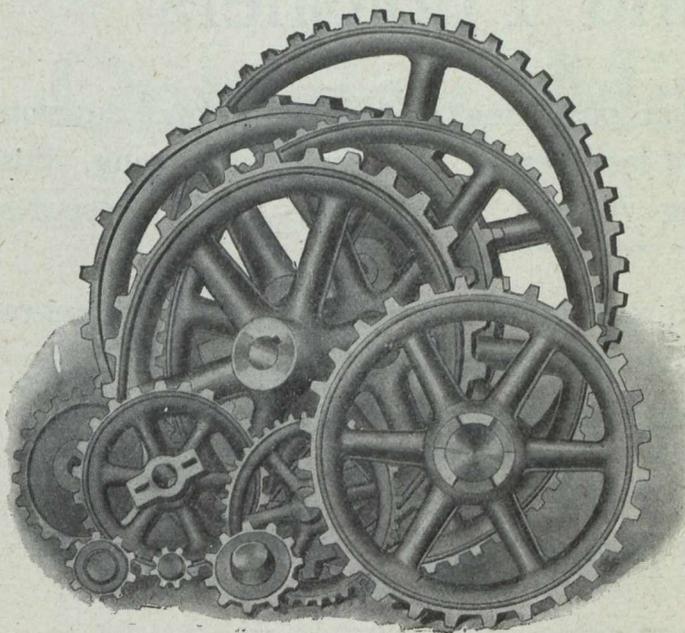
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COAL mining rights of the Dominion, in Manitoba, Saskatchewan and Alberta, the Yukon Territory, the North-West Territories and in a portion of the Province of British Columbia, may be leased for a term of twenty-one years at an annual rental of \$1 an acre. Not more than 2,560 acres will be leased to one applicant.

Application for a lease must be made by the applicant in person to the Agent or Sub-Agent of the district in which the rights applied for are situated.

In surveyed territory the land must be described by sections, or legal sub-divisions of sections, and in unsurveyed territory the tract applied for shall be staked out by the applicant himself.

Each application must be accompanied by a fee of \$5 which will be refunded if the rights applied for are not available, but not otherwise. A royalty shall be paid on the merchantable output of the mine at the rate of five cents per ton.

The person operating the mine shall furnish the Agent with sworn returns accounting for the full quantity of merchantable coal mined and pay the royalty thereon. If the coal mining rights are not being operated, such returns should be furnished at least once a year.

The lease will include the coal mining rights only, but the lessee may be permitted to purchase whatever available surface rights may be considered necessary for the working of the mine at the rate of \$10.00 an acre.

For full information application should be made to the Secretary of the Department of the Interior, Ottawa, or to any Agent or Sub-Agent of Dominion Lands.

W. W. CORY, Deputy Minister of the Interior.

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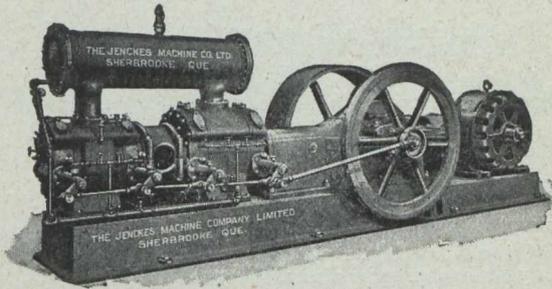
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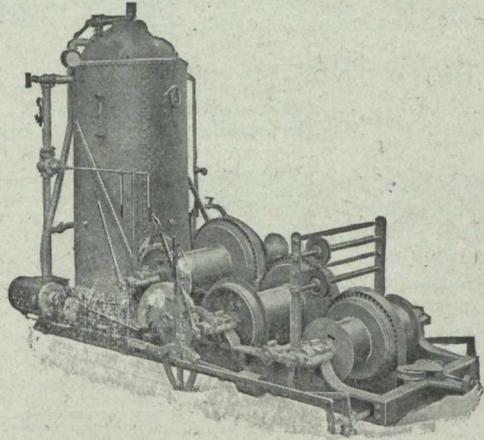
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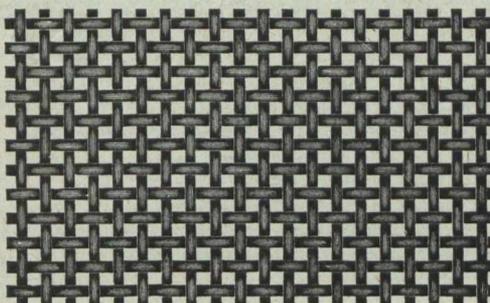
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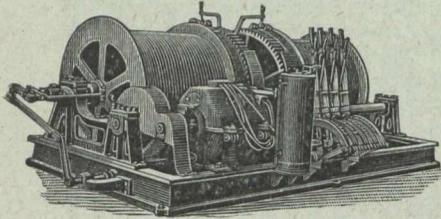
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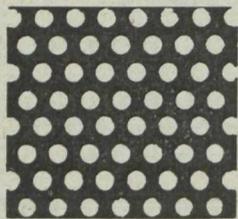
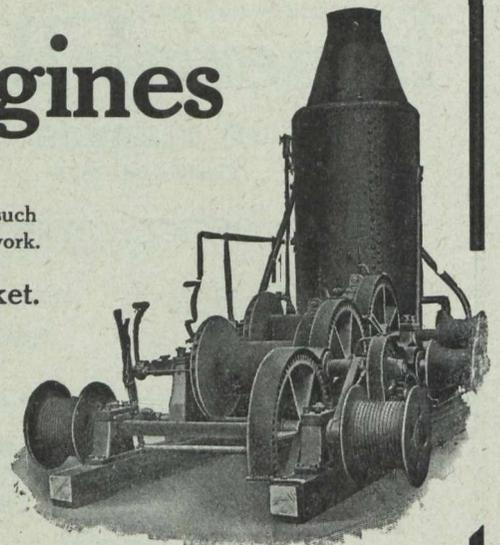
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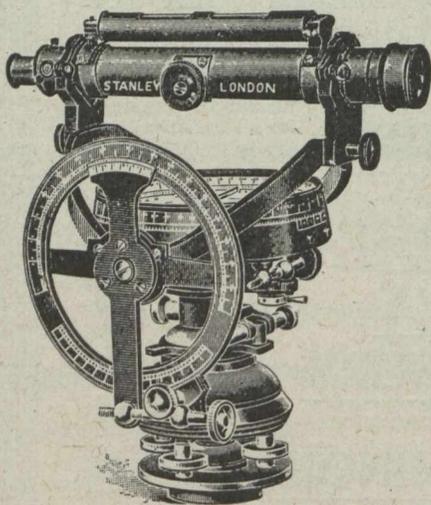
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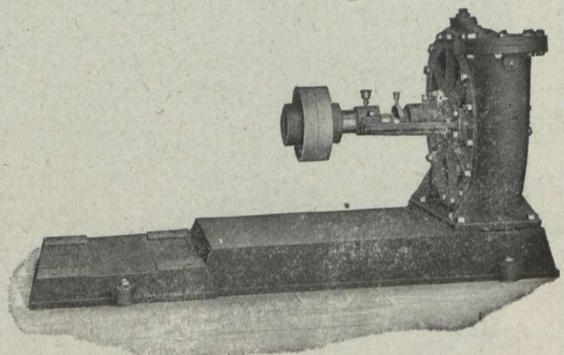
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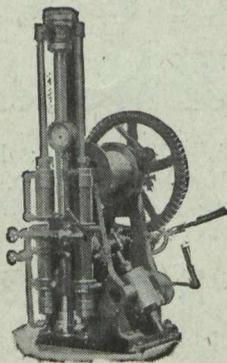
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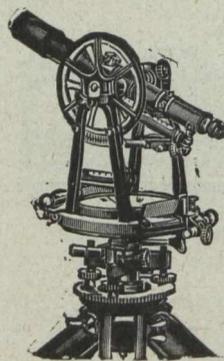
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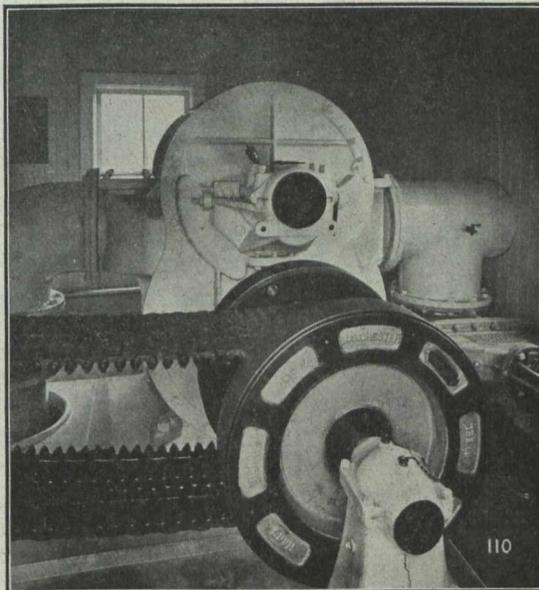
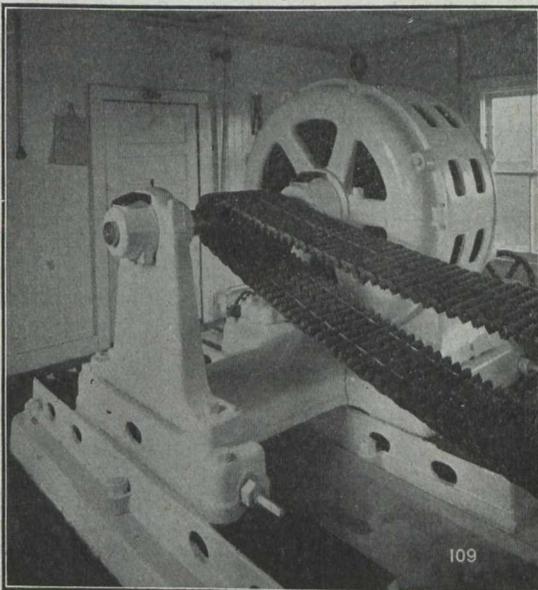
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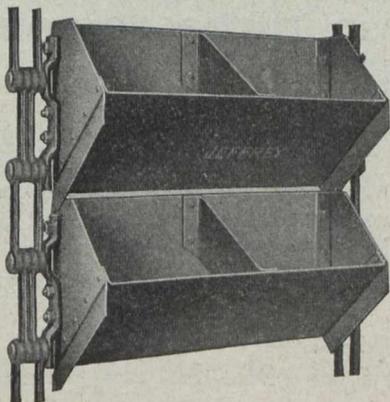
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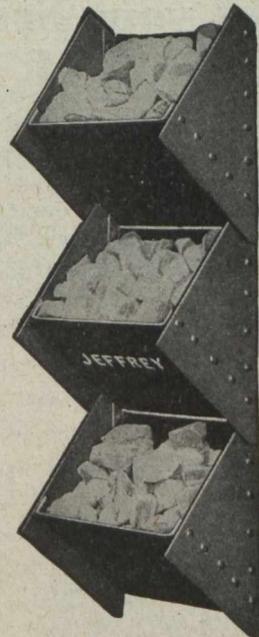
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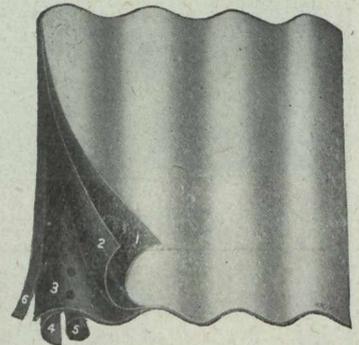
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THE CANADIAN MINING JOURNAL

VOL. XXXVI.

TORONTO, Aug. 15, 1915.

No. 16

The Canadian Mining Journal

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REGINALD E. HORE

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CIRCULATION

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THE DISCOVERY OF CORUNDUM IN ONTARIO

Mr. H. M. Ami, in a letter to the Secretary of the Canadian Mining Institute, has some startling information concerning the discovery of corundum in Ontario. According to the late Dr. A. E. Barlow, the presence of corundum in the northern part of the county of Hastings, Ont., was really made known as the result of a visit made in October, 1896, by Mr. W. F. Ferrier, then lithologist to the Geological Survey of Canada. In the Summary Report for the year 1896 Mr. Ferrier relates the history of the discovery and the circumstances which occasioned his visit to that region. He writes: "One of the most interesting occurrences upon which I have to report is the recent discovery of corundum in Hastings county, Ontario. This came about in a somewhat unusual way. In 1893 I came into possession, by purchase, of a number of specimens collected by Mr. John Stewart, formerly of Ottawa, amongst them being a package labeled 'Pyroxene crystals south part of Carlow.' On examining these specimens some time ago I recognized them as corundum, and immediately took steps to ascertain, if possible, the precise locality from which they came. As you are aware, I communicated the facts to you and was authorized in October to visit the township of Carlow, endeavor to locate this mineral, and determine the extent of the deposit. I was accompanied by Mr. A. A. Cole, and after considerable difficulty found the mineral on lot 14, con. 14, of the township of Carlow, Hastings county, Ontario."

Previous to Mr. Ami's letter, the mining men of Canada have generally conceded the discovery of corundum in Ontario to Mr. Ferrier, and the later systematic investigation of the deposits to Dr. W. G. Miller. Now Mr. Ami, after an inexplicable silence of twenty-two years, rises to say that instead of being unknown in Ontario in 1893, corundum had been discovered, identified and even considered worth while to be mined at that time. He says that corundum from Ontario was exhibited at the World's Fair in Chicago in 1893, and that a card bearing the words, "Corundum Company of Ontario" hung over the exhibit. He says further:

"This record of the occurrence of corundum in southeastern Ontario as far back as 1893 was communicated to Mr. Ferrier and other mineralogists and geologists of the Geological Survey of Canada in the days of Dr. A. R. C. Selwyn. In consulting my notes taken at the World's Fair, Chicago, on specimens exhibited in the Mining Building with a view of ascertaining the mineral resources of the Dominion, pecul-

iar to the different geological formations constituting the earth's crust, I recently found the record of the occurrence of corundum in Canada obtained from the Ontario exhibit. This record antedates the time of the visit paid by Mr. Ferrier to the corundum locality, and his 'discovery' of the mineral in Ontario by three years."

In short Mr. Ami states that Mr. Ferrier's claim to the discovery of corundum in Ontario is as baseless as the Kaiser's claim to allegiance with God. Mr. Ferrier's former friends will be grieved to learn that they have been so long deceived in him. Possibly the Council of the Canadian Mining Institute will feel called upon to quietly get rid of the formerly honored member.

We may, however, be permitted to say a word in support of Mr. Ferrier. There was no Ontario exhibit of corundum at the Chicago Fair in 1893. The Corundum Mining Company which Mr. Ami speaks of as making the exhibit was formed in 1902. It is therefore possible that the misstatements made are in Mr. Ami's rather than in Mr. Ferrier's account.

An indication of the satisfactory demand for the nickel and copper ores of the Sudbury district is the rise this week of the stock of the International Nickel to a new high level. The Canada Copper and Mond Nickel Companies, operating in the Sudbury district, are making new records in production of nickel-copper matte.

The Overseas News Agency of Berlin claims a supply of 2,000,000 tons of copper available for war purposes in Germany. Considering that the annual production of Germany is about 25,000 tons and the annual imports about 200,000 tons, German publicists must be given credit for their magnificent imaginations.

The Timagami Forest Reserve is still the scene of mining activity. Among news items from Latchford are the resumption of operations at the White Reserve mine, Maple Mt., and the development of the Taylor property at Spring creek. Both are cobalt-silver deposits, discovered some years ago.

In the London "Globe," July 19, 1915, Mr. A. G. Charleton, Past President of the Institution of Mining and Metallurgy, makes a plea for efficiency in national service. In connection with the Registration Bill about to be put in force, he says: "I hold that the experience and mental capacity as well as the manual ability of each individual needs to be classified and card-indexed in order to secure the best results in national organization, and it is equally essential that use should be made of this information."

"It occurs to me that the provisions of the War Registration Bill will lose much of their value unless the 'forms' that are to be employed serve to distinguish and separate sheep from goats, sinews from

brains, so that the forces of the Empire can be applied properly and effectively to National Service in the best possible manner; that is to say so to apportion the work assigned to each individual in a public capacity that each one is best qualified to undertake with most advantage to the State, without detriment to national interests in other ways, by removing him from other work of perhaps greater national utility, indirectly, which he may be capable of performing in a private capacity."

The authorities have a big problem before them in classifying the men. Those who have had experience in the recently popular efficiency campaigns should be able to render special service in making the registration an intelligent one.

According to Mr. N. E. Hawco, superintendent of the construction of the terminal works at Port Nelson, the entire right of way for the Hudson Bay Railway, from Le Pas to Port Nelson, has been cut. Grading is completed for two-thirds of the way and steel laid for over 200 miles. Grading is to be completed by Christmas and steel laid next spring.

While primarily a grain route, the Hudson Bay Railway should play an important part in the development of Canada's mineral resources. Other railways in the Dominion are very largely responsible for the opening up of important mining camps. In Ontario Sudbury and Cobalt are shining examples.

Ottawa again sends out unofficial reports regarding the establishment of copper and zinc refineries in Canada. It is stated that both metals will be treated at Trail, B.C. The greater Government interest in metal refining that has been in evidence since the war began is likely to eventually result in some such move.

Welland reports the taking over a plant in that town for the treatment of zinc ores by an electrolytic process. The statement that the Weedon Mining Co. is behind the enterprise indicates that the zinc and lead deposits of Montauban township, Quebec, will be extensively worked. During the last few months of 1914, the Weedon Company was actively engaged in putting their newly acquired property into shape for production.

The price of silver is improving again, and with it the hopes of the owners of Cobalt silver stocks. The market until lately was so regularly downward that the policy of holding bullion for better prices was easily attacked by pessimistic stockholders. The directors responsible for the policy can rest a little easier now.

New York reports the arrival of \$100,000,000 by express from Halifax "in a special car heavily guarded." Considering the weight of that amount of gold, the reporter might have been pardoned for giving some details about the construction of that car.

TORONTO EXHIBITION.

There was never a time in the thirty-seven years of its history when the Canadian National Exhibition promised more real instruction and entertainment than this year. In addition to the marvelous proofs of the manner in which the patriot at home is taking care of his responsibilities in the way of increased production that the patriot at the front may have the wherewithal to keep his place in the battle line, there will be special features of patriotic and historic significance.

The big war spectacle in front of the grand stand will be quite the most elaborate pageant ever presented by the Fair, while the Model Military Camp, aeroplane flights and the mining and torpedoing of ships in the harbor, supplemented by the war trophies, will be a revelation.

The new Giant Midway, with its army of spielers, never presented a more diversified list of attractions, while the Hippodrome and Circus in front of the grand stand will be a triumph in the amusement line. The Fair this year in all departments promises to excel any previous one ever held at Toronto.

The directors are looking forward to a repetition of the "Million Year" and are planning their program on a scale to fit this immense attendance.

The engineers recommended to the Militia Department as mining instructors have been attached to the following camps: Mr. James McEvoy, with the rank of captain, Niagara and London, Ont.; Mr. Walter Herd, with the rank of captain, Valcartier camp; Mr. E. D. Black, with the rank of captain, Sewell camp, Sask., and Mr. F. A. Fortier, with the rank of lieutenant, Barriefield camp.

INTERCOLONIAL COAL.

A special general meeting of shareholders of the Intercolonial Coal Mining Co., Ltd., will be held at the head office, Room 413, Dominion Express Bldg., Montreal, on Nov. 25, for the purpose of empowering the issue of \$100,000 debentures of the company and authorizing the making of a mortgage to the Government of Nova Scotia to secure their guarantee of said debentures and of authorizing the issue of bonds to retire certain outstanding bonds and the security for the same and generally to take such other steps as may be necessary in connection with said proposals.

A press despatch sent out West from Ottawa states that the Government has decided that mining leases in the West, including British Columbia and the Yukon, held by men who are enlisting to go to the front, shall be exempt from payments while the holder is absent at the war. This is misleading so far as British Columbia is concerned, since the Dominion Government has no control over matters relating to mineral lands and leases in that Province. There is no doubt, though, that the Hon. the Minister of Mines for British Columbia will see to it that no loss will result to any man holding a mineral claim, placer lease or any other right to mining property in the Province, by reason of his having gone on active service in Europe or on any military duty in the Dominion or Bermuda.

From South Africa has come the news that the Chamber of Mines at Johannesburg has given a donation equivalent to about \$150,000 for a Union of South Africa hospital ship, a field hospital, or for any other relief purpose to which General Botha shall decide to apply it.

**THE CAPE BRETON HIGHLANDER'S
SOLILOQUY**

By F. W. Gray.

Why should I to the wars?
Why leave the lakes and pleasant hills,
Of this, my native Isle?
Where 'neath the thick spruce shade
I've found the ghost-like "Indian Pipe",
And rested me awhile.
Why should I to the wars?

Here each recurrent spring,
I've seen the stately iris bloom,
And the wild roses blow.
Have marked the lily pool,
And glimpsed along its flag-starred marge,
Wee violets hidden low.
Why should I cross the seas?

Why should I leave Strathlorne?
Loch Lomond, Uist, and Glen of Skye,
For France to journey forth?
Why should I bid farewell
To loch and ben, to beck and glen,
From Canso to Cape North?
Why should I to the wars?

Because across the seas
There lie the scattered Western Isles,
Whence my forefathers came.
They built their shielings here,
And, thinking on the Isles they loved,
Gave each a Highland name.
How could their sons forget?

Because across the seas,
Dead on the field of honor lie
Men from the Highland glen.
In the same trench they fell,
The Sassenach by kilted Gael,
Many brave Gentlemen,
Proud of their Highland name.

The same fire fills our veins
Here where the spruce and moose-grass grow,
As where the heather flames.
So go we forth to France;
We hear the pibroch fast,
And Hark! it calls our names!
The pipes are calling "Come!"

We come. The foe shall hear
Renewed the war-cry of Gael,
His coronach and fate.
Once more the Gael shall thwart
Caesar's armed legions, and thrust back
His eagles from our Gate.
The pipes are skirling fast,
And I must forth to France!

McINTYRE AND PEARL LAKE MINES.

Production of McIntyre gold mine for the month of July was as follows:

Tons milled, 9,410; value per ton, \$789; gross value, \$74,245; recovery, \$71,600 = 96%; total costs, \$44,000 = \$4.70 per ton; net profit, \$27,600.

In a statement issued August 6, President A. M. Hay says:

The operating cost is higher than last month owing to the expenditure on shaft sinking and other extensive development, all of which is charged against the tonnage milled. On the 500 ft. level at a distance of 60 feet south from No. 5 shaft, a body of ore about 20 feet wide was intersected, and drifts have been run east and west for a total distance of about 175 ft., from which ore has been mined, giving an average assay value of \$9.00 per ton over the full width of the drifts. No. 5 shaft is now down to a depth of 600 ft., and a station is being cut at that level. As soon as the workings are sufficiently advanced, sinking will be resumed to the seventh level.

Owing to the satisfactory nature of recent developments, arrangements are now being made to increase the capacity of the mill to 400 tons per day, by making additions to the cyanide plant, at a comparatively moderate cost. The crushing and milling capacity will be further increased as may be warranted by future developments.

During the month a controlling interest in the property formerly owned by the Pearl Lake Gold Mines, Limited, has been acquired by the McIntyre company on very advantageous terms, securing for it the privilege of utilizing the Pearl Lake shaft and workings in carrying on mining operations on the McIntyre property. The Pearl Lake property consists of 127 acres immediately adjoining the McIntyre locations, and is situated in a formation favorable for the occurrence of gold veins.

The operation of raising ore while sinking No. 5 shaft below the 500 ft. level is already seriously taxing its hoisting capacity. Being a two compartment shaft, only one is available for hoisting (the other being used as a manway), and 700 ft. will be the limit of depth to which it can be efficiently operated. The company had, therefore, to face in the near future an expenditure for sinking and equipping a working shaft to take care of ore from the deeper levels. The Pearl Lake shaft, which is situated only 301 ft. from the McIntyre boundary line, is already down to a depth of 665 ft. It is exceptionally well timbered and equipped with an electric hoist good for operations to a depth of 1,000 ft., and having three compartments, two will be available for hoisting, etc., so that it will serve as a main working shaft for deep mining operations on both properties.

It is proposed to resume sinking this shaft and to make connection with the McIntyre workings at the 700 ft. level, so as to provide ventilation when that depth is reached by No. 5 shaft.

The Pearl Lake property is also well equipped with buildings and plant, including an electrically driven compressor which, for some time past, has been rented by the McIntyre company for its operations at No. 5 shaft.

The terms under which the property and assets of the Pearl Lake Company have been acquired from the assignee are briefly as follows:

A new company has been formed under the name of the McIntyre Extension Mines, Limited, with a capital of 2,500,000 shares of the par value of \$1.00 each, of which 500,000 shares are placed in the Treasury.

Payment has been made by the McIntyre company

of \$47,733.30 in satisfaction of all claims of creditors of the Pearl Lake Company (with the exception of the claim of B. E. Cartwright) for which payment the McIntyre Company received 1,020,000 shares of the McIntyre Extension Company, Mr. Cartwright receiving 980,000 shares in satisfaction of his claim of \$175,000.00 for monies advanced by him to the Pearl Lake Company as admitted and passed by the assignee. A further payment of \$2,500 was made to Mr. Cartwright by purchasing from him 25,000 shares of his holdings in the Extension Company at ten cents per share in order to enable him to satisfy certain claims which, if not then disposed of, would have delayed the closing of the deal and might have involved a serious loss of time, which it was desirable to avoid in order to expedite development on the McIntyre property as above outlined.

The McIntyre Company has agreed to expend \$18,000 for development work on the Extension property which, at the option of the McIntyre Company, may be expended over a period of eighteen months at the rate of \$1,000 per month. For such expenditure the McIntyre company is to receive treasury shares of the Extension Company at the price of ten cents per share. Two offers have been received to purchase all or any portion of the treasury shares of the Extension Company at ten cents per share, so that this obligation is unimportant. It is not, however, the intention of the directors to offer any of the Extension Company's shares for sale at present. Should it be found expedient to do so later on, the treasury stock will be sold to the best advantage. Prospecting and development work on the Extension Company's property can be undertaken at a minimum of expense from the McIntyre workings some of which are within 100 ft. of the boundary line, and in the event of such development proving satisfactory, the large shareholding of the McIntyre Company in the Extension Company should become a valuable asset.

ELECTROPLATING WITH COBALT.

A paper by C. H. Buchanan and Thomas Haddow prepared for the New York Branch of the Electroplaters' Society, contains data and results of experiments covering a long period, made by the writer, C. H. Buchanan, and a report of experiments of recent date in collaboration with Thomas Haddow. Early experience showed that a chloride-cobalt solution deposited more rapidly than did a nickel solution. Subsequent work done with cobalt proved so satisfactory that if the cobalt metal could have been obtained in sufficient quantities from commercial sources, even at a cost higher than paid for nickel, it would have been adopted for general work. The results of recent tests are summarized as follows: Cobalt plating has a beautiful bluish-white color. The deposit does not tarnish as readily as nickel; it is homogeneous, with a fine, close grain; it is smooth and not brittle, and will easily withstand bending tests. The time required in order to secure a satisfactory deposit is much less with cobalt than with nickel, and the current density with cobalt may be greater. Metallic cobalt costs more than nickel, but the cost of the salts is of small importance in a comparison of the two as to economy in results. Because of the greater conductivity of cobalt as compared with nickel, a current of higher density may be used in combination with a solution of less concentration. The time required in the solution is, with cobalt, one-third that required for nickel, and there is a similar saving of time in the buffing room. The substitution of cobalt for nickel would thus greatly increase the speed of production in any established plant.

RECRUITING AMONG THE MINERS OF NOVA SCOTIA

By F. W. Gray.

By the courtesy of the several coal companies in Nova Scotia it has been possible to compile statistics on recruiting among the coal miners of Nova Scotia which may be of interest to the readers of the Journal.

The number of men who have joined the Canadian Overseas Contingents, the Militia forces for local defence or in training, and reservists and volunteers to the armies of the Allies is as follows. British reservists who reported for duty in Britain are included in the heading "British Forces":

	Forces of the Allies.	British Forces.
Cape Breton Island—		
Dominion Coal Company	540	450
Nova Scotia Steel & Coal Co.....	25	190
Inverness Coal & Railway Co. . .	17	56
Small companies .....	..	6
	582	702
Nova Scotia Mainland—		
Springhill Mines	100	165
Intercolonial Coal Co.	1	77
Acadia Coal Company	25	37
Minudie Coal Co.	15	25
Maritime Coal & Railway Co. . .	1	21
	142	325
	724	1,027

Total of approximately 1,750 men.

Allowing for certain adjustments from the figures given in the Nova Scotia Mines Report, the number of employees at the mines in Nova Scotia at the outbreak of war would be approximately 13,500 men, so that the enlistments have been at the rate of thirteen per cent., a figure that speaks for itself.

The writer has no figures relating to the total of enlistments in Nova Scotia, but accepting usual standards of the relation borne by military effectives to the total population, the 460,000 persons who form the population of Nova Scotia should furnish about 60,000 men of military fitness. A rate of enlistment of 13 per cent. would yield therefore from 7,000 to 8,000 recruits in the province. It is certain that nothing like this number of recruits has offered.

In considering Nova Scotia enlistments, however, it must be borne in mind that the young men of Nova Scotia have for many years been moving West, or to the New England States. It is probable that a dissection of the enlistments in Nova Scotia would show a relatively larger percentage of enlistments among Canadian-born men than is the case in the Western Provinces. This is naturally the case, because of the quite recent settlement of many parts of the Canadian West.

From the figures just recited, it is quite evident that the coal miners of Nova Scotia have proved their right to share in the general distinction that coal miners have achieved in this war. The record of the coal miners is strikingly summed up by Mr. Lloyd George in his speech on the question of munitions delivered in the House of Commons on the 23rd June last, from which the following extract is quoted:

"The way in which the miners have come forward to enlist in our armies voluntarily is one of the most

conspicuous exhibitions of patriotic sacrifice that has been exhibited by almost any trade in the country. I believe that about 224,000 of them are enrolled in our armies at the present day, and I was told by men whom I have seen at the front that no men have exhibited more desperate valor under trying conditions than the miners who have come from different parts of the country."

The rate of enlistment among the miners of Britain has been authoritatively quoted as being ten per cent., and it was found necessary in some of the colliery districts to discourage recruiting because of the consequent disorganization of the industry. The greater willingness of the married men to enlist has been characteristic of the recruiting among miners both in Great Britain and in Nova Scotia. This may be partly explained by the fact that the miner as a rule marries early in life. There is also, maybe, a subtler reason, and one that finds its source in the psychology of the miner's wife. The bravery of the miner's women folk needs neither emphasis or encomium to those who know them intimately, and in any meed of praise justly given to the miners of the Empire for their ready and willing response to recruiting appeals in every corner of that Empire, the brave part played by the miner's wife must not be forgotten.

The work of the coal miner develops certain characteristics that peculiarly fit him for the trench warfare that has played so great a part in the fighting in Flanders. One officer, in speaking of the miner's battalion, stated that the miner made a good soldier because of his ability to withstand cold and damp and fatigue, because of his "strong back," his understanding of excavation and the nature of ground, his familiarity with explosives, his "curious ear" for suspicious sounds, and his general contempt for danger. This officer remarked that miners did not make "parade soldiers," particularly in the case of the older men whose figures were set, but he did not think that the Germans had noticed the difference. In the matter of listening the miner should excel, as under working conditions his life will sometimes depend on his ability to correctly diagnose the meaning of sounds in the roof and timbers.

The use of poisonous gases by the Germans has brought another feature into the war that presents problems not unfamiliar to the coal miner.

OBITUARY

Mr. Aubrey white, Deputy Minister of Lands and Forests for Ontario was one of the best known forestry men on the continent. The late Mr. White was born in Ireland in 1845, but came to Canada as a young lad of seventeen, and engaged in the lumber business in Muskoka. His lumbering experience brought him in touch with the Crown Lands Department, and he became a Crown Land Agent, later entered the Forestry Department of the Ontario Government, where he eventually became Deputy Minister of Lands and Forests. He was an ex-president of the Canadian Forestry Association, and recognized throughout the continent as an authority on forestry problems and conservation matters.

ANNUAL REPORT OF MINISTER OF MINES OF BRITISH COLUMBIA FOR 1914

The Annual Report of the Minister of Mines for British Columbia for the calendar year 1914 has been issued. It is the most bulky and comprehensive report yet prepared by the provincial mineralogist, Mr. Wm. Fleet Robertson, and will doubtless be found very useful by all interested in mining in the province who shall peruse its contents.

In his letter of transmittal, Mr. Robertson makes the following comment: "The statistical tables give the total mineral output of the Province to date, and show in considerable detail the actual mineral production of the past year, as based on smelter or mill returns; also, a summary of the production of each of the last four years, thus illustrating by comparison the progress made in productive mining during this period. To facilitate comparison with information previously given, I have retained, as closely as was possible, the general form already established for such tables and for the report."

Total Mineral Production of British Columbia.

The first table shows that the total value of the mineral production of the Province for all years to 1914, inclusive, has been \$486,822,745, in the following proportions:

Gold, placer	\$73,269,603
Gold, lode	81,595,516
Total gold	\$154,865,119
Silver	37,709,282
Lead	31,468,462
Copper	86,939,370
Zinc and other metals	2,198,949
Total metalliferous	\$313,181,182
Coal and coke	149,814,462
Building stone, brick, etc.....	23,827,101
Total non-metalliferous	\$173,641,563
Total value of mineral production	\$486,822,745

Value of B. C. Production in 1914.

The value of the production of the year 1914 was \$26,388,825. This compares with \$30,298,398 in 1913, and \$32,440,800 in 1912. No other year than those two, however, had as high a value to its credit as did 1914. The decrease in 1914 was caused partly by a lessened production as a result of the war in Europe and to a smaller extent by lower average prices for the year of all the included metals except gold. Lower prices caused a decrease in total value, as compared with 1913, of \$1,170,117, or nearly one-third of the amount of the decrease. The quantities and value of the production in 1914 are as under:

	Quantity.	Value.
Gold, placer, oz.	28,250	\$565,000
Gold, lode	247,170	5,109,004
Total gold		\$5,674,004

Silver, oz.	3,602,180	1,876,736
Lead, lb.	50,625,048	1,771,877
Copper, lb.	45,009,699	6,121,319
Zinc, lb.	7,866,467	346,125
		\$15,790,061
Coal, tons of 2,240 lb.	1,810,967	6,338,385
Coke, tons of 2,240 lb.	234,577	1,407,462
Miscellaneous products		2,852,917
		\$26,388,825

The provincial mineralogist has included in the report an interesting summary of the progress of mining, a brief review of the work done during the year by himself, Mr. J. D. Galloway, assistant mineralogist, D. E. Whittaker, assistant provincial assayer, and by the Board of Examiners for coal mine officials; also reports by several mining engineers on parts of the province, the investigation of mining conditions and properties in which was specially assigned to them, respectively. The customary annual reports of gold commissioners and mining recorders occupy many pages, and these are supplemented by notes by the provincial mineralogist. The reports of the chief inspector of mines, Mr. Thomas Graham, and the district mine inspectors give much valuable information, and in this connection may be mentioned the information concerning progress in instruction among both metalliferous and coal miners in first-aid to the injured, the use of oxygen-breathing apparatus in mine rescue work, and the application of the pulmotor for automatic resuscitation. Another useful feature is the provincial mineralogist's review of coal mining, together with the reports of the district inspectors on individual collieries.

The reports of the several mining engineers, with the exception of that of Mr. J. W. Astley, on parts of Nanaimo mining division, had already been issued in bulletin form. Their inclusion in the Annual Report, though, contributes materially to its completeness. Mr. W. M. Brewer reported on Atlin, Queen Charlotte and Skeena mining divisions, the last-mentioned only in part. Mr. N. W. Emmens reported chiefly on Lardeau and Trout Lake mining divisions. Mr. A. G. Larson, who was assisted by Mr. C. S. Verrill, reported on the mineral and other resources of the North Fork of Kettle River, in Grand Forks mining division. The assistant mineralogist contributed a lengthy report on Omineca mining division along the Grand Trunk Pacific Railway from New Hazelton eastward, and notes on Cariboo and other parts of the province he visited during the year.

Numerous half-tone reproductions of photographs add greatly to the general attractiveness of this carefully prepared report. In particular those showing British Columbia mineral exhibits at the Panama-Pacific International Exposition are worthy of commendation, while views of parts of mining districts, and others of individual mining properties convey an excellent idea of local conditions. Maps and diagrams also add to the practical usefulness of the report, information in which is rendered readily accessible by a full and a carefully prepared index. The report may be obtained gratis on application to the Department of Mines, Victoria, B.C.

THE BUYING AND SELLING OF METALLURGICAL PRODUCTS

The Buying and Selling of Ores and Metallurgical Products is the title of Technical Paper 83, just issued by the Bureau of Mines. Charles H. Fulton, the author, says:

The buying and selling of ores and metallurgical products is a great and highly important business in the United States, and one that concerns not only the miner and the metallurgist but the industrial world in general. In this paper the attempt is made to outline clearly its underlying principles, the subject matter being based on personal experience and investigation. The author has endeavored to present the material impartially, and for that reason many of the statements and figures regarding metallurgical practice should be taken as illustrative rather than as applying exactly to average operating conditions. Moreover, the statements as to metal prices and trade methods are to be considered as applying to normal business, not to special conditions that have developed as a result of the war in Europe. As regards the style, technical words and phrases have been avoided as much as possible in order to make the paper easily understood by anyone who might be interested.

In estimating the value of an ore or an intermediate metallurgical product (other than a refined metal), the basis used is the price of the refined metal at some principal market centre, such as New York, at the time the valuation is made. The average price of all copper for 1913 was 15.5 cents per lb., and for electrolytic copper 15.269 cents per lb. The prices for other metals for the year 1914 were as follows:

Lead, 3.862 cents per lb.; spelter, 5.213 cents per lb.; silver, 54.811 cents per troy oz. Gold has the standard value, established by law, of \$20.67 per troy oz.

If the metal contents, in pounds for the base metals and in troy ounces for the precious metals, per avoirdupois ton be multiplied by the prevailing price of the refined metals, the sum of the products will be the gross value of the ore.

There is, however, a wide difference between the gross and the net value of a ton of ore. From the gross value must be deducted, first, the total cost of mining the ore, and then the total cost or charge for treatment, which includes some or all of the following items: Freight to treatment plant, milling or smelting charge, charge to compensate for losses of metal in treatment, charge for penalties imposed on undesirable constituents in the ore, charge for freight to refining centre, charge for refining the metal, charge to cover the selling costs of the refined metal.

Which of these charges are imposed and what the amount of each charge is depend on the ore, the method of treatment, and the number of firms that handle the ore and metals in the process from ore to refined metal.

The types of companies that handle ores and metallurgical products may be classified as follows:

1. Mining and smelting companies or mining and milling companies, which control all the operations from the mining of the ore to the production and selling of the finished metal.

2. Mining companies, which mine and sell ore on certain schedules to smelting or milling companies.

3. Custom smelters or mills which purchase ores and also operate refineries and produce refined metals or sell intermediate metallurgical products to refineries.

Concerns of type 3 may control mines that furnish a part of their ore supply.

4. Refining companies, which purchase metallurgical products, such as matte and crude metals and some ores, and produce refined metals.

5. Selling agencies, which place the refined metals on the market.

It is apparent that an ore or the products derived from it may go through many hands before the finished metal reaches the market, and that metallurgical business may be complex. In this report the essentials of the commercial side of metallurgical work are discussed in some detail.

Copies of this technical paper may be obtained free of charge by applying to the Director of the U. S. Bureau of Mines.

M. J. O'BRIEN.

Mr. M. J. O'Brien's activities in mining districts have made his name a familiar one to mining men. Our readers will doubtless be interested in the following appreciation which appeared in "The Financial Times" Saturday, July 31:

Among the many Canadians who have risen from comparative obscurity to a position of affluence and power through sheer ability and enterprise, the name of Michael J. O'Brien stands out prominently. Starting the battle of life at the early age of fourteen years, in railway construction work, M. J. O'Brien is to-day ranked among the leading capitalists of the Dominion.

Of Irish descent, his immediate ancestors having come from Waterford, Ireland, M. J. O'Brien was born in 1851 in Antigonish, where his father successfully conducted a store, and there he attended the Public School of his native town.

Starting work early, as already indicated, he successfully passed through every position in connection with railway construction work, such was his ability, industry and thoroughness, until finally he became superintendent of construction. From the pay-roll of another contractor to the establishment of a railway contracting business of his own, was the next step in the career of the man who was destined to become one of the most influential personages in the country. The qualities which had marked him out for advancement while working under supervision stood him in good stead in the launching of his first enterprise and he soon became known and recognized as a careful and thoroughly conscientious constructor of railways.

His first big work was undertaken in 1881 when associated with the firm of Messrs. Chisholm and O'Brien, this firm afterwards becoming M. J. O'Brien and Company.

From the inception the enterprising young Irish-Canadian met with success. He entered into contracts with many Canadian railway companies for construction work and during the boom times of such industry in Canada accomplished many gigantic tasks.

Among the railway enterprises with which Mr. O'Brien has been connected during his long and successful career may be mentioned sections of the National Transcontinental, the Canadian Northern Quebec, the Quebec, Montreal and Southern, the Quebec and Lake St. John, the Kingston and Pembroke, as well as many others.

The section of the National Transcontinental with which Mr. O'Brien was connected were some eight hundred miles in length, about half of the work being in the Province of Ontario and the other half in the Province of Quebec.

In the past twenty years or so other enterprises have attracted the attention of Mr. M. J. O'Brien and he has been uniformly successful in each of them. He is interested in mining and has large interests in gold mines in Nova Scotia and gold and silver mines in Mexico.

His greatest successes in the mining industry, however, have been in connection with properties in the Cobalt district. The O'Brien mine, which he owns, is generally considered to be one of the richest of the Cobalt properties. Mr. O'Brien has also extensive interests in the field around Gowganda. Amongst others he owns properties known as the Miller-Lake-O'Brien and Millerette mines.

Other enterprises of a more varied nature in which Mr. O'Brien is interested include timber limits in the Province of Quebec, one of them being 1,125 square miles in extent, including a water power on the Quinze River. He also owns and operates large farms located in Alberta, Saskatchewan and Ontario.

In addition Mr. O'Brien holds extensive interests in various industrial concerns scattered throughout the country.

The town of Renfrew, Ont., holds M. J. O'Brien in high esteem. In the days when success first smiled on him he made his home in that place, and has ever since retained a connection of a warmer character than that of merely a ratepayer and property owner, being heavily interested in the Renfrew Machinery Co., Limited, manufacturers of cream separators; Logan Brothers, Limited, producers of all manner of woollen goods, etc.

Mr. O'Brien is also an officer and director in many other companies including the Capital Trust Corporation, Limited, and Capital Life Assurance Company, of Ottawa; Deloro Mining and Reduction Company, Limited, at Deloro, Ont.; Strome Milling and Grain Co., Limited, Strome, Alta.; Great Lakes Dredging Company, Limited, Port Arthur.

Mr. O'Brien is associated at the present time in the construction of one of the most important sections of the Welland Canal.

Despite his many and varied activities Mr. O'Brien has found time to devote to the public interest. From 1902 to 1905 he was a commissioner of the Province of Ontario, and has held other public offices.

Particularly interested in the breeding of horses the Canadian National Bureau of Breeding, which aims at improving the breed of farm horses throughout Canada by an infusion of the blood of the thoroughbred, found a warm friend and supporter in him from its inception in the face of considerable prejudice and some opposition.

Mr. O'Brien is a member of the Engineers' Club of Montreal and the Ontario Club, Toronto.

He was married at Renfrew, Ont., in 1883 to Miss Jennie Barry, and has three sons and four daughters.

KENNECOTT COPPER CORPORATION.

The Boston Commercial recently printed information concerning the Kennecott Copper Corporation, which owns and for several years has been operating copper property situated in the eastern part of Alaska. The information follows:

During the four and a half years of existence of this company it has produced about 100,000,000 lb. of cop-

per. The average cost of production has been under 5 cents a lb., to be accurate 4.72 cents. This production has been chiefly from one mine, the Bonanza, which has been developed to the 600-ft. level. Since the first of this year the company has opened another mine, known as the Jumbo, and has increased the size of its concentrating plant.

President Birch, in discussing the matter, has been quoted as having said: "Our production of copper has been increased to about 5,000,000 lb. a month, or 60,000,000 lb. a year.

"We have taken over the Beatson copper mine, which is a low-grade property. More than 85 per cent. of the stock of the Beatson Copper Company is held in the treasury of the Kennecott Copper Corporation. This company has been in operation for more than four years; we have just completed construction of a concentrating plant and we estimate that the production from this source will be about 10,000,000 lb. of copper a year.

"We mine two grades of ore, namely, a high-grade pure chalcocite running about 70 per cent. copper, and a low-grade ore which averages about 12 per cent. We now have blocked out ore sufficient for six and one-half years. In deep vein mines, such as those owned and operated by the Kennecott Copper Company, it is not usual to keep blocked out more than two or three years' ore ahead of operations."

President Birch has supplied figures showing the production and net returns of the Bonanza mine during its four and a half years of operation. These figures show that since 1911, the year this property was acquired by the company; there has been produced nearly 90,000,000 lb. of copper which has been sold at an average price of 14.15 cents a lb. and has netted to the company \$8,121,000, as shown in the following table:

Year.	Production. Lb.	Average Selling Price. Cents.	Net Earnings.
1911	22,854,000	12.03	\$1,754,000
1912	24,319,000	16.19	2,766,000
1913	17,725,000	15.15	1,636,000
1914	17,200,000	13.54	1,250,000
1915*	7,836,000	13.21	715,000
	859,938,000		\$8,121,000

*First quarter.

"In 1913," said Mr. Birch, "the falling off in production was due to a suspension of mining operations owing to our inability to ship ore consequent on the destruction of the tramway terminal by fire. The curtailment in 1914 was due to the European war. From early in August of the latter year practically all the copper companies of the country were closed temporarily because of conditions resulting from the war. So far as our company is concerned a cutting off of five months' production was the result."

Mr. Birch stated further, that had the company been producing from the first of the year at a similar rate to what it is now doing, its output for the first quarter of 1915 would have been much larger than is shown above. He continued:

"Our bigger production dates from May 1. We have brought in the Jumbo as a producer and as a result our output has been more than doubled. At the Beatson mine there are available unusually favorable facilities for transportation. The mines are situated near the water's edge, so that the ore is loaded on to vessels without having to be taken over a railway, consequently there are not any railway transportation costs incurred."

OIL SHALES OF NEWFOUNDLAND

By J. W. McGrath.

Now that the use of coal as a fuel is fast giving place to oil in the navies, it is most opportune to ascertain to what extent oil exists in Canada and Newfoundland. The possibility of some port in British North American waters becoming a naval base for a British North American fleet adds still more to the importance of this subject.

In recent Geological Surveys of Canada and Newfoundland, proof of the existence of extensive quantities of oil shale has been found. Mr. Harold C. E. Spence, who recently made a very close study of the oil shale fields of Newfoundland and Eastern Canada, has stated, "Having regard to the importance attaching to the obtaining of large supplies of oil fuel for the navy from sources under the British flag, and the comparatively few localities where such sources exist, it is considered of great national importance to preserve for the Empire such areas of oil shale as are found to contain sufficient volatile matter to prove workable. . . . In Newfoundland and parts of Eastern Canada some billions of tons of payable oil shales are assured and some hundreds of millions of tons are known to contain a far greater percentage of oil to the ton than the shales of the successfully operated Scotch fields. There is, therefore, a reasonable hope of a very important industry being inaugurated in the extraction and the refining of oil and by-products from these shales in the near future."

In Canada the most authentic reports would indicate that the shale bearing areas are largely confined to the eastern provinces. In New Brunswick there is no doubt as to the existence of shale fields that could be profitably worked. Several specimens of these shale deposits have been analyzed. In some cases the yield of oil to the ton has been as high as 40 gallons, whilst an average of 30 gallons to the ton has been extracted from several deposits which are commercially workable.

From Scotland a very valuable lesson might be learnt. About 1865 the scarcity of oil in Europe became problematical, for the old sources of supply were becoming exhausted. The Scots experimented with their shale deposits, which were found workable. Year after year the industry became greater by a constant enlargement in the capacity of the plant, till now the annual output of oil reaches sixty million gallons. The Admiralty have made with the companies operating in Scotland contracts in perpetuity; and yet the richness of these deposits does not in any way approach those of Canada and Newfoundland. The average yield is about 25 gallons of oil to the ton. Besides the oil, by-products are also produced. These include ammonium sulphate, paraffin wax, naphtha, creosote, etc.

The shales of New Brunswick are of two distinct types. One is known as "paper shale" and appears in extremely thin formation, the other occurs in solid bodies, and almost black mass, possessing elasticity. This variety gives about 55 pounds of ammonium sulphate to the ton of shale. Some of these beds as they occur are of an enormous thickness, some running up as high as from eight to eleven hundred feet. The Geological Survey says: "In these Canada possesses a source of mineral wealth, the great value of which, if properly developed, can scarcely be overestimated."

In the Province of Quebec, at Gaspé, other oil shales occur. These are distinct altogether from those of Nova Scotia and New Brunswick, being of the upper Devonian area, and somewhat allied to the shale formation of Newfoundland.

The existence of bituminous formations in Newfoundland was not known till 1911. At least the extent and quality of the deposit was not known until then. A specimen of Newfoundland shale exhibited at the Festival of Empire attracted the attention of Mr. Smith Everett, an English scientist, who has specialized in shale analysis. Mr. Everett at once came to Newfoundland on behalf of the Anglo Carbon, Oil, Asphalt and Bitumen Company, and made a thorough investigation of the shale areas. The areas, according to Mr. Everett's report, were traced for thirty miles. Analyses which he made showed samples which easily produce 40 gallons of oil to the ton. The shale is impregnated with petroleum, and besides yielding the ordinary by-products common to most shales gives an allotrope of asphalt which is marked commercial demand. These deposits which is in marked commercial demand. These deposits wells. The oil wells drilled yielded to the pumps about 10 gallons of oil each day.

NATURAL GAS INDUSTRY IN THE APPALACHIAN REGION.

The market production of natural gas in the States of New York, Pennsylvania, West Virginia, Ohio and Kentucky in 1914, amounted to 425,871,728 thousand cu. ft., having a total value at the point of consumption of \$73,677,641, or an average value of 17.3 cents per thousand cu. ft., according to statistics compiled under the supervision of J. D. Northrop, of the United States Geological Survey. Compared with 1913 the output of natural gas credited to these States shows a slight increase, amounting to 608,480 thousand cu. ft., less than 2/10 of one per cent.; whereas, the value of the production shows a substantial gain, amounting to \$4,359,537, or a six per cent. increase.

The gain in output is credited chiefly to Ohio, though New York gained slightly, the increase in these States being more than sufficient to offset the decline in Pennsylvania, West Virginia and Kentucky. The increased output of Ohio is credited chiefly to Cuyahoga County, where a gas field of considerable importance was developed in Cleveland and its suburbs as the result of discoveries made late in 1913. Unfortunately the value of the field was enormously discounted by the frenzied drilling campaign which characterized the development, and resulted in the close placing of wells with the obvious consequence of a rapid draining of the supply and a very short productive life for individual wells.

[The following poem was written especially for The New York World, by the author of "Gott Mit Uns," the poem that won the recent students' prize at Harvard University, and aroused a storm of adverse criticism from Germans.]

FINIS.

By C. Huntington Jacobs.

Ye have not scorned to cry to us for aid;
Ye have not scorned to cling about our knees
When to our gracious havens, sore afraid,
Ye bore our victims from your piracies.
Nor have ye scorned upon the open seas—
So well by such as ye is ruth repaid—
To wreck with slinking death our argosies,
To treat as vile our ensign full displayed.

In the pride of utter insolence,
Your coiled water-snakes, athwart our path,
Fasten their fangs upon our innocents—
Yea, with an hundred murders mock our wrath!
Oh, if our spirit liveth, ye shall feel
What might our vengeance hath in flame and steel!

GOVERNMENT PUBLICATIONS

By R. W. Coulthard.*

In that Year of Grace, 1909, there came into being, as a branch of the Geological Survey of Canada, a Topographical division. At the time (well do I remember), I, as one of many, hailed and acclaimed this departure from the hitherto staid and early Victorian policy of the Survey as a decided effort and stride toward that reformation of its future procedures for which we had long and valiantly prayed. Here at last the rumbling old chaise was being dragged out of its deep, miry and far-drawn rut of somnolent mediaevalism; hereafter it would travel the hard, smooth macadam of wakeful modernity. All hail!

Many times and oft had I looked and longed for those topographic sheets, but in vain. Well, we knew that they were in preparation and that within a few days, a few weeks at most, they would arrive in the familiar sealed packet "on His Majesty's service," but graciously intended for ours.

That, patient reader, was in the days of yore and, as I look back in retrospect through the intervening aeons of time, this looking and longing images itself before my tired gaze in composite form like unto that of a visionary, vapid and vicarious mirage. 'Tis there! Eheu! 'Tis gone!—drifted into thin air—and we stare helpless at the cerulean loveliness of an empty sky.

Up to the present, my enquiring friend, the Topographical Branch has been almost impetuous in its strenuosity. According to the Survey reports, provided I have missed none during my diligent searching, this branch has completed and mapped at least 34 (thirty-four) sheets, which are comprehensive of a range extending from the habitat of our dour Scottish blue-nosed friend to that of the exuberant "Sons of the Midnight" variety—34 completed and mapped; very creditable, beloved co-workers. But of these 34 how many have been printed, published and distributed? As far as I can manipulate the formulae provided in the Index, I have figured but 9—N-I-N-E—9 from 34, let me see, that leaves 25—25 all lying in Ottawa in a state of stagnant security. Let me enumerate:

9 published: 1, Victoria Sheet; 2, Saanich Sheet; 3, Nanaimo Sheet; 4, Sooke Sheet; 5, Prescott, Paxton Lake and Lake Mines (Texada) Sheet; 6, Deadwood Sheet; 7, White River (Yukon) Sheet; 8, Beavercreek Sheet; 9, Orillia Sheet.

25 mapped but unpublished: 1, Duncan Sheet; 2, Cowichan Sheet; 3, Alberni Sheet; 4, Slocan Sheet; 5, Flathead Coal Area Sheet; 6, Sooke Peninsula Sheet; 7, Lillooet Sheet; 8, Windermere Sheet; 9, Crow's Nest Sheet; 10, Flathead District Sheet; 11, Revelstoke Sheet; 12, Van Anda (Texada Isl.) Sheet; 13, Rainy Hollow (Yukon) Sheet; 14, Blairmore Sheet; 15, Sheep Creek (Alberta) Sheet; 16, Athabaska Sheet; 17, 18, 19, 20 and 21, 5 Lake Simcoe Sheets; 22, Thetford Sheet; 23, New Glasgow Sheet; 24, Moncton (N.B.) Sheet; 25, St. John (N.B.) Sheet.

Surely a goodly array; look—and marvel.

The distant warblings of that ubiquitous and irrepressible little bird reaches me and I glean that this self-same Topographical Branch has cost the patient, hard-working ratepayer of this fair and unfair Dominion of ours \$180,000 (one hundred and eighty thousand) bright golden dollars. One of the first essentials, next to his proverbial modesty, of the engineer is succinctness, so here it is:

\$180,000.00

————— = \$20,000 per

9

I am assuming that the remaining 25 have been lost in the shuffle and turmoil of governments and things; but, indeed, should the industrious janitor or some other mighty functionary discover them from some dusty, musty and moth-infested recess by way of the old and conventional perchance upon the hidden spring of the secret panel, they will be unearthed or unpanelled or something, and doubtless we will then be served at large and small. Some of them, it is true, will at this late date be antiquated and will exhibit woeful variance from the actual, as the arts of man will in the meantime have changed many of the featural markings of the maps; but, my goodness, they, at least, will have been printed and doled out to the long-suffering and patient. Noblesse oblige. So there you are.

We engineers in this effete but struggling West certainly appreciate to the full the importance of the Topographical Division. We are constantly calling for topographical maps. We need them in our business, so to speak, even as much as the Geological Branch of the Survey does in theirs. We remember, all of us, cursingly we remember, the inefficiencies of the old methods employed in the days of Chaucer and Rameses, those sylvan, halcyon days, when the geologist armed with pedometer and field-glass was wont to sally forth to map the ups and downs of his Mother Earth, its hills and rills, and having mapped them would place thereon the fruits of his geologic lore. And how often, tolerant reader, would we of the purely sordid school of science, in the drudgery of our daily task, find the downs where the ups should be, and the rills where the hills. Delightful, happy memories.

No, gentlemen, we now have the means, and for the sake of heaven let us get our maps, topographic and otherwise, and more of them; but let us have them when they will be useful to us. These delays are most disheartening.

Can you stand some more? A case in point; let me narrate:

Last fall, I think it was, some one of unsound mind and principle issued most remarkable statements concerning the silver hoards of the Athabaska Lake region—samples and all to prove it, mind you, and most extraordinarily of semblance like unto those of Cobalt fame, most extraordinarily—significant in fact. Upon the strength of these unhallowed remarks some scores and forties of men were lured into that inhospitable country during the winter and early spring; even the wild geese hadn't attempted it yet. Where was I? Oh, yes—early spring. Well, a geological party had spent the season of 1914 in the region north of Athabaska lake, emerging, I think, in October. The first intimation I have seen of the results gleaned from this expedition appeared in the Summary Report, which has just been let out to the undeserving public, and this is July, 1915. In my opinion, had a monograph been printed and distributed last fall the enthusiasm of the treasure seekers might have been tempered and much useless expenditure of time, money and most unprintable language been averted. But, no; that is not our system.

Other and many like instances could I recount from

*Mining Engineer, Calgary.

my vicissitudinous career in this western clime, but sufficient.

What we want, gentlemen, are monographs printed at a time when the information will be of some service, with topographical and geological maps to follow forthwith; I said forthwith.

Furthermore, and now that I am seeing red it is my privilege to run amok, what of the testing laboratories of the Bureau of Mines? We in the West are witnessing a most distressing crisis in the history of our coal mining industry. It is true that concerted action along reasonable lines, and upon the part of the operators, will alleviate this situation to a marked degree; but there is also relief to be looked for and expected in the extended and more scientific utilization of the coals. Why is not an experimental plant installed in Alberta, where it can keep in intimate touch with the industry and operator instead of in some academic background in the East, where its usefulness has been of such a practical nature that I cannot conjure up one improvement, due to it, having been developed in any western plant? They should establish themselves where the trouble is and keep hammering new ideas into those who should be interested, but who are loath to imbibe ideas which they take to be purely academical.

There are new and improved methods of utilizing the coal direct.

There are recent improved methods of gasifying coals, one of them—the Vignon catalytic method—claiming to produce from 8 to 10 times more gas than can be evolved and utilized by any ordinary retort procedure.

There are the various by-products to be garnered in from the waste of our coke ovens and coal burners of all descriptions.

There is a wide, wide field, plenty of scope, and the time is opportune; but it is here, in Alberta, that the useful field of operation lies only, and it is paramount to a crime if the department does not lend an assisting hand at a time when our coal industry is in such a condition of languishing decrepitude. Up to date about the only interest our eastern friends have taken in our western coal industries has been developed along the lines of collecting coal royalties. These have mounted up to very tidy sums, and the West now demands some returns.

MINE ACCIDENTS IN BRITISH COLUMBIA.

The quarterly statement of Coal and Metal Mine Fatalities in British Columbia for the second quarter of 1915, compiled by the Chief Inspector of Mines, shows that the number of men killed at coal mines was 23, as compared with one in the corresponding quarter of 1914, and at metal mines 6, against 9 in the same period of 1914. For the six months ended June 30, 1915, the total fatalities were 45 in and about coal mines, as compared with 9 in 1914, and 8 in and about metal mines, against 14 during the corresponding half year in 1914. The considerable increase in loss of life at coal mines this year is attributable to two disasters, namely, the flooding of one of the Pacific Coast Coal Mines Company's mines at South Wellington, Vancouver Island, in February, which caused the loss of 19 lives, and a gas explosion at the Western Fuel Co.'s Reserve mine, near Nanaimo, V.I., in May, when 22 lives were lost. Of the remaining four fatalities that occurred at coal mines this year, three were at the Cumberland mines of the Canadian Collieries (Dunsmuir), Limited, and one at the Crow's Nest Pass Coal Co.'s Coal Creek colliery, Southeast Kootenay. Of

the eight deaths at metal mines this year, one occurred at the Queen mine, in Nelson mining division; two at the Consolidated Co.'s mines at Roseland; three at the Granby Co.'s mines, Boundary district; one at Nickel Plate mine, Hedley; and one at the Britannia mine, in Vancouver mining division.

WORLD'S PRODUCTION OF PETROLEUM IN 1914

The quantity of petroleum entering the markets of the world in 1914 amounted to 400,483,489 bbls, according to statistics compiled under the supervision of J. D. Northrop, of the United States Geological Survey.

Of this record-breaking output the United States is credited with 66.36 per cent., representing in quantity a trifle less than double the output of all the other oil producing countries combined.

Changes in rank during the year affected only Japan and Peru, the former superseding the latter by a narrow margin.

The following table shows the marketed production of petroleum in the world in 1914:

Country.	Production, Bbls. of 42 gals.	Per cent.
United States	265,762,535	66.36
Russia	67,020,522	16.74
Mexico	21,188,427	5.29
Roumania	12,826,579	3.20
Dutch East Indies	a12,705,208	3.17
India	b8,000,000	2.00
Galicia	b5,033,350	1.26
cJapan	2,738,378	.68
Peru	1,917,802	.48
Germany	b995,764	.25
Egypt	777,038	.19
Trinidad	643,533	.16
Canada	214,805	.05
Italy	39,548	.01
Other Countries	d620,000	.16
Total	400,483,489	100.00

aIncludes British Borneo. bEstimated. cIncludes Formosa. dIncludes 600,000 bbls. produced in Argentina.

THE ELDER DAUGHTER.

(Written in Canada by B. F. Griffin, in Boston News Bureau.)

Your premier sits as an equal there
 In the homeland's council hall,—
 A token of your unstinted share,
 At the Empire's call.
 To your premier, ere he home depart,
 Gives London her ancient key,—
 For new deep place in the Empire's heart
 That you hold in fee.
 You of the wide unwalled frontier
 And the fleetless lake and stream,
 Absorbed in your task of the pioneer
 And your youth's high dream.
 With never a foe or a feud to fret,
 Hands trained but to axe, helm, plow,
 You (thought the plotters) would fain forget,—
 They are answered now!
 From sea to prairie and western wood
 Dropped are plow and axe and helm,
 For the greater duty understood,
 For the greater realm!
 Mistress, indeed, of your own wide sill—
 But if scorner, sceptic, spy,
 Dare doubt you are dutiful daughter still
 Let Ypres reply!

BUSINESS REVIVAL ON MICHIGAN IRON RANGES

By P. B. McDonald.

After one of the dullest periods for years, the Lake Superior iron ranges are now enjoying an increase in business that is much appreciated in the mining towns scattered through northern Michigan and Minnesota. In spite of the full stock-piles seen at many of the iron mines during the first half of the season, and though handicapped by a backward beginning, it is hoped the present revival in the iron and steel trades will swell the output of ore for the season to 40,000,000 tons. This is considerably more than went down the lakes last season, but not near the record mark of over 50,000,000 tons reached in 1913.

Anticipating a better demand for ore, the Cleveland-Cliffs Iron Co., one of the largest of the "independent" producers, operating a dozen mines, mostly on the Marquette range, has raised the wages of its employees to the old standard in force previous to October, 1914. In the recent "boom" district of Iron River, on the western Menominee range, the fifteen mines operating there are employing 2,000 men, which is a great improvement over a few months ago.

Pickards, Mather & Co., operating under the name of the Verona Mining Co., is the largest employer in the Iron River district; at present it has about 300 men at its Caspian mine and is reopening its Bengal property. The Munro Iron Mining Co. is maintaining medium sized forces at its Rogers, Hiawatha and Chicago mines; the Munro Co. is a subsidiary of the Rogers-Brown interests of Buffalo, N.Y.

The U. S. Steel Corporation's holdings at Iron River are confined to the Dobar mine, which is employing 180 men, and the McGillis development, where new buildings have been finished preparatory to the property entering the ranks of the shippers.

Wickwire Steel Co., also of Buffalo, is shipping from its new Homer mine. Corrigan, McKinney & Co. has a good sized force at the Tully mine, where an electric pump was recently installed, and may also reopen the Baker mine adjoining. The Jones & Laughlin Co. is employing about a hundred men at its Forbes mine. The Zimmerman mine, named from the late Col. Eugene Zimmerman of Ohio, one of its owners, has a force of 150 men; and Oglebay, Norton & Co.'s Chatam mine has about an equal number; as has the Davidson mine also. The James and Bates mines are going light as yet.

The Michigan State Geological Board, which each year re-values the mines of Michigan for taxation purposes, has completed its 1915 survey, and announces a total for the three Michigan iron ranges of \$89,757,607, which is nearly two million less than a year ago. The reduction is mainly due to the low prices of iron ore prevailing last year, since according to the Findlay system of appraisal the worth of a mine's ore reserves is computed by using the average price of ore for the five years preceding the assessment, so that a year of low prices materially reduces the estimated present value of ore in the ground. An additional factor in the lowering of the total valuation is the gradual exhaustion of several of the famous old mines of Michigan. Thus the once-active Lake Angeline mine of Jones & Laughlin at Ishpeming has its orebodies depleted, the big Pewabic mine at Iron Mountain has used up its high-grade ore and is only to be reckoned

as an irregular low-grade producer—active when there is a market for low-grade ores, the steady old Hemlock mine of Pickards, Mather & Co. at Amasa is no more, and the hard ore mine at Republic, recently sold by Cambria Steel Co. to the Cleveland-Cliffs Iron Co., while still an active producer, is much reduced in proved ore reserves, and consequently in valuation. The largest single mine assessment in Michigan is the Newport mine at Ironwood, appraised at over \$8,000,000. The Norrie "group" of the Steel Corporation, also on the Gogebic range, is assessed at nearly fifteen millions.

Ferdinand Schlessinger, of Milwaukee, owner of the Newport mine, returned from a European trip a few weeks ago; as his name indicates he is rather pro-German in his ideas.

The assessment of the iron mines of Michigan by counties was as follows: Gogebic, \$34,572,110; Marquette, \$28,616,453; Iron, \$20,856,919; Dickinson, \$5,906,443. The Findlay method of appraisal of mines, established in Michigan under the direction of J. R. Findlay, mining engineer, disregards a mine's equipment as of no value aside from its use to extract the orebody.

MINES INCREASING OUTPUT IN ARIZONA.

In Arizona the majority of copper mines were affected by the European war, and curtailment in output was practised by many large producers. All of the copper smelters operated at reduced capacity, and one of the plants at Clifton was closed until March, 1915.

V. C. Heikes, of the United States Geological Survey, now reports conditions improving, and all copper plants brought to full capacity, with two new smelters blown in during May. One of these, the Clarkdale smelter, will possibly eventually take the place of the old smelter at Jerome for the treatment of United Verde ores. While the new International smelter at Miami is built primarily for Inspiration mine concentrate, it is likely to be in the market for outside product. By this new addition, the copper output may be increased slightly but will probably not exceed the record figures of 1913, when 407,923,402 lb. of copper were produced.

Navigation on Yukon River was formally opened for the 1915 season on June 1st when two steamers sailed from Whitehorse for Dawson, Eagle, Ruby, Fairbanks, Iditarod, Tolovana, Nome, and other northern places. The Yukon was by that date open its full navigable length, and several boats had already reached Dawson with gold from Fairbanks. On June 5th the packet Sarah left Dawson for Nome, most of her passengers having gone from Seattle, Washington, via Skagway and Whitehorse, to Dawson in time to catch the first through boat to Nome. Hereafter a steamer will leave Whitehorse for down-river parts every other day.

—Sergeant. " 'Ere, Brown, what are you knockin' your 'orses about for?"

Brown. "Please, Sergeant, they're always 'angin' back. If it wasn't for them two bloomin' 'orses we'd 'a' bin in Berlin months ago."—Punch.

Reports from Germany say the enormous canned food industry is suffering from lack of tin.

MINERS' UNIONS IN CANADA*

The present article aims at giving in brief outline a view of the general line of policy and methods of labor organizations operating in Canada in the mining industry, so far as these may be gathered from information which has been generally accessible to inquirers. As is now well understood by those who in Canada are interested in following the course of labor organization, the conditions of this country in this matter are essentially interwoven with those of the United States by means of a system of unionism which may be described as highly internationalized. The organizations embracing different branches of the mining industry in Canada are, like other trades unions here, largely, though not exclusively, international, and it will be convenient to allow any discussion on the subject here undertaken to range not only over conditions and events in Canada, but to some extent over those also of the United States.

There are two important international bodies comprising the bulk of organized labor in the mining industry on either side of the boundary line, namely, the United Mine Workers of America, embracing workers in coal mines, and the Western Federation of Miners, embracing workers in metalliferous mines. Both these organizations are international, as stated, and have active branches in the Dominion. In Canada there is, besides, an organization not international in character, which has a considerable membership among the coal miners in Nova Scotia, and does not elsewhere exist. In the United States, so far as known, there is no organization devoted to coal mining other than the United Mine Workers of America. The Western Federation of Miners is the only organization which, so far as known, operates among metalliferous workers. It is of course possible that in the United States here and there a local union may exist including members who are working at one or other of these callings, but the union will not in such a case be one known to labor organizers generally; in the same way there are one or two purely local unions in Canada, though not so far as has been learned, any which would naturally include followers of any branch of the mining industry.

Records of both the international bodies named have been marked by turbulence to a degree hardly equalled perhaps in the case of any other organization, this condition resulting in large measure, no doubt, from the fact that the membership is composed of men of many nationalities and languages, a considerable proportion of it, moreover, particularly among the lower classes of labor, being illiterate. The rough and unpleasant character of their work has not conduced to gentle-handed methods on their part when they have been engaged in what they have believed sometimes to be a life and death struggle. An interesting illustration of the cosmopolitan nature of the union, which includes a large but fluctuating and uncertain proportion of workers in the coal mining industry, namely, the United Mine Workers of America, is the decision of the executive committee of that organization to print the official weekly journal—the United Mine Workers' Journal—in three languages, the English, Italian and Slav, representing not of course all, but the predominating tongues of the workers.

It will not be possible within the limits of this article to treat exhaustively of all or any of the various

phases and aspects of the work of these important labor organizations. An effort will be made, however, to indicate something of the leading phases of the scheme of organization, and some general information will be given with reference to the more important of the disputes in which they have been involved. In Canada, disputes which have arisen in the mining industry have fallen within the scope of the Industrial Disputes Investigation Act, since the enactment of that statute on March 22, 1907. In a number of cases, however, the machinery of the statute was not brought into operation until after the disputes had developed into strikes, and in some highly important instances the machinery of the statute was not utilized at all, neither the mine operators nor the employees calling for a board, and the statute not otherwise permitting the establishment of a board. Numerous investigations of considerable importance took place, however, before boards established under the terms of the Investigation Act, the employees concerned being in each case largely of one or other of the organizations named. Several investigations also have taken place in the United States, usually before commissions, the commissions having been generally appointed by the President of the United States, and having powers not far removed from those of Boards of Conciliation and Investigation established under the Canadian law; a board or commission in either case has not had legal authority to compel the acceptance of its findings. Perhaps the most notable inquiry made under the authority of the United States Government was that having to do with the great strike of the anthracite coal miners in 1902, wherein the dispute was referred to a board of arbitration appointed by the President of the United States, both parties having agreed to abide by the findings of the commission.

The organizations to be considered, therefore, are the following:

1. **The United Mine Workers of America**, an international body with a total membership exclusively among workers in coal mines, estimated at the end of the year 1914 at 328,473, including a membership on the Canadian side of the boundary estimated at 4,483.

2. **The Western Federation of Miners**, an international organization confined to workers in metalliferous mines, with a total membership placed at the end of 1914 at 65,400, including the Canadian membership estimated at 4,015.

3. **The Provincial Workmen's Association of Canada**, a body with a membership confined to coal miners in the Province of Nova Scotia, and estimated at the end of 1914 at 5,000.

It may be noted that for a number of years there has been a movement on foot to bring together by amalgamation the international unions covering coal and metalliferous miners. Both organizations are reported to be favorable to the plan of consolidation, the consummation of which would make an organization of approximately 600,000 members, the largest single body of organized labor in the world. The relations between the U. M. W. A. and W. F. M. have not always been friendly. In 1904 the United Mine Workers discontinued the interchange of cards with the Western Federation owing to the severe criticisms of the policy of the then president of the U. M. W. A., Mr. John Mitchell, by The Miners' Magazine, published by the federation, and of

*Extracts from the Fourth Annual Report of the Department of Labor. Ottawa.

President Moyer, of the W. F. M. Of late years, however, the two organizations have been on more amicable terms, and the interchange of transfer cards has been re-arranged. The three organizations will be considered separately.

United Mine Workers of America.

Previous to the advent of the United Mine Workers of America several attempts had been made to organize unions of mine workers, but each effort to found a permanent organization met with failure. As early as 1849 a union of mine workers was formed in the anthracite coal region of the United States by an Englishman named John Bates, but this body was short-lived, as were several other unions of a local character.

In 1861 an organization called the American Miners' Association was established in Illinois, and gradually extended its operations to the Eastern States, but the association, owing to a number of unsuccessful strikes in 1867 and 1868, collapsed in the latter year. In 1869 a union known as the Miners' and Laborers' Benevolent Association was organized in the anthracite coal fields. This organization grew rapidly and maintained an existence until 1875. In this year a general strike was inaugurated which closed nearly all the mines in the region, but, owing to the opposition of the mine owners and to internal dissensions of a varying nature, the strike failed, and the organization was destroyed.

During the period in which the Miners' and Laborers' Benevolent Association was operating in the anthracite region the Miners' National Association was thriving in the bituminous coal fields of the United States. In the year 1874 its membership exceeded 20,000, but the union shortly went to pieces.

Following the dissolution of these organizations the Knights of Labor came on the scene, and for a time its growth was rapid in both the anthracite and bituminous regions. The influence of the Knights of Labor, however, began to wane with a diminishing membership and, by 1885, the power of the organization had passed. In that year the Miners' National Progressive Union was formed, and was apparently more successful in the bituminous coal fields than any of its predecessors, trade agreements with the operators having been established in a number of localities. Constant friction with what remained of the Knights of Labor organization hampered the influence of the union, and by 1890 its membership had dwindled to such a degree that it became apparent that in order to maintain a successful organization of the mine workers it would be necessary to secure the consolidation of the remnants of the Miners' National Progressive Union and Assembly No. 135 of the Knights of Labor, which claimed jurisdiction over the men employed in the coal mines. On January 25, 1890, this amalgamation was effected, forming what is now known as the International Union United Mine Workers of America. Almost from the inception of this new body it became affiliated with the American Federation of Labor.

The objects of the United Mine Workers of America are set forth as follows in the constitution effective April 1, 1914:

"First—To unite in one organization, regardless of creed, color or nationality, all workmen eligible for membership, employed in and around coal mines, coal washers and coke ovens on the American continent.

"Second—To increase the wages, and improve the conditions of employment of our members by legislation, conciliation, joint agreements, or strikes.

"Third—To demand that not more than eight hours from bank to bank in each twenty-four hours shall be worked by members of our organization.

"Fourth—To strive for a minimum wage scale for all members of our craft.

"Fifth—To provide for the education of our children by lawfully prohibiting their employment until they have at least reached sixteen years of age.

"Sixth—To secure equitable statutory old-age pension and workmen's compensation laws.

"Seventh—To enforce existing just laws and to secure the repeal of those which are unjust.

"Eighth—To secure, by legislative enactment, laws protecting the limbs, lives and health of our members; establishing our right to organize; prohibiting the use of deception to secure strike breakers; preventing the employment of privately armed guards during labor disputes; and such other legislation as will be beneficial to the members of our craft."

Scheme of Organization.—It will be of interest to examine some of the more important features of the constitution of the U. M. W. A., involving its scheme of organization and the powers vested in the various officers and branches of the union.

The organization, which is essentially industrial in character, including in its membership all craftsmen who are employed in and around coal mines, is administered through a system of districts, sub-districts and local branches, all of which must be chartered by the international union. The officers of the international union consist of president, vice-president, secretary-treasurer, three tellers, three auditors, the delegates to the American Federation of Labor, an international executive board consisting of one member from each of the districts over which the U. M. W. A. has jurisdiction, together with the president, vice-president and secretary-treasurer. All elective officers, with the exception of the executive board members, are elected biennially by referendum vote of the whole membership; executive board members are elected by the votes of the members in their respective districts.

Among the duties of the president is that of appointing a member to collect and compile statistics on the production, distribution and consumption of coal and coke, freight rates, market conditions and any other matter which may be of benefit to the organization. The president may also appoint organizers and other officials, including traveling auditors, to examine the accounts of the local branches, such officers to be agreed upon by the districts and international union, who jointly bear the expense; he may also grant district or territorial dispensations relating to initiation fees, when in his judgment such dispensations will add to the growth of or conserve the interests of the organization. The calling of special international conventions is vested in the president, when so instructed by the International Executive Board, or upon the request of five or more district unions. The salary of the president is \$4,000 per annum and expenses.

The vice-president works under the instructions of the president and the International Executive Board, and in the event of the presidency being vacated by resignation or otherwise, the vice-president succeeds to the position. For his services he receives \$3,300 per annum and expenses.

The secretary-treasurer, who is bonded to the extent of \$25,000, in addition to receiving and disbursing the funds of the organization, is required to submit to all local branches a semi-annual statement, and to per-

form such other duties as may be assigned by the president or international executive board. The salary is \$3,300 and expenses. The president, vice-president and secretary-treasurer are required to render reports of their stewardship at each biennial convention.

The International Executive Board, which is convened on order of the president, or by the secretary-treasurer at the request of a majority of the members thereof, is required to execute the instructions of international conventions, and between conventions has the power to direct the affairs of the organization. The board may levy and collect assessments, but no such assessment shall be for a longer period than two months, unless authorized by a referendum vote. Money deposited by the secretary-treasurer in the name of the Executive Board can only be drawn upon the order of two-thirds of the members of the board. The Executive Board has power between conventions and, by a two-third vote, to recommend the calling of a general strike, but under no circumstances may such a strike be called until approved by a referendum vote. When a roll call vote is demanded on any question before the Executive Board, each member is entitled to one vote and one additional vote for each 2,000 members in good standing which he may represent. Where a unit vote only is taken, the three resident members at Indianapolis, the headquarters of the organization, are entitled to vote. The president has the casting vote where the roll call vote results in a tie. When the board is not in session the individual members are subject to the direction of the president. The salary of an Executive Board member is at the rate of \$125 per month when employed.

The regular conventions are held biennially on the third Tuesday in January, representatives to be elected directly from the local branches they represent, and to be entitled to one vote for one hundred members or less, with an additional vote for each hundred members with a maximum of five votes. Local branches organized one year prior to the date of holding a convention, and having one hundred members or more in good standing, must be represented in the convention or pay a fine of \$25 for each one hundred members in good standing, unless exonerated by the International Executive Board. Exception to this rule is allowed where the members of a local have been idle for one month or more prior to the convention on account of strikes, suspensions or closing of mines. Local branches with less than one hundred members may combine with similar locals within a reasonable radius in the same district and elect delegates to represent them, but no delegates so elected shall be entitled to more than five votes. No local branch if in arrears for per capita tax or assessments is entitled to representation at a convention. New local branches are not entitled to representation unless organized three months prior to a convention, except where such branches are composed of members of old branches in good standing at the time the new one was organized. Delegates must be members employed in or around a coal mine, coal washer or coke oven, or in the employ of the organization, and regular attendants of the meetings of the local. Members accepting positions other than as mine workers, except with the U. M. W. or an affiliated organization, are not eligible as delegates. The international organization pays for the transportation of delegates to and from the conventions on a basis of one delegate from ten to five hundred members and one additional delegate for each additional five hundred

members or fraction thereof, provided such fraction is not less than twenty-five members. The revenue of the international organization is derived from charter fees, a per capita tax of 25c. per month, with such additional assessments as may be levied by an international convention, referendum vote, or as may be authorized by the International Executive Board.

District unions are composed of the local branches in the territory allotted, and have power to adopt such laws for their government as do not conflict with the laws of the international union or joint agreements. Sub-districts may be formed with the same rights and privileges as are enjoyed by district unions. The local branches comprising the district are under the control of the district union. The officers of a district union, who are elected by referendum vote, consist of one president, one vice-president, one secretary-treasurer and a board of five members, the whole constituting an Executive Board. This Board meets every three months, but special meetings may be called. District unions have the power to collect per capita tax and to levy and collect assessments from its own members when necessary, but such assessments must not exceed \$1 per member per month. The district officials are compensated in such manner as the district union decides, the conventions of which are held annually.

Membership Qualifications, Initiations, Fees, Dues.—The laws governing local unions provide that local branches shall be composed of ten or more workmen, skilled or unskilled, working in or around coal mines, coal washers, or coke ovens, each local branch having jurisdiction over one mine. Mine managers, top foreman, operators' commissioners, persons engaged in the sale of intoxicating liquors, and members of the Civic Federation or Boy Scout movement are declared not eligible for membership.

The international constitution provides that, unless a dispensation has been granted by the president, the initiation fee for practical miners is \$10, the fee for inexperienced miners and top and bottom men is subject to the laws of the respective districts. The initiation fee for members' sons between fourteen and seventeen years of age is \$2.50. Members wishing to attend school as pupils are granted leave of absence, and on returning to work in the mine are admitted to membership without any further payment of initiation fee. Members working in non-union mines, unless with the consent of the president of the district concerned, forfeit their membership, as do also members becoming three months in arrears for dues and assessments, unless officially exonerated from payment of same, but may be reinstated on certain terms. The local dues must not be less than 50 cents per month, one-half of which goes to the international organization, with such additional assessments as may be levied in accordance with the constitution. Boys under sixteen years of age, and decrepit or disabled members are required to pay only half of the tax or assessment levied. Local branches may be exonerated from the payment of dues and assessments under certain conditions, provided the members have been idle for one month, and the request for exonerated must be renewed from month to month. Local branches are prohibited from granting aid to strikes unless such strikes have been endorsed by the American Federation of Labor or an affiliated body. Other laws for the governance of local branches and their officers are also included in the constitution, among which is a provision that check weighmen must be members of the

U. M. W. for at least six months previous to election, except in the case of newly-organized branches.

The organization has in operation a transfer card system whereby members may transfer from one locality to another and still maintain a continuous membership with the union. Transfer cards issued by the Western Federation of Miners, the International Mining Congress and miners' unions of Australia and New Zealand are accepted by the organization, subject to the same provisions governing the acceptance of U. M. W. cards. Transfer cards of the Provincial Workmen's Association, however, are not accepted.

Regulations as to Strikes.—On the subject of strikes, the constitution provides that no district shall be permitted to engage in a strike involving all or a major portion of its members without the sanction of an international convention or the International Executive Board. District unions may order local strikes within their respective districts, on their own responsibility, but where such strikes are to be financed by the international union, they must be sanctioned by the International Executive Board. Strikes may be called in unorganized coal fields, provided the sanction of an international convention or of the International Executive Board has been granted, but unless otherwise decided by the International Executive, no financial aid is to be furnished by the international union for the support of any strike until after the strike has been in effect four weeks. This same board also shall decide the conditions upon which strikes may be financed by the international union, and determine the amount of relief to be paid to each member involved, etc. When strikes are sanctioned and financed by the international union the international president may appoint, subject to the approval of the International Executive Board, a financial agent who shall assume responsibility for all international funds so expended, said agent to be bonded to an amount to be determined by the International Executive Board, and no bills are to be paid by the international union unless contracted or authorized by said agent, the resident international officers or the International Executive Board. The accounts of the financial agent may be audited every quarter, or more frequently if considered necessary. When strikes are financed by the international union, each local branch involved in such strikes is required to furnish weekly details of all expenditures, under penalty of being debarred from financial relief from the international union.

Early Difficulties.—For several years after its establishment in 1890 the United Mine Workers Union gradually extended its influence and enrolled a considerable membership in both the anthracite and bituminous coal fields of the United States. In 1894, after a general strike, only partially successful, the membership of the union rapidly declined, until in the spring of 1897 there were less than 9,000 members, with practically nothing of the union left in the anthracite field. About this time the bituminous miners called a general strike, which, after a stubborn contest, resulted in a compromise settlement. The result of this agreement, though only giving the miners a slight advance, apparently gave an impetus to the organization, and the membership rapidly increased in the bituminous coal districts. On April 1, 1898, the U. M. W. A. secured, by agreement, the eight-hour day in the central competitive coal field, and later established the principle in all its well-organized sections. Not much progress was being made in these days in the anthra-

cite regions, and U. M. W. A. organizers, early in 1900, renewed their efforts to awaken interest on behalf of the organization, with, however, only a limited degree of success. Owing to failure to secure certain concessions from the operators, a strike of the anthracite miners was called on September 17, 1900, and although the membership of the union at this time was less than 8,000, between 80,000 and 100,000 took part in the strike on the first day. This number was gradually augmented during the next two weeks until there were nearly 144,000 employees idle. Work was resumed on October 29, the strikers having secured a number of concessions, including a 10 per cent. increase; recognition of the organization, however, was not granted. A little later, nearly every man and boy employed in the anthracite coal districts became a member of the United Mine Workers of America.

The Anthracite Coal Strike of 1902.—On May 15, 1902, again a strike was declared by a convention of delegates called to consider the matter. The dispute, which was believed to be on a larger scale than any previous strike in the United States, involved the anthracite districts, and included 150,000 employees, union and non-union.

The occasion of the strike was the demand of the United Mine Workers for an increase in wages, a decrease in working hours, and payment for coal by weight wherever practicable, and where then paid by the car. The union also demanded recognition. Much disorder and lawlessness, including three fatalities, occurred during the strike. The houses of men who remained at work were dynamited in several cases, and the lives of women and children were jeopardized. Officers of the Mine Workers publicly condemned violence and exhorted their followers to maintain law and order. The services of the state militia were, however, necessary to preserve the peace. Meanwhile, efforts at settlement were made by many public-spirited men. The union offered to submit the matters in dispute to arbitration, but the operators refused.

All attempts to bring the contending parties together having proved futile, United States President Roosevelt, on October 3, 1902, invited the various railroad presidents, the president of the anthracite district unions, and Mr. John Mitchell, the president of the U. M. W., to meet him. President Roosevelt appealed to the meeting to sink personal considerations and to make individual sacrifices for the common good. The president of the U. M. W. proposed that all the matters in dispute be submitted to the arbitration of a tribunal to be selected by the President. This proposition did not meet with the approval of the operators, who denounced the union, and urged the President to station federal troops in the anthracite coal fields. A few days after this conference, the entire National Guard of Pennsylvania was ordered to the coal fields by the Governor of the state. The operators had stated that with military protection they would be able to supply sufficient coal to meet the necessities of the public, but the presence of the troops had no appreciable effect upon the output. On October 13, 1902, a representative of the operators called on President Roosevelt and offered to submit the dispute to a commission of five men to be appointed by the President. Objection was raised by the Mine Workers' president to a stipulation that the arbitrators should be selected from certain classes of society, and he urged that the United States President should be given full power to select the members of the com-

mission. This was finally agreed to, and on October 23 work was resumed. The strike had lasted five months and a half. During the sixteen last weeks of the strike the sum of \$2,645,000 was collected and disbursed in aid of the strikers and their families.

The award of the Anthracite Coal Strike Commission was rendered on March 18, 1903. The employees did not get all their demands, but secured substantial increases in wages and material improvement in working conditions, also recognition of their organization. An important feature of the award was the provision for a board of conciliation to which disagreements under the award were to be referred for adjudication. The award was to continue in effect until April 1, 1906.

Suspension of Work in Anthracite and Bituminous Fields.—Although the agreement indicated above had still, in July, 1905, many months to run, yet negotiations were then opened with the coal operators with the view of making a new agreement on the termination of the award of 1903. The miners demanded an increase of 12½ per cent. over the then existing scale, as well as other concessions, including check-off and eight-hour day, the contract to continue for one year from April 1, 1906. The operators refused the demands and offered to renew the working agreement drafted by the Anthracite Coal Strike Commission of 1903. On April 1, no agreements having been reached, the bituminous miners to the number of 384,000 went on strike, while 150,000 in the anthracite coal fields suspended operations, not admitting that they were actually on strike. Many non-union miners were included among those who ceased work. Conferences followed between miners' officials and operators included in the joint interstate convention representing the central competitive and the southwestern competitive coal fields. The demands of the miners were finally modified, and it was proposed to accept a scale on the basis of the rates paid in 1903, plus an advance of 3 cents a ton in the southwestern states. Concurrently with negotiations in the bituminous fields, conferences and correspondence were being conducted with the anthracite operators. Being unable to secure the 12½ per cent. increase in the anthracite mines, the miners asked for a restoration of the 5½ cent reduction which was agreed to in 1904 owing to depression in trade. This was also refused. On May 18, 1906, the miners' convention decided to renew for three years the award of the Anthracite Coal Strike Commission, and, save here and there, work was soon afterwards resumed in both anthracite and bituminous regions.

In 1906 the interstate joint convention, composed of miners and operators, which had been in operation for a number of years as a means of deciding wage scales, was dissolved, owing to the failure of the board to arrange a satisfactory wage scale upon the termination of the contracts which had expired in that year.

In 1908, at the Indianapolis convention, Mr. John Mitchell, who had been president for nine years of the United Mine Workers Association, retired from that position, and was succeeded by Mr. T. L. Lewis, who had been for some time vice-president.

Compromise in Bituminous Field.—On March 31, 1908, a number of contracts expired in the central competitive bituminous field. The Scale Committee of the United Mine Workers prepared a report which was submitted to a special convention of the miners, and was adopted. No renewed working agreement was secured before the expiry of the existing contract,

and on April 1, 200,000 men ceased work. On May 1, work was resumed under an agreement reached on April 17 between the operators and the men. The contract was to continue in force for two years, and provided for a wage of 90 cents a ton, an eight-hour day and the reference of disputes to districts for settlement.

Agreement in the Anthracite Regions.—Previous to the expiry of the anthracite miners' agreement in 1909, conferences were held by the miners of districts Nos. 1, 7 and 9 and the operators. As a result, an agreement was reached, the same to become effective April 1, 1909, and to continue for three years—until March 31, 1912. The contract specified: (1) that the rates to be paid for new work should not be less than the rates paid under the award of the Anthracite Coal Strike Commission of 1903 for old work of a similar kind; (2) that the decision of the Conciliation Board permitting the collection of dues on company property and the posting of union notices should be continued; (3) that an employee discharged for being a member of a union should have a right to appeal to the Conciliation Board for final adjustment; (4) that disputes arising at a colliery working under the agreement should be first taken up with the foreman and superintendent in charge, and in case of failure to settle, should be referred to the Conciliation Board; (5) that the employers should issue pay statements showing the names of employees, amount of wages and class of work performed.

Compromise in the Bituminous Districts.—On expiry, on March 31, 1910, of the agreements in the bituminous districts covered by the interstate joint convention, the miners and operators were unable to agree on renewal contracts. The miners asked an increase of 10 cents a ton, as well as the betterment of working conditions, the contract to run for two years. The terms were not acceptable to the operators, who made counter proposals which were not considered favorable by the miners. A suspension of operations on April 1, 1910, occurred in the districts concerned, involving 300,000 men. Agreements, however, were soon negotiated, and operations were resumed.

New Agreements in the Bituminous and Anthracite Regions.—On March 31, 1912, the agreements in the bituminous and anthracite regions covered by the interstate joint convention expired. New agreements had been reached with the bituminous operators. These contracts, which were to continue in force for two years (until March 31, 1914), provided for varying increases in the wage scale in the different districts of the bituminous fields, as well as other concessions to the miners.

In the anthracite fields, however, no new working agreement had been reached, and there was a suspension of work by approximately 175,000 employees. Conferences followed, the negotiations lasting for about twenty days, when an agreement was finally reached. The new contract, which was to be effective until March 31, 1916, provided: (1) for a 10 per cent. advance in wages; (2) publishing of colliery rates; (3) recognition of mine committees; (4) proper election of check weighmen, and other substantial forms, including practically recognition of the union.

Strike in Colorado.—On April 1, 1910, a strike began in the coal fields of northern Colorado. The dispute arose over a demand for an advance in wages on expiry of the previous contract. On March 5, 1912, nearly two years from the commencement of the

strike, one company operating eight mines with 3,000 employees effected a settlement by granting an increase of 3 cents a ton on run-of-mine coal and 5 per cent. on day work. The strike at the other mines in the district continued, with no apparent prospect of settlement. In January, 1913, a committee of the Lower House of the Colorado State Legislature investigated the strike situation. In its report to the Legislature the committee stated that the strike was justified, and that the demands of the strikers were reasonable. The committee also reported that its efforts to effect a settlement of the dispute had been assisted by the union officials, but that the operators had blocked all attempts in that direction.

The U. M. W. proceeded meantime with the work of organizing the miners throughout the state, and on September 23, 1913, a strike affecting 11,000 employees was called at the mines in southern Colorado. The demands of the miners included recognition of the union, 10 per cent. advance in wages, and other reforms in working conditions. A number of the smaller independent operators signed the agreement, and operations were resumed. In the districts where the strike continued, rioting occurred at intervals, and in some instances continued for several days, many miners and mine guards being killed and injured. State troops were sent to quell the disturbance, and strikers were arrested for picketing and also on charges arising out of the strike. The miners and their families took shelter in tents which had been provided by the union. On October 21, 1913, a Congressional investigation was commenced. On November 22, a proposition by Governor Ammons for a joint conference of operators and their striking employees was accepted by both parties, but the conference failed to bring about a settlement. Governor Ammons and the Federal Secretary of Labor, Mr. Wilson, urged that the matters in dispute be referred to arbitration, but the suggestion was refused by the operators, and later the U. M. W. officials were indicted for conspiracy in restraint of interstate commerce. On December 18 the Colorado Federation of Labor passed resolutions demanding the release of imprisoned miners, the withdrawal of the militia, and the recall of the Governor for what was claimed to be a failure to do his duty. On March 15, 1914, the tents of the strikers were torn down and more strikers were imprisoned. The strikers appealed to the President of the United States and to the Secretary of Labor and a number of congressmen for Federal intervention. On April 14 the state militia were withdrawn, and on April 28 federal troops were ordered to the strike district. With the coming of the federal troops peace was restored, the strikers and mine guards being disarmed by order of the Secretary of War. The President was later urged to compel the mine owners to accept mediation of the strike. In addition to a federal investigation, it was stated that no less than thirty committees had investigated the strike, but none of these had been able to bring about any settlement. The miners, however, secured contracts with some of the independent operators.

In August, 1914, an order was issued by the Secretary of War prohibiting the importation of strike-breakers who were not citizens of the state of Colorado. On September 8 the President of the United States proposed terms of peace, or rather, as it was termed, a truce, to continue for three years. The proposition was based on the report of the conciliators

appointed by the Secretary of Labor, and provided: (1) enforcement of the mining and labor laws of the state; (2) re-employment of strikers who had not been guilty of violations of the law; (3) prohibited the intimidation of union or non-union men; (4) current scale of wages, rules, etc., for each mine to be posted; (5) grievance committee for each mine to be selected by majority ballot of employees (except officials of company). It was further suggested that grievances be first taken up individually with the proper officer of the company; failing adjustment, the grievance to be referred to a local grievance committee. Still failing adjustment, the matter in dispute was to be submitted to a commission composed of three men to be appointed by the President of the United States, representative of each side, with the third member as an umpire. Other conditions covering the proposed terms of settlement were the waiving of the claim for contractual relations; prohibition of employment of mine guards; withdrawal of troops; no picketing, parading or mass campaigning of miners; no suspension of work during consideration of grievances. All decisions of the commission were to be final. The expense of the commission was to be borne equally by the parties in interest. The miners called a special convention of the district to consider the proposal, and on September 15 the proposition was accepted. The operators, however, refused to accept the peace proposition, unless certain modifications were made.

At the thirty-fourth annual convention of the American Federation of Labor, held in Philadelphia, Pa., in November, 1914, a resolution was adopted calling on the President of the United States to insist that the coal operators immediately comply with the federal plan of settlement, and in the event of refusal that the President take the necessary steps to have a receiver appointed for the purpose of taking over the mines and operating them in the interest of the people under federal supervision. In the month of December, 1914, the Colorado situation was under consideration by the Federal Commission on Industrial Relations. On December 10, 1914, the representative of the miners, by a unanimous vote, called off the strike, depending, as it was stated, on the promise of the President that the commission appointed by him would compel the enforcement of the laws of the state, the abrogation of which by the operators, it was alleged, was the immediate cause of the strike.

Membership.—The story told in the foregoing pages by a recital of the strikes of the organization is a long and sad one, in many respects a tragic one. It is under such circumstances that the union has made its way from a membership of less than ten thousand in 1897 to over three hundred thousand in 1914. Whether for good or ill, the organization has made itself a power to be reckoned with.

In addition to the paid-up membership there are many members who, for various reasons, have not paid, some from inability. These are known as exonerated members. Including paid-up and exonerated members, the complete membership of the organization is much larger, standing, at the close of 1912, at 386,965, and in 1913, at 415,142. There are in all 2,574 local branches and twenty-six district unions.

During the past fourteen years no less a sum than \$12,175,607.76 has been expended by the union in strike benefits.

Advent into Canada.—According to records available, it appears that the first local branch of the U.

M. W. organized in Canada was No. 2314, which was formed in Fernie, B.C., on May 15, 1902. This local union was originally organized in April, 1899, as Gladstone Miners' Union of the Western Federation of Miners, but changed its affiliation and became identified with U. M. W. on the first mentioned date. Michel local of the federation also changed its affiliation and became a local branch of the U. M. W. in June, 1903. On November 9, 1903, District Union No. 18 was formed, the jurisdiction including the coal fields of the mainland of British Columbia and the province of Alberta. The first local branch organized in the latter province was No. 431, which was formed in Bellevue on December 13, 1903. Other local branches were formed in the district from time to time, the number at the close of the year 1914 being twenty-one.

For a number of years the operations of the U. M. W. in Canada were confined to the territory included in the jurisdiction of District No. 18, but in December, 1908, extended its activities into Nova Scotia, local branch No. 469 being established in Springhill. In the following year a large number of branches were formed in the Cape Breton coal fields, four of which are still in existence. District Union No. 26, with jurisdiction covering the province of Nova Scotia, was also instituted early in 1909. The district at the close of the present year was composed of six branches.

During 1911 several local branches were formed in the coal fields of Vancouver island in the province of British Columbia, and in December, 1911, District Union No. 28 was established with jurisdiction over the territory named. The branches connected with this district at present number six.

U. M. W. Strikes in Canada.—The first strike in the coal mining industry of Canada under the auspices of the United Mine Workers of America was that beginning on March 9, 1906, at Lethbridge, Alta., involving 500 men in the employ of the Alberta Railway and Irrigation Company. The demands of the strikers embraced: (1) recognition of the union; (2) check-off system, by which the dues, assessments, etc., payable to the union were to be deducted by the company from the employees' wages; (3) a minimum rate of pay to miners of \$3 per shift; (4) an eight-hour day for underground day work; (5) a material increase in the wages for underground and outside day labor; (6) rate of \$5 per-day for miners taken from contract to do company work; (7) coal mined by contract to be weighed before being screened; (8) the hearing of grievances by the company's officials and a pit committee, and other minor demands. The strike continued for many months, and in November the Deputy Minister of Labor visited the locality in the capacity of a conciliator. The parties to the dispute were brought together, and a compromise settlement effected by which most of the men secured an increase of 10 per cent. and a number of other concessions. The strike was declared off on December 3, 1906. The company did not give recognition to the union, but promised that members of the union should not be discriminated against.

On April 1, 1907, the agreement between the several companies comprising the Western Coal Operators' Association terminated. A conference held at Calgary for the purpose of effecting a new contract proved ineffective, and the employees, numbering 3,450, of the companies concerned, suspended work. Some days later applications were made by both parties to the dispute for a board of conciliation and in-

vestigation under the provisions of the Industrial Disputes Investigation Act, which had become law only on March 22, 1907, and a board was constituted. The operators and the miners carried on direct negotiations, looking to an adjustment of the matters in dispute, the board assisting, and on May 2 a settlement proposition was submitted to a referendum vote of the miners. The agreement, which was to continue for two years, was accepted, and on May 7 work in the mines was resumed. The agreement as adopted granted varying increases in wages, and provided for a permanent board composed of representatives of both parties, before which disputes may be brought for final settlement.

On the expiration of the above agreement on March 31, 1909, the preliminary conference between the Western Coal Operators' Association and the officials of the U. M. W. having again proved ineffective, a strike of 2,500 employees occurred on April 28, 1909. One large company which had been in 1907 in the Western Coal Operators' Association had made a separate agreement, and was for the time outside the association. The differences existing were later referred to a board of conciliation and investigation under the Industrial Disputes Investigation Act, and a settlement was ultimately effected on June 30, based on the old agreement, to be effective till March 31, 1911.

On June 23, 1909, the officers of District Union No. 26 sent communications to the coal operators in Nova Scotia requesting them to attend a joint conference in Sydney on July 2. This communication, and a later one to the same effect, appear to have been ignored by the operators. In April a board of conciliation and investigation was, on demand of the employees (represented by the U. M. W. A.) of the Dominion Coal Company at Glace Bay, appointed under the provisions of the Industrial Disputes Investigation Act to investigate various grievances, chiefly an alleged discrimination against workmen because of their membership in the U. M. W. The board found that there had been no improper discrimination. The union had also demanded union recognition. The board failed to secure any working agreement, and on July 6 a strike of 2,500 men, members of the U. M. W., was declared at Glace Bay, arising mainly, as it appeared, from the refusal of the Dominion Coal Company to recognize the union. In this dispute the U. M. W. came into conflict with the Provincial Workmen's Association, an organization of miners which had operated in the coal fields of Nova Scotia for many years previous to the entry of the U. M. W. into the district, and with which body the company had entered into an agreement terminating December 31, 1909. Members of the Provincial Workmen's Association remained at work. On July 7 some disturbances occurred as the non-strikers proceeded to work, and troops were sent into the locality to preserve order. Some miners and their families were evicted from the company's houses, and some union members were arrested on charges arising out of riots which occurred. The strike was declared off on April 28, 1910. The union does not appear to have secured any concessions.

On July 9, 1909, the members of the local lodge of the U. M. W. at Inverness went on strike for recognition of the union, and demanded non-recognition of the Provincial Workmen's Association by the mining company who had an existing agreement with the latter organization. This strike occurred without having the dispute go before a board. Some disturbances having

occurred the day after the strike, the officials of the coal company asked for military protection, and a number of troops were sent to the locality. The strike continued for some months, but became gradually ineffective and was apparently never declared off formally.

On August 9, 1909, a strike of 1,700 miners occurred at Springhill. The demands of the men included the recognition of the U. M. W. and better conditions relating to employment. Before the strike was ordered the demands of the men were considered by a board of conciliation and investigation under the Industrial Disputes Investigation Act. The findings of the board were not acceptable to the union, and the strike resulted. The strike was declared off on May 27, 1911, without, as it appeared at the time, any special concession to the union.

Reports of the U. M. W. A. showed that the organization spent during the year 1910 the sum of \$968,775 in strike benefits in District No. 26, comprising the coal fields of Nova Scotia.

Turning again to Western Canada, we find that on April 1, 1911, owing to the failure once more of the conference between the Western Coal Operators and the officers of District 18 of the U. M. W. A., the employees, numbering 6,000 of sixteen coal companies ceased work. The question of making a new agreement was subsequently referred to a board of conciliation and investigation under the Industrial Investigation Act. The award of the board was not, however, accepted, and the strike continued. A basis of settlement was finally reached, providing for a 10 per cent. increase in wages, and for a number of changes in conditions of employment. The new contract was to continue in force until March 31, 1915. Work was resumed on November 20, 1911.

On September 16, 1912, miners at the Canadian Collieries at Cumberland, Vancouver Island, among whom a local of the U. M. W. had sprung up, ceased work as a protest against an alleged discrimination by the company against two of their number. Two days later the mine workers employed by the same company at Extension mines, near Nanaimo, B.C., also quit work. The strike continued until May 1, 1913, though becoming somewhat ineffective. On May 1, 1913, a strike was declared at all the coal mines on Vancouver Island, and approximately 3,000 men ceased work. The mines at Cumberland were perhaps the least affected by the new strike. The demands of the miners included an advance in wages and recognition of the union. During August, 1913, some rioting occurred in the strike district, and the militia were sent to keep order. Many strikers were arrested and convicted for complicity in the disturbances. The strike was the subject of a special investigation under a Royal Commission of the Dominion Government. The Minister of Labor and the Deputy Minister were also at different times on the ground, but no settlement could be secured. The strike benefits are said to have been at the highest rate ever paid by the union, \$16,500 being distributed weekly for many months. During the year 1913 the benefits disbursed amounted to \$584,500; for the first six months of 1914, \$432,000, making in all over \$1,000,000. The strike was declared off on Aug. 19, 1914, it was not clear on what basis, but the outbreak of the great European war no doubt had an intimate bearing on the situation.

The foregoing does not include all of the disputes with which the Canadian membership has been involved.

There were a number of minor controversies, some of which were settled without much difficulty. In some important disputes the issues were referred to boards of conciliation and investigation formed under the provisions of the Industrial Disputes Investigation Act, the union securing sometimes material concessions.

(To be Continued.)

GOLD IN NOVA SCOTIA

By J. A. MacDonald.

The gold in Nova Scotia occurs chiefly in quartz veins, some of which cross the strike of the formation, but most of which are interstratified with the rocks and lie chiefly in slate beds found in the quartzite formation. The veins are found on the domes and at the plunging of the anticlines, and the outcrops form a series of concentric ellipses or portions of ellipses. While most of the veins are interstratified they are often seen to cross the slate bed and pass from the foot wall of quartz to the hanging wall. Veins are frequently corrugated. The gold occurs in shoots which pitch at a low angle to the east or west. Most of the gold is free milling. The richest portions of the veins seem to lie in those parts of the domes where there is some irregularity in the rock structure. It is evident that the deposition of the ore is dependent on the rock structure.

Gold has been mined in about fifty different centres in Nova Scotia, but systematic prospecting, assisted by the work of the geological surveys, may yet reveal the presence of other paying centres.

Laying out mining claims in Nova Scotia.—All gold or silver properties in Nova Scotia are to be laid out in areas of two hundred and fifty feet in length, magnetic, meridian, north and south, and one hundred and fifty feet, east and west. Areas are required by the regulations to be laid out as far as possible uniformly, and in rectangular shapes. Surface measurements of areas must be horizontal, and each area must be bounded by vertical planes passing through the horizontal surface lines.

Every person who stakes off land in Nova Scotia not less in extent than six areas, upon which he has discovered gold or silver, is entitled to a license or lease of the areas included within such land, provided he has made application for a license or lease of the same within one week after staking off, and 24 hours' additional time for every 15 miles distant from the office of the deputy commissioner. A prospecting license shall be in force for 12 months from the date of application therefor. Surveys of land comprising the areas held under lease may be ordered by the Commissioner.

There is also provision for the issuing of what is known as an Alluvial License, good for three months only, between March 31st and December 1st only, of any one year. An alluvial license means a license to search for gold-bearing earth or rock elsewhere than *in situ*. The holder of an alluvial license is empowered to prospect over a territory comprising five hundred (500) acres, which territory may be greater in length than twice the width; but shall not be less than 750 feet in width.

Before a prospecting or alluvial license is issued the applicant must enter into a bond to compensate the owner of the land, in the event of private land, and also pay the royalties, which for gold and silver is two per centum of the gross value thereof.

ZINC LOSS IN PRECIPITATION

The paper read by Mr. Dorfman, superintendent of the McIntyre mill, before the Porcupine branch of the Canadian Mining Institute aroused much discussion and was of importance to all millmen. It was specially prepared for the Northern Miner by Mr. Dorfman.

Mr. Dorfman writes: A certain amount of trouble in cyanide mills arises in the precipitation system. Very little attention compared with the other branches of cyanidation is paid to this phase of the question. While we find elaborate descriptions in technical literature of almost all existing gold mills we do not get any details of the precipitation question. We all know and all have had unfortunate experiences when the precipitates were being dissolved from the press, of something that seems against chemical laws. In such a case the mill man usually blames the canvas for leakage, the sampler for accuracy, or the assayer for incorrect assay. His usual remedies are the addition of lead acetate, higher cyanide and alkiline contents or vice versa, till finally things get somewhat straightened out and he is only too glad to forget his troubles and does not care to go back and find out the real causes of such abnormal facts.

The problem of precipitation must be definitely solved in its details and studied. Systematic work will have to be done. First of all what becomes of the zinc going to the presses or going out from the presses and also what are precipitates?

The following experiment was carried out at the McIntyre mill for seven days, all the mill solutions were carefully sampled for this period, and the zinc and precipitates were carefully weighed. American zinc dust was used, which contains 95.04 per cent. total zinc. The amount of zinc used up for the week was 984 lb., yielding 935.19 lb. of zinc. In cleaning out the precipitation press the dried precipitate was found to weigh 735 lb. The zinc content of the precipitate was 3.25 per cent., giving 239.38 lb. of zinc left in the presses, consequently 695.81 lb. of zinc was dissolved from the presses. In other words 74.4 per cent. of the total zinc is wasted by secondary reactions.

The first impression, at least the visual impression, is always that there is almost as much zinc in the presses as there was put in. The results of the experiment appear to be rather amazing. But the solution assays give the following results: the pregnant solution analyzed 0.108 lb. of zinc per ton, while the barren solution showed 0.308 lb. per ton, or an increase of 0.15 lb. for each ton of solution. As 4,703 tons of solution was precipitated, the amount of zinc from the presses would be 705 lb., or 75.4 per cent. of the total zinc in solution was wasted in secondary reaction.

For seven days the clean-up gave 832.31 oz. of fine gold and 17.39 lb. of silver. The theoretical amount of zinc to precipitate the total silver would be 6.178 lb. In practice the amount of zinc used to keep up precipitation was almost 1,000 lb.

How do the solutions get rid of the zinc?

All the mill solutions were analyzed and showed the following zinc contents:

	Zinc per ton of Solution
Hardinge mill discharge	0.157
Storage	0.213
Classifier overflow solution	0.165

Agitator solutions	0.147
Pregnant solutions	0.158
Barren solutions	0.308
Tail solutions	0.125

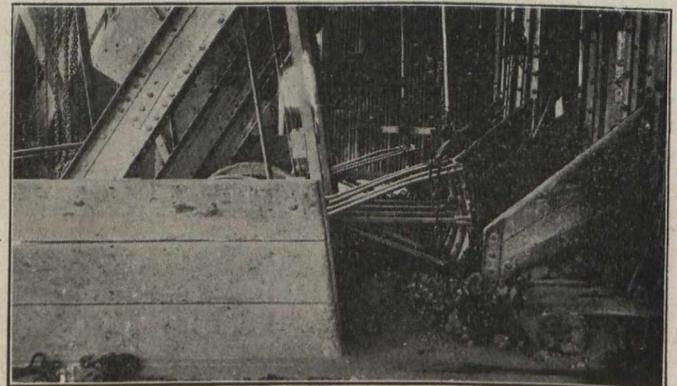
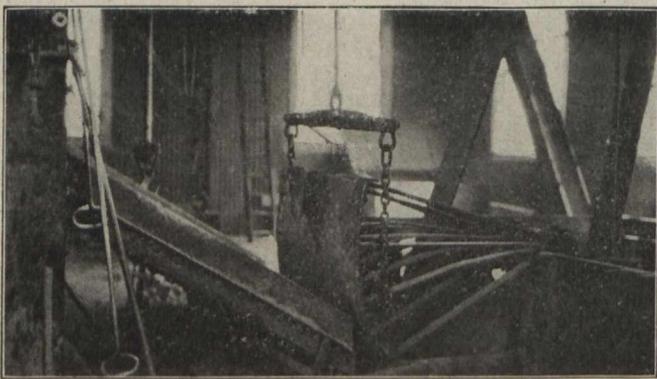
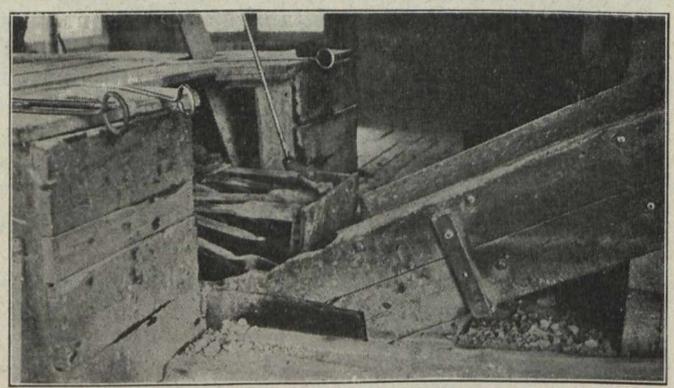
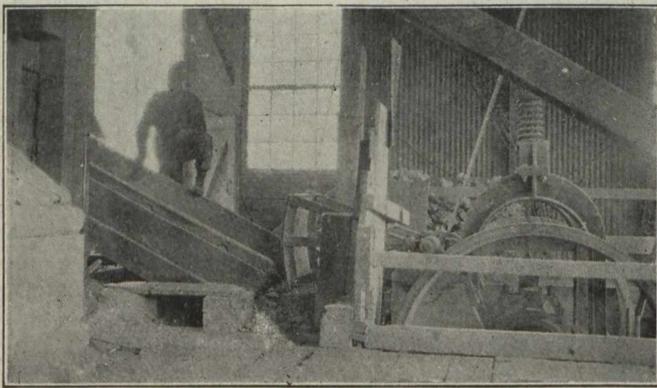
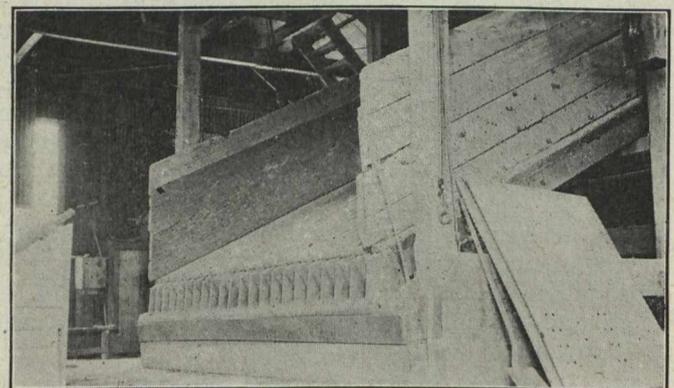
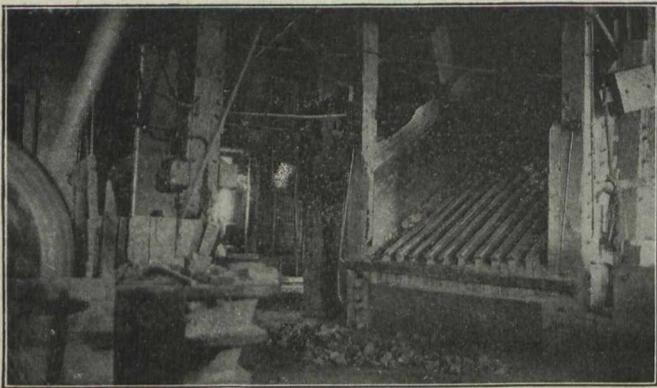
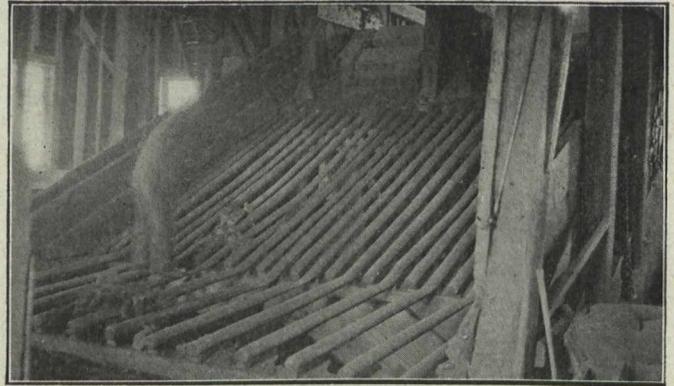
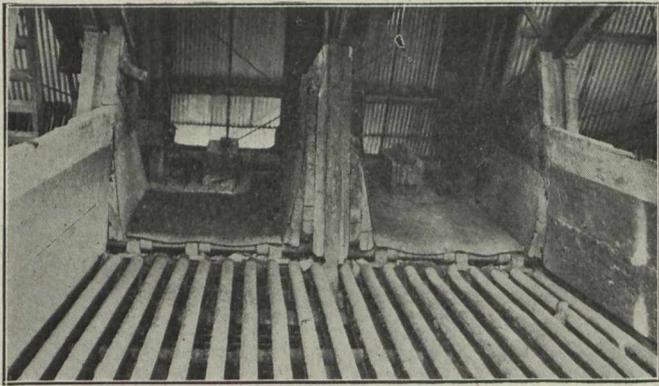
The report of the experiment showed the amount of zinc precipitated out from the solutions at each stage.

	Zinc Precipitated	Percentage of Zinc used in press
Hardinge mill	150.96	16.14
Tube mill circuits	179.96	19.24
Agitators.	90.23	9.65
Decantation system ...	281.93	30.15

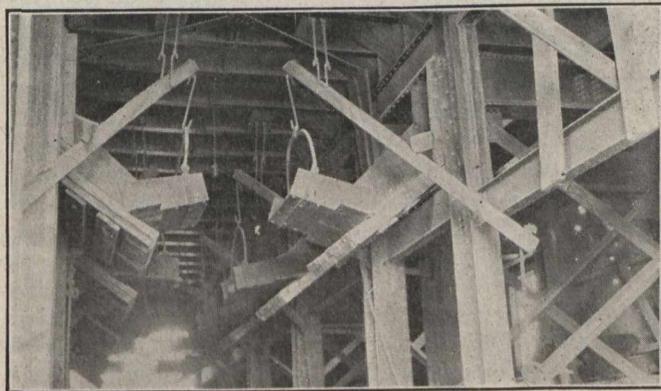
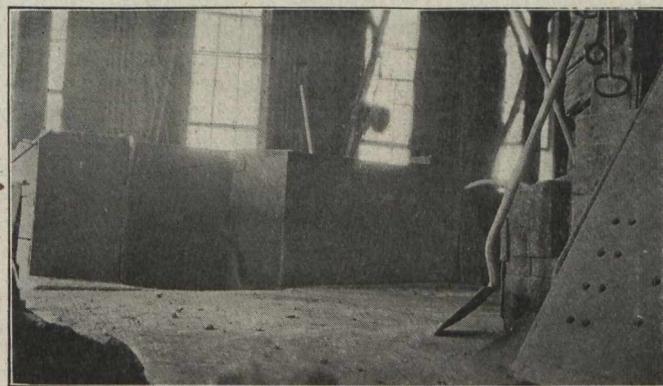
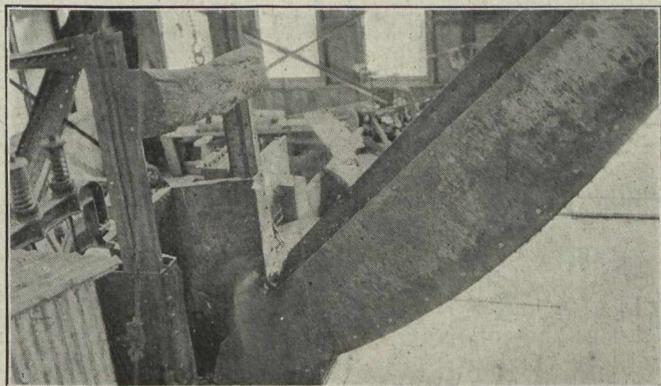
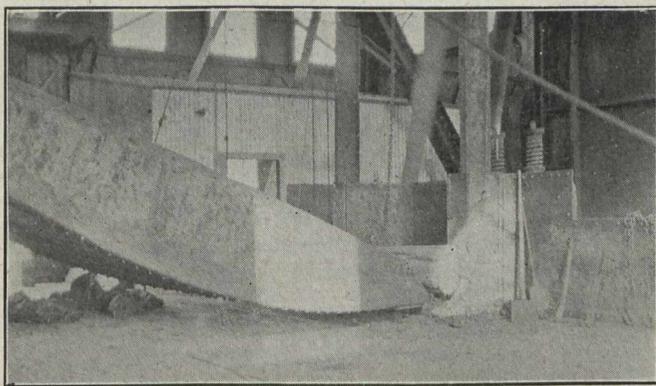
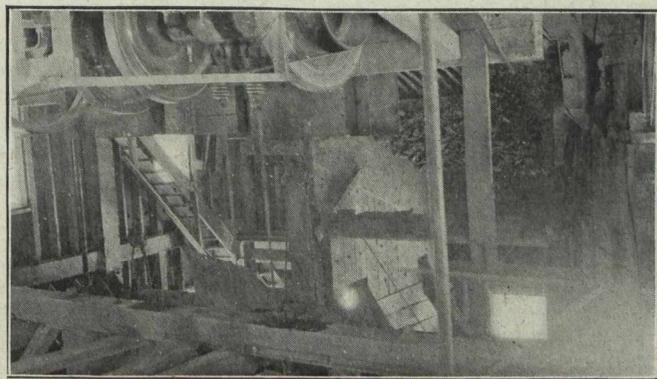
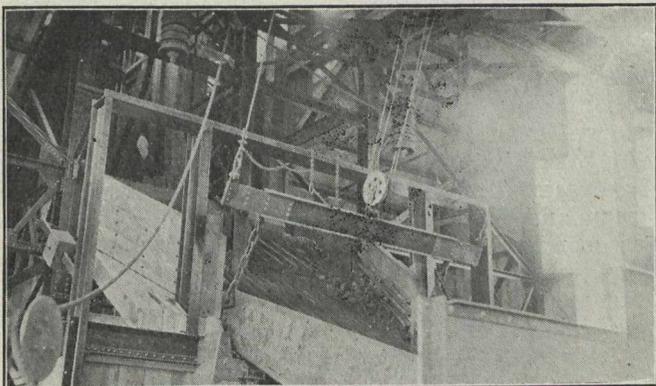
It will be seen that if we add the amount of zinc precipitated in each of these stages we get a total waste of 705.08 lb. or 75.18 per cent. of zinc.



A gold quartz vein, Dome mine, Porcupine



Some Rock-house suggestions from the Michigan Copper Country



Some Rock-house suggestions from the Michigan Copper Country

TOUGH-OAKES GOLD MINES

In the Companies (Winding-up) and Chancery Division on July 15 Mr. Justice Neville had before him the petition of Mr. G. F. S. Bowles, of Connaught square W., for the compulsory winding up of Tough-Oakes Gold Mines, Ltd. Mr. Peterson, K.C., and Mr. Manning were for petitioner; Mr. Clauson, K.C., and Mr. Macaskie for respondent company.

Mr. Peterson, K.C., said this was a petition by a shareholder to wind up Tough-Oakes Gold Mines, Ltd., and the question in substance before the Court was whether or not the substratum of the company had disappeared. There were two Tough-Oakes Gold Mines Companies, one a Canadian, and the other an English Company. The Court had now to deal with the English company, which was formed to acquire from the Kirkland Lake Proprietary, Ltd., a controlling interest in the Tough-Oakes Gold Mines, Ltd., of Haileybury, Ontario. The English company had an authorized capital of £500,000, in £1 shares, of which 230,007 were allotted and called up, including 30,000 shares issued as fully paid. The three directors were: Mr. G. R. Bonnard, Mr. F. Johnson and Mr. R. Simpson. The English company issued a prospectus dated 9th March, 1914, offering 100,000 shares for subscription at par. The prospectus stated that the company had been formed to acquire from Kirkland Lake Proprietary, Ltd., of 4 and 6, Throgmorton avenue, E.C., the promoter of the company, (a) 426,388 fully-paid shares in the Tough-Oakes Gold Mines, Ltd., of Haileybury, Ontario, a Canadian company with a capital of \$3,000,000, divided into 600,000 shares of \$5 each, owning the Tough-Oakes Gold Mine, in the Kirkland Lake Goldfield, Ontario, and (b) options of purchasing in part or in whole a further 171,110 shares in the Canadian company. That, said counsel, was the basis of the company. The English Tough-Oakes Company had received £200,000 cash in respect of shares issued by it. The company had paid to the Kirkland Lake Company for the 66,781 shares which had been delivered to it £44,996 15s. 3d., which left a balance in its hands of £155,003 4s. 9d. There was a peculiar transaction by which the English company was to take up for £30,253 8s. shares in the Kirkland Lake Company. These were apparently bought from the Union and Rhodesian Trust, Ltd., which acted as secretary of both companies. This left a balance of £124,749 16s. 9d. Now, what happened to the rest of it? In the same building (Finsbury Payment House), and on the same floor, were a number of companies, in all of which Mr. H. G. Latilla had an interest, and the names of all these companies appeared on the door. Of the balance of £124,749 no less than £112,831 12s. 9d. was advanced by the English Tough-Oakes Gold Mines to the various companies and individuals in this building. This appeared to have been a regular in-and-out business, each company having shares in the other, and giving as security for loans shares in its company. After these loans had been made there was left £11,918 4s. These advances were made right up to well into August of last year, and the result was that it was quite impossible now to get this money back from these companies. The war had intervened and made matters on the Stock Exchange more difficult than before. The result was that this English company had not got the money necessary to carry out the agreement with the Canadian company, and the substratum of the company was therefore gone. The companies

and individuals interested in the loans were the Tough-Oakes Gold Mines, Ltd., Finsbury Payment House, formerly 4-6 Throgmorton avenue, the Union and Rhodesian Trust, Ltd., the Anglo-Transvaal Rhodesian Trust, Sudbury Syndicate, Ltd., Kirkland Lake Proprietary, H. G. Latilla, Secretariat, Ltd., and the Ptarmigan Mines, all the addresses being the same. The directors of the Tough-Oakes were Bonnard, Johnson and Simpson, and loans were made to the other companies. Latilla and Burt were directors of the Union and Rhodesian Trust, and there was a loan made to them of £60,612 3s. 7d., the security being 14,800 shares in Kirkland Lake Proprietary and 2,945 shares in Sudbury Syndicate. Burt and J. D. G. Simpson were directors of the Anglo-Transvaal Rhodesian Trust. The loan was £5,500 and the security 2,000 shares in Ptarmigan Mines and 8,000 shares in the Union and Rhodesian Trust. The director of the Sudbury Syndicate was Burt, the loan was £500, and the security 500 shares in Kirkland Lake Proprietary. In Kirkland Lake Proprietary Latilla, Burt and J. D. G. Simpson were the directors, the loan was £29,062, and there was no security. The share capital pledged was 18,013 shares, including 2,000 ex Bonnard, 1,500 R. Simpson and Bonnard, 820 R. Simpson, 1,475 R. and J. D. G. Simpson, 1,065 A. Burt, 225 H. Warwick, and 350 V. W. Comer. There was a loan to Latilla of £6,389, the security being 5,200 shares in the Union and Rhodesian Trust. The Secretariat, Ltd., had as directors F. Johnson and Latilla (formerly R. Simpson). The directors of Ptarmigan Mines were F. Johnson and Latilla, and the share capital pledged was 2,000 shares, all ex Latilla and Burt.

Mr. Clauson, K.C., said before the war the shares given as security for the loans were being dealt in on the Stock Exchange at figures which justified the loans. Of course, now all these figures had gone to pieces.

Mr. Owen Thompson said he represented holders of 155,000 shares opposing the petition.

Mr. Luxmore, for 20,542 shareholders, supported the petition.

Mr. Clauson said his clients, the company, had tried to get the Kirkland Lake Proprietary to carry out the contract. Mr. Foster was the man who was causing all the difficulties, and he (counsel) alleged that this was an action to prevent the company bringing its actions against Foster and Latilla.

Counsel said his point was very simple. If these holders of 20,000 shares wanted satisfaction their first step should have been to put the company into voluntary liquidation. There were three actions pending in the King's Bench Division, and it might be that when they were finished the substratum of the company would be gone, but they should wait until they had finished their actions.

Mr. Peterson said the question was really could this company carry out its contract? Where was its money? The whole of it was loaned to this congeries of companies, and even when they were sued they could not pay. How was this English company to pay for these shares in the Canadian company? The shareholders' position was that, owing to the malpractices on the part of the directors it was no longer possible to complete the contract. The company had not the money to carry out the contract.

His Lordship: Has Mr. Bonnard got any description except as "a director of companies?"

Mr. Peterson: I don't know of any.

His Lordship: Do you know anything of Johnson?

Mr. Peterson: His business was acquired by Secretariat, Ltd., Latilla being the other director. Counsel argued that most of the directors of the companies involved were members of the "nest" at Finsbury Pavement House.

Mr. Clauson said there were less than 24,000 shares involved in this petition, and he asked was it just and equitable that a winding-up order should be made when there were at least 155,000 shares against? The Court must have regard to the wishes of the contributors, and he had the large majority. There were actions pending in another branch of the Courts to compel the completion of the contract, and this petition should stand over pending the hearing of those actions.

His Lordship directed the petition to stand over pending the hearing of the actions in the King's Bench Division, the company undertaking to prosecute the actions in the King's Bench Division with due diligence and to use its best endeavors to get in any moneys owing to the company.—Financial Times, London.

PREVENTING AND LIMITING EXPLOSIONS IN COAL MINES.

The U. S. Bureau of Mines has just issued Technical Paper 84, "Methods of Preventing and Limiting Explosions in Coal Mines," by George S. Rice, chief mining engineer, and L. M. Jones, mining engineer.

Mr. Rice in the introduction says: "Although advance in the knowledge of mine explosions, particularly coal dust explosions, has been slow, yet since investigations were begun in 1908 by the testing stations of various countries, progress has been steady, each station contributing to the general fund of knowledge.

"During the fiscal year ended June 30, 1914, the U. S. Bureau of Mines had an especially fruitful period of investigation, available funds being sufficient to carry on an important series of large scale explosion tests at the experimental mine at Bruceston, Pa., in order to determine the relative explosibility of different mine dusts and the efficiency of various methods of preventing and of stopping explosions. The large scale testing for relative inflammability was supplemented by inflammability tests in the laboratory. In all, the explosion experiments were undoubtedly the most important and instructive of their kind ever conducted in this country.

"During the year the work was greatly stimulated by a month's visit of J. Taffanel, the distinguished director of the French testing station at Lievin, who collaborated with the bureau's representatives at the experimental mine in making standardizing tests that would permit the comparison of the more important results with those obtained in the French testing gallery, and also with the results of the small group of experiments made in the Commentry mine, France. The tests were designed more particularly to determine (1) whether the same percentages as ash and other inert matter in the dust mixtures for a similar class of coal would prevent ignition of the dust from a blown-out shot, and (2) whether a strong explosion of gas or dust would be propagated throughout a long adjacent zone containing such mixed dust.

"While Mr. Taffanel was present certain barrier devices that had proved effectual in the French gallery were tested to ascertain whether they would prove effectual under American mine conditions, and also to

compare their efficiency with barrier devices, devised by the bureau. Although the French devices proved effective, the bureau's seemed better suited to the usual American mine conditions.

"Much information was obtained from the tests conducted during the year in determining the velocity of propagation of explosions, the pressure obtained at certain stages with different mixtures, and the gases produced. At the time of preparing this publication the data are being compiled, but compilation and correlation of the large mass of data will take considerable time. Therefore, it has been considered expedient to publish promptly a brief report of such practical results as may be applied to the prevention and stopping of explosions. Especially it is hoped that the suggestions may lead operators of dusty bituminous mines to take additional safeguards during the winter and early spring, because it has been demonstrated that there is especial danger of coal dust explosions during and following cold weather, owing to the natural drying out of coal dust in the mines. Of course, it must be fully understood that precautions must not be neglected at any time in the year; the issuance of methane into the mines is not affected by seasonal changes, and in extensive mines, if watering of some sort is not practised, dry dust is frequently found in abundance in the interior of the mine, even in warm, humid weather. The final proof of a safe condition where watering or humidifying is employed is to have the dust wet in every part of the mine, and at all times of the year."

STEEL CO. OF CANADA.

The Steel Company of Canada is increasing its open hearth steel capacity to take care of the large war orders it has taken from England direct and from the Canadian Car & Foundry Co. The company has 14 plants making bolts, wire, etc., and is also turning out steel for shrapnel and shells. It is working at full capacity and turning out steel at the rate of 900,000 tons per year. At the present basis of steel prices the company should have the best year in its history in 1915.

MINES AND HUMANITY.

If war is becoming less humane, mining is becoming more and more humanitarian.

The late Dr. Holmes of the Bureau of Mines, Washington, rounded out a life devoted in later years to safer and more rational conditions for mine labor. The policy of this bureau has been to co-operate with state departments wherever the industry had acquired prominence. The result was rapid progress not only in safety but also in living conditions.

In the Connellsville coke regions a single company with 18,000 employees and their families, at 65 operating mines, has adopted every safety device possible, affords relief in case of temporary or permanent disability and compensates faithful employees who become incapacitated. Every mine has its fire-fighting organization and first-aid stations, and the company has 200 first-aid teams available. These employees pay no contribution and receive relief payments without legal proceedings. In a few years over half a million dollars has been spent in bettering condition of workmen in sanitary and other similar matters. More than 7,000 shade trees have been planted, and resident miners vie in competition for the best gardens and lawns. The sight of children playing on the 25 play grounds is a thing that may well cause the old heart to feel young again.—The Wall Street Journal.

PERSONAL AND GENERAL

Mr. H. L. Roscoe, of the British-American Nickel Company's staff, formerly instructor in metallurgy at the Michigan College of Mines, has joined the staff of the Quiney Mining Company, Hancock, Mich.

Mr. R. G. McConnell, Deputy Minister of Mines of Canada, is in Vancouver.

Mr. E. C. Pullen, superintendent of the Alexo nickel mine, is taking an officers' training course at Niagara camp.

Mr. J. Parke Channing is at Houghton, Mich.

Dr. F. W. McNair is on a trip to Denver, Salt Lake City, and San Francisco.

Dr. William Battle Phillips, director of the Bureau of Economic Geology and Technology of the University of Texas, has been appointed president of the Colorado School of Mines.

Mr. W. F. McNeil is arranging a mineral exhibit for the National Exposition at Toronto.

Mr. F. M. Connell is at Goodfish Lake.

Mr. Robert Flaherty is again en route to Hudson's Bay. This year he travels via Cochrane and the Moose river. His last year's trip was around the Labrador coast.

Mr. Charles Lawton, general manager of the Quiney Mining Company, has been visiting silver mines at Cobalt.

Mr. Albert Blair is at San Pedro, Coahuila, Mexico.

Mr. Raoul Madero is at Torreon, Mexico.

Mr. M. C. H. Little of Cobalt, is examining the St. Anthony gold mine, Sturgeon lake district, Ontario.

Mr. J. G. Sipprell is at Renfrew, Ont.

Dr. A. C. Lane is at Houghton, Mich.

Mr. D. A. Thomas has visited the Nova Scotia plants engaged in the manufacture of munitions.

Mr. Roy Reynolds has been appointed captain at Trimountain mine.

GERMANY'S COPPER.

The Boston News Bureau publishes the following comment on a recent German despatch:

If all the war reports emanating from Berlin are as accurate as that under Berlin date of July 31, from the Overseas News Agency and relating to Germany's supply of copper, some big discounts are in order. The report in question is to the effect that the German Government has begun a systematic gathering of figures and statistics concerning existing supplies of copper, it having "been known previously that in addition to the increase in copper production, the supplies surpassed 2,000,000 tons, sufficient to meet war requirements for ten years." Reduced to pounds we are asked to believe that Germany has reserve supplies of 4,480,000,000 lb. of copper, which amount is more than double her own production plus imports from the United States for the past ten years.

If one wants the figures covering the past ten years, here they are (in lb.): Germany's production, 450,000,000; Germany's imports from United States, 1,600,000,000. Here is a total of 2,050,000,000 lb. of copper, or less than half the stock now claimed. If the Berlin report were even 50 per cent. true it would mean that Germany had on hand to-day available for war purposes her total production and American imports for the past ten years—a story too absurd to warrant dignified denial.

THE REVELLE OF ROMANCE.

Regret no more the age of arms,
Nor sigh "Romance is dead."
Out of life's dull and dreary maze
Romance has raised her head.

Now at her golden clarion call
The sword salutes the sun;
The bayonet glitters from its sheath
To deck the deadly gun;

The tramp of horse is heard afar
And down the Autumn wind,
The shrapnel shrieks of sudden doom
To which brave eyes are blind.

From East and West and South and North
The hosts are crowding still;
The long rails hum as troop-trains come
By valley, plain and hill;

And whence came yearly argosies
Laden with silks and corn,
Vast fleets of countless armed men
O'er the broad seas are borne.

All come to that gay festival
Of rifle, lance and sword,
Where toasts are pledged in red heart's blood
And Death sits at the board.

Now Briton, Gaul and Slav and Serb
Clash with the Goth and Hun
Upon grim fields where whose yields
Romance, at least, has won.

Though warriors fall like frosted leaves
Before November winds,
They only lose what all must lose
But find what none else finds.

Their bodies lie beside the way.
In trench, by barricade,
Discarded by the titan Will
That shatters what is made.

Poor empty sheaths, they mark the course
Of spirits bold as young;
Whatever checked that fiery charge
As dust to dust was flung.

For terrible it is to slay
And bitter to be slain,
But joy it is to crown the soul
In its heroic reign.

And better far to make or mar,
Godlike, but for a day,
Than pace the sluggard's slavish round
In life-long, mean decay.

* * * * *

Who sighs, then, for the Golden Age?
Romance has raised her head,
And in the sad and sombre days
Walks proudly o'er your head.
—Lt. Peregrine Aeland,

48th Highlanders, 15th Batt.

SPECIAL CORRESPONDENCE

BRITISH COLUMBIA

While information relative to the part miners in British Columbia are taking in connection with further participation in the European war is far from complete, it is known that many of them are doing their full share. Numbers of men from various parts of the Kootenay and Boundary mining districts are among the soldiers in training in the camp near Vernon, Okanagan, preparing to follow others who volunteered for service early in the war and proceeded to England and thence to the battle front. At the present time coal miners on Vancouver Island are organizing themselves into companies for active service. The liberal response being made by miners in various parts of the province to appeals for funds for the purchase of machine guns is creditable and gratifying. Men in the employ of the Canadian Collieries (Dunsmuir), Limited, at Ladysmith and Extension, have undertaken to contribute \$1,000 for a gun; at Hedley, Similkameen, employees of the Hedley Gold Mining Co. at the Nickel Plate mine have contributed the money for one gun; others employed at the same company's gold mill have done similarly, while the townspeople and others resident near Hedley have promised still another. There are other instances of help being rendered in this way, but these are mentioned by way of illustration of the fact that the miners are contributing freely in both men and money to the Empire's present need. Still another instance occurs to mind—Mr. Wm. Fernie, in the early nineties of last century a pioneer in the development of the coal resources of the Crow's Nest Pass country, but now spending the evening of his earthly life in Victoria, lately gave \$1,000 for a machine gun for the use of Kootenay soldiers now in camp.

West Kootenay.

Ainsworth.—Concentrating ore from the Silver Hoard mine, near the town of Ainsworth, has been sent to the Consolidated Mining and Smelting Co.'s concentrating plant at Rossland for test purposes. Spokane men have done much development work on the Silver Hoard property and have opened a considerable quantity of ore that will require concentration, so they are endeavoring to ascertain what treatment process will be best for this ore.

Other Spokane men have opened the Florence mine, situated two or three miles from Ainsworth, and it is claimed there is much ore available for extraction whenever it shall be deemed advisable to make the mine a regular producer. Still other men resident in Spokane are making investigations concerning some mineral claims in the neighborhood of the Bluebell mine, across the lake from Ainsworth.

Slocan.—Among the mining news published recently by the Slocan Record, New Denver, are the following notes: It is stated that so far the Standard Silver-Lead Mining Co., which in July resumed shipment to Trail of silver-lead ore and concentrate from its mine and concentrating mill near Silverton, Slocan lake, has not been supplied with more than 12 railway cars a week by the Canadian Pacific Railway, notwithstanding that twice that number could easily be loaded and sent out. However, this matter will be righted

in a few weeks. The ore shoot opened lately in the Wakefield mine, above Four-mile creek, has been found to widen out to about 2 ft. Fifteen tons of ore have already been sacked; a carload shipment will shortly be made. (Note—This mine, formerly a profitable producer, had been idle for a number of years until last spring, when some local men arranged with the owners to work it.) A strong vein of high grade ore was opened last week on the Black Grouse mineral claim, situated about two and a half miles from Three Forks, on the North Fork of Carpenter creek; it was encountered in a crosscut adit 210 ft. from the portal and at a vertical depth below the surface of about 200 ft. The ore shoot is between 3 and 4 ft. in width.

On July 17, the Spokesman-Review, of Spokane, Washington, in which city reside several directors of the Rambler-Cariboo Mines, Ltd., published the following statement relative to the Rambler-Cariboo mine, which is situated a few miles from Three Forks. The increase in the price of spelter since the last consignment of twelve cars of zinc concentrate was forwarded to the smeltery at Bartlesville, Oklahoma, U.S.A., before expiry of its contract with the Rambler-Cariboo Company, has resulted in the settlements for that shipment running \$15,000 over the estimate, with two cars yet to be settled for, according to reports received yesterday by the company. Settlement was made yesterday for the last two of ten cars of the concentrate that had been treated, and the draft received was for \$8,256, or approximately \$103 a ton net. The two remaining cars will probably bring settlement at a similar rate, which will make the increase on the entire consignment about \$20,000 higher than the estimate. The Rambler-Cariboo company is now negotiating with several zinc ore buyers for a new smelting contract, and it is thought probable that shipment of zinc concentrate will be resumed about August 1. Reports from the Rambler-Cariboo mine state that there is about \$30,000 worth of zinc concentrate in store ready for shipment, and that consignments of silver-lead concentrate are being sent regularly to the Consolidated Company's smeltery at Trail. The belief is growing stronger among stockholders in the Rambler-Cariboo Company that the directors will in August or September authorize payment of a dividend. If so, this will be the first dividend to be paid by the company for about fifteen years.

From other sources it has been ascertained that several mines that had been idle for some years are once again to be worked, among them the Freddie Lee, situated in the neighborhood of Cody, which property was the first in the Slocan district to ship ore in bulk. Mortgagees resident in England are advertising inviting tenders for the Monitor and Ajax fraction, situated near Three Forks, a concentrating mill and equipment near Roseberry, Slocan lake, and the Bosun group lying between New Denver and Silverton. Both the Monitor and the Bosun were producing mines during the early flourishing times of mining in Slocan district, but were closed when conditions became unfavorable following the practical closing of the United States market to lead ores from British Columbia. These and several other English-owned mining properties in the Slocan are expected to again become producing mines, now that conditions are favorable to a resumption of work on them.

Boundary.

From Grand Forks has come news of more attention being paid to mining properties in North Fork of Kettle River district. The Gazette states that negotiations are under way for bonding the Gloucester group of mineral claims in Franklin camp to the Granby Consolidated Co., and it is expected that the transaction will shortly be arranged. The Gloucester group includes five claims, on which considerable development work has been done, both by shaft and adit. Some good ore has been opened; the value is principally in copper, the gold content being but small. The group adjoins the Union property, from which several hundred tons of ore, averaging \$80 a ton, has been shipped. Early in July, Mr. C. M. Campbell, superintendent of the Granby Consolidated Co.'s big copper mines at Phoenix, examined and sampled the Gloucester property, and it is stated that ore from a 50 ft. shaft gave excellent assay returns in copper. It is expected the Granby Co. will shortly do development work on the Gloucester. Many owners of mineral claims situated in Franklin camp hope that much good will result from the Granby Co. again turning its attention to that part of the district, in which there are known to be some promising mineral showings.

Atlin.

A few weeks ago another "fairy tale" given publicity in Vancouver was to the effect that a prospector had found a \$40,000 lump of gold "lying loose on the hanging wall of a quartz vein," and some comment was added to the news, which was alleged to have "come along the Government telegraph line to Vancouver," as follows: "To date Australia has held the banner with the 'Welcome Stranger' and 'Welcome' nuggets, but must now sit back for the 'daddy' of them all." Eventually the story was whittled down to a statement that Mrs. Alexander, wife of Captain Alexander, who owns the Engineer claim, had found "a pocket of nuggets on the surface of the vein." It seems consequently that it was not the "\$40,000 lump of gold" that was "lying."

Other Atlin news, which does not look like fiction, comes from Seattle, as follows: The year 1914 saw a very successful clean-up on the Atlin creeks. The year 1915 promises better, and if no further discoveries are made for 50 years the creeks have in sight material for active work for that period from properties already located. But there is a stampede now to Wilson creek, and there is no saying what may be in the future for the unprospected districts all around. Sam Fitzgerald has returned from the coast and expects to install a hydraulic plant on his placer property this season. Clarence Achison, son of E. W. Achison, of Skagway, is ground-slucing on his claim on Rose creek, with promising prospects. The O'Donnell River Partnership Company is again slucing, and the outlook for a good clean-up is more favorable than that of any previous year. Mr. Davis, of the McKee Creek Co., arrived by the first trip of the "Gleaner," accompanied by two Pittsburg financiers who are looking for investments. J. M. Ruffner, operating in Blue canyon, has his hydraulicking pipe all laid, has turned on a good sluice-head of water, and is now actively engaged in mining. Spruce creek will make a big showing this year, as many new operators have started work with first-class outfits and are now beginning to locate good pay. Mr. Matthews, who has valuable ground on Spruce creek, has shut down on account of lack of dump ground, as the creek claim owners are

working this season. Mr. Meyers, who owns valuable placer property on Rose creek, just above Blue canyon, arrived on the last steamer and is taking in with him two men to open his ground. The North Columbia Gold Mining Co. had a very satisfactory clean-up recently. James Tallmire has purchased an auto truck to be used in hauling freight and passengers. Louis Shultz has also received a passenger car and will shortly purchase a truck for freighting purposes. The McKee Creek Mining Co. expects to have a good season, as it has already had two clean-ups with very gratifying results. The company's new dam is almost completed; when finished it will hold sufficient water to run its plant for some time.

NEW YORK

The widespread improvement in the iron and steel trades over the country has been the talk of the fortnight, presaging as it invariably does general industrial prosperity. Iron ore mining is increasing at Lake Superior, and even in the Alabama districts where conditions have been unusually dull.

The extraordinary output of copper, particularly in Michigan, has tended to depress the price of the metal, pending further large buying orders.

Zinc ore concentrates in the Joplin, Missouri, district are selling at from \$80 to \$100, depending on the grade, a decline from a few weeks ago, following a similar decline in spelter prices. The strike of the miners in this district died a natural death; common-sense reasserted itself. Production is brisk.

Talk of the United States going to war is now hampering financial sentiment scarcely at all. Efforts by hysteria-mongers to scare somebody have fizzled out.

Although the bituminous coal trade is improving but slowly, the port of Hampton Roads, Virginia, is exporting record amounts, principally to the West Indies and Latin-America.

In 1914, the United States produced two-thirds of the world's petroleum, or 265,762,000 bbls. out of a total of slightly over 400,000,000 bbls. Next in quantity was Russia, which produced about one-sixth of the world's total. Mexico and Roumania rank next with 5.29 per cent. and 3.20 per cent. productions respectively.

In view of the importance of petroleum products for war uses, it is interesting to note that the combined outputs of Roumania, Dutch East Indies, Galicia, and Germany, which is the extreme limit of what Germany could possibly muster for herself, are less than 8 per cent. of the world's production, a total of less than 32,000,000 bbls., of which Germany's own contribution is less than a million bbls. The disposition of the production of the Dutch East Indies, in 1914 (including British Borneo) about 12,700,000 bbls., is problematical, as it is by no means likely that the different conflicting elements of the situation permitted Germany to acquire more than a fraction of this amount.

The United States Government is reported to have bought 500,000 oz. of silver on August 6, and will buy a like amount on August 13.

There is more interest being taken in Porcupine mines than for some time, due to the better outlook at the Dome, to confidence in Captain De Lamar's presidency of Dome, to Hollinger's excellent record, and to the several favorable minor developments at other properties.

Britain is importing petroleum at double the normal rate. Three-quarters of it is coming from the United States and one-quarter from the Far East and Mexico.

NEWFOUNDLAND

The output from the iron mines owned by the Dominion Iron and Steel Company and the Nova Scotia Company respectively continue weekly to increase. For weeks past the output of ore from these mines reached a total of 70,000 tons, which is much greater than the output at ordinary times. The Dominion Company's operations, however, are much more brisk than those of the Nova Scotia Company. The Dominion is now working a stock pile for exportation which had not been touched for a period of more than two years.

Practically all the ore exported by the Dominion Company is consigned to the smelters at Sydney. The Nova Scotia Steel Company will ship little if any ore to the United States this year as it formerly did. A larger market, we understand, than usual, has been secured in Great Britain. Middlesbro in former years was the principal receiving port; but this year the ore will be sent to several ports. Owing to the high freights prevailing the profits on ore may not be so satisfactory as formerly.

Gangs of men are being taken on by these companies regularly and in a few days a record output is expected to take place. It is understood that sufficient orders have been placed with the companies to keep operations going up to the close of navigation.

The mine at Tilt Cove, the property of the Cape Copper Company, which had been worked at intervals for over sixty years, but which of late years had been left inoperative, is now working on a fairly large scale again, and we understand as time goes on work there will become more brisk. Already a few cargoes of copper have been shipped from the mine since opening up this season.

Another copper mine, located in the district of Harbour, has just been opened up. Apparatus and equipment have lately been installed and gangs of men are now working there. The ore is said to be of high grade and in a short while more extensive operations are expected to be begun.

By what is considered very sharp work a very valuable copper claim was recently secured by some local parties. The claim had been held for years, and this year negotiations were being conducted prior to an opening up or a sale. The claim, by accident, over lapsed for a day or two, and before it could be retaken by the original parties they found themselves ousted completely by another party. The action in question drew condemnation from most of the local press.

A new company, the Newfoundland Products Corporation, which expects very soon to start the erection of a large plant at Bay of Island will require for consumption in its factories 657 tons of phosphate rock or 239,805 tons yearly; 219,000 tons of coal per year as well as 40 tons of iron pyrites. None of these minerals and mineral ores exist in workable quantities in Newfoundland, and hence they must needs be imported.

Some activity is being manifested by those interested in mines, etc., for the acquisition of slate quarries. It is thought that these quarries will be secured with a view to the necessity that is bound to be felt in Europe for slate used in roofing purposes after the war.

In Newfoundland there are several slate quarries which contain slate of an excellent quality. Some of these quarries have been worked with very good results. In view of the comparative proximity of Newfoundland to Europe it is not improbable that an industry of this nature might be developed.

PORCUPINE, KIRKLAND LAKE, SESEKINIKIA AND MUNROE TOWNSHIP

The progress of the Porcupine camp during the past six months is more marked than for any previous year of the gold camp's existence. It is very largely due to the phenomenal development of the new ore body at the Dome mines. This orebody has now been developed for three levels of 100 ft. each; the average width of the orebody is 100 ft. The known length is 330 ft. This is a distinct orebody, separate from the Dome and what was known as the Gold Stairway vein. Very little of this ore has as yet been stoped, but an increasing amount of it will be available as development is continued. The shaft has been carried down to the 800 ft. level, but it is not proposed to cut a station before 850 ft. as levels are being opened up only at intervals of 150 ft. The lowest developed level at present is the 6th or 550 ft. A station has been cut at the 700 ft. level, and ore is already being developed there. The huge crusher has been lowered down the mine to the 6th level. As this crusher is the biggest crusher being used for this kind of work underground, the work of lowering it down the mine was delicate and required considerable time. It should be installed and doing work in a month or six weeks. The production of the Dome for the month of July was \$131,000 in bullion recovered; tonnage showed considerable increase, amounting to 28,300 tons for the period. The average mill heads ran nearly \$5.00, of which \$4.62 per ton was recovered. In order to give the ore coming from the new orebody a longer treatment the cyanide tanks in the mill have been raised. There is a considerable amount of coarse gold in the new orebody, and to enable the management to get a good extraction it was found necessary to make this change.

Although the Dome Lake Mining Company is still working from hand to mouth the development for the past two months has been far more encouraging. On the 400 ft. level the second ore shoot has been developed for about 40 ft. It is running very satisfactorily; an average grade of \$18 to \$20 being recovered across 3 ft. The second stock pile is now being treated in the mill; two-thirds of the ore treated comes from the dump, one-third from development at the 400-ft. level, from the winze at the 180 ft. level and from the A shaft. The A shaft is developing very satisfactorily. The vein at 64 ft. dipped into the wall, but a few shots showed that it was fully as high grade as in the shaft. It will be followed down on an incline. The clean-ups from the mill for the past three months have been running about \$10,000 in bullion and \$500 in concentrates. Owing to the non-delivery of a car of coal it was found necessary for some time to discontinue the use of the tube mill, as two-thirds of the saving was made in the tube mill previously. The ore is now being run through a 20-mesh screen below the stamps.

Progress is now being made to carry the winze on the Vipond below the 430 ft. level, at which it was halted. Development is being continued on the vein on the 400 ft. level with fair results. The winze will be carried down to the 500 ft. level without delay. During the month of July the mill treated about 3,670 tons, or a daily average of about 120 tons. The average value of the mill heads was about \$8.75 and recovery was upwards of 94 per cent. The total amount of bullion recovered was well over \$30,000. Total costs were approximately \$5.00 a ton.

The Canadian Mining and Finance Company has decided to develop the Gillies claim. A shaft will at once be started about 200 ft. from the Vipond line. It will be carried to the 500 ft. level without delay. As the Vipond has developed to within a few feet of the party wall dividing the two properties, the chance of picking up the extensions of their vein is considered excellent. The shaft will be sunk in the most convenient place obtainable, in the country rock.

The Hollinger will very soon be connected with the main working shaft, to the Millerton. A long crosscut from the Hollinger to the No. 6 shaft of the Millerton is within 125 ft. of its objective. Some years ago, when the Millerton was being prospected, a shaft was sunk to the 100 ft. level and the orebody developed; this orebody is about 100 ft. wide and appears to have an average grade of about \$7. The connection between the two properties will be made at the 425 ft. level; the main working level of the Hollinger. The ore will be drawn from the Millerton to the central hoisting shaft of the Hollinger by electric locomotives.

The McIntyre has consolidated its holdings by the purchase of the Pearl Lake Mining Company. The official announcement of the new president, Col. A. M. Hay, states that the Pearl Lake shaft will be used as a central hoisting shaft for all operations of the McIntyre on the north side of the lake. The shaft, which is now down on the Pearl Lake to 650 ft., will be carried down to the 750 ft., from which level operations both on the Pearl Lake and the No. 5 vein system on the McIntyre will be conducted. In the sale the McIntyre is obliged to expend \$1,000 a month on development on Pearl Lake. For control the McIntyre paid \$47,000 and obtained 1,020,000 shares of the new company formed, called the McIntyre Extension, Limited. This amount liquidates all debts with the exception of those held by B. E. Cartwright. For his \$157,000 B. E. Cartwright gets 980,000 shares of the new McIntyre Extension stock.

The deal whereby the McIntyre was to obtain control of the Jupiter has fallen through.

At the Schumacher mill all the machinery is in place, but final adjustments have yet to be made. It is fully expected, however, that a trial run will be made on or about August 25th.

The option on the Gibson claim at Good Fish have been taken up by the Buffalo syndicate, of which Mr. Frank Loring is the head. The second payment on these claims was to be made on August 20th. So good are they looking that it is likely that further payments will be anticipated and the full purchase price will be paid the owners the middle of this month.

COBALT, GOWGANDA AND SOUTH LORRAIN

The continued low price of silver and the great uncertainty of the market owing to the war has caused considerable pessimism among mine managers and mine owners in the Cobalt camp. It is not estimated that the price of silver is now such that profits cannot be made; but rather the fear of a much lower price owing to inability to sell silver at its present quoted value. It is believed that great stocks of silver are being held in the large money centres of the world. It is also known that many silver-lead deposits which were not being worked

previously have, owing to the high price of lead, been opened up again. Although the silver produced is a by-product, it nevertheless amounts to a great deal in the aggregate, and is accumulating fast. It is also stated that China is selling rather than buying silver. India is not buying, although the monsoon is good and the estimated crops are much larger than last year. Rumors have been circulated that several mines have determined to close down, but this rumor so far has no foundation; on the other hand the opinion that the normal situation will be resumed after the war is over is reflected in the disposition to open up old silver prospects. Money is now available for the financing of companies to do developing which was not obtainable six months ago. A case in point is that of the United States Cobalt; a prospect which has not been worked since 1907. The Rochester, the Old Pan Silver, the Shamrock, the Columbus and the Twentieth Century are all prospects which have been closed down and which are now working or about to be worked in a very short time.

Bullion shipments, which practically ceased at the latter part of July, have been resumed again in full volume, as companies appear to feel there is little chance of a betterment in price within the next month or six weeks. The ore shipments continue about normal, as smelters are quite willing to take all ore shipped at current prices and pay for the same in full on the usual terms.

Litigation in regard to the Gould lease having now been settled, that lease passes out and is replaced by the Mercer Silver mines flotation, closely identified with the Seneca Superior Mines, Limited. The Gould has already been pumped out by the new company and work has been resumed. Development will be carried on energetically and with good promise of success. The new company which is to take up the lease of the United States Cobalt property, just north of the Hudson Bay mine, is a Rochester flotation, and will be known as the Genessee Silver Mining Company. Although this property is in the conglomerate, it has not been worked since the very early days of the camp. Beyond the sinking of a 60 ft. shaft no work has ever been attempted here. A few strong calcite veins have been found on the surface, but silver values are very low. It is intended to sink a shaft down to within measurable distance of the contact with the Keewatin before any lateral work is attempted.

The Trethewey Cobalt Mining Company has definitely assumed control of the Rochester prospect in Southeast Coleman. It is expected that terms will be arranged whereby the Trethewey will be able to use the shaft and workings of the Lumsden in order to carry out exploration work on the Rochester. This will be all the easier since a crosscut was run into the Rochester for the purpose of exploration by the Lumsden, some time ago. The old shaft on the Rochester is being pumped out, but it is not anticipated that much development will be attempted there.

The Nipissing Mining Company in July produced two or three thousand dollars' worth more ore than in the preceding month of June. The shipments, however, showed a falling off of almost \$100,000. Of the 179,998 oz. produced, 99,039 oz. is credited to high grade ore and 80,959 oz. to low grade ore. The high grade mill treated 37 tons and shipped 550,221 oz. of silver, and the low grade mill treated 69.60 tons. There is nothing of particular interest at the main working shaft No.

73, beyond the fact that two branch veins on the 4th level are proving of sufficient interest to warrant more exploration. No. 80 is again being worked. It is of interest to know that some crosscutting is being done from the second level on shaft 64 into new territory. From the tunnel level, where work has been resumed, No. 96 vein is showing much improvement. It was at first but a small vein of low grade ore; it is an inch wide of 2,000 oz. ore. On Peterson lake, where two drills are developing veins found by the hydraulic last year, the best vein assays 2,000 oz. over a width of two inches.

In Gowganda the once notorious mine known as the Bartlett failed to elicit a bid of more than \$6,000 at a recent sale. As this did not nearly reach the reserve placed by the liquidators on the property, it was withdrawn.

It is most probable that the Kerr Lake Mining Company will take over the old Drummond, now known in the camp as the Cobalt Comet. The Kerr Lake already have a half interest in the Drummond Fraction, which is the buffer property between the Kerr Lake and the Cobalt Comet. They will be able to work the whole of the ground very conveniently. The Drummond was bought by Messrs. E. P. Earle and David Fasken at the time the proposal to pump out Kerr lake was made. The Drummonds objected, and the settlement was only made after the case had been taken to the Privy Council. On purchasing the property the new owners sold 6½ acres under Kerr lake to Crown Reserve and the Kerr Lake Cos., so that they might be able to pump out the lake. This 6½ acres was worked jointly by the two companies as the Drummond Fraction. The remainder was incorporated as the Cobalt Comet; the holding Company in New York being the Caribou Cobalt.

Construction has been commenced on an addition to the Coniagas mill, which will enable that company to re-treat their slime tails and cyanide them. The mill tails from the Coniagas now amount to 70 or 80 tons a day of the 180 tons treated. These slimes, which are now running to waste, contain about 6 oz. of silver to the ton, and it is expected that the new addition will make a further saving of 3 oz. a ton. To treat the slimes 24 canvas tables will be installed. The canvas will be laid on a concrete floor as in the old mill. From the 70 to 80 tons of slime tails, it is expected that about 3 tons of concentrates will be produced. To treat these concentrates a small cyanide plant will be built. The other 3 tons will come from the slimes produced at the trommels and the drag classifier. This product assayed about 100 oz. to the ton and previously has been shipped direct to the smelter. It will now be cyanided.

INTERNATIONAL NICKEL.

According to the Boston News Bureau, the International Nickel Company may capitalize a portion of its surplus before the end of the current year. This item now approximates \$7,000,000, and as the company needs a working capital of not more than \$1,000,000, a stock dividend is probable. Monthly net earnings of the company are said to be running close to \$850,000. With practically a monopoly of the nickel industry, at least on this side of the Atlantic, the International Company has been enjoying a wonderful business from ordinary as well as "war" demand sources. Its ore supply comes from Canada, while the

refining takes place in New Jersey. The ore carries important copper values and of late the copper production has been averaging about 3,000,000 lb. monthly. Thus in addition to its sales of nickel at high prices the International Company has been deriving substantial benefits from the high copper prices.

CONIAGAS.

Cobalt, August 8.

The Coniagas is the latest mining company in the Cobalt camp to erect a cyanide mill. The erection of a small one is now in progress on the property, and is expected to be completed and in running order in about two months' time. It is the intention of the management to retreat the present slime tailings as is being done by the Mining Corporation of Canada in the new mill put in operation a short time ago. The tailings will be retreated over canvas, and for this purpose over 4,000 square yards of canvas will be used. The concentrates from the canvas table will in turn be treated in the cyanide plant along with the mill tailings. The precipitate obtained will be refined at the company's smelter at Thorold, Ont. The construction of the new plant will make possible the recovery of the silver remaining in the slimes from the mill, which have all along been going to waste.

DOMINE MINE.

Dome Mines Company has declared an initial quarterly dividend of 50 cents a share. This places the stock on a 20 per cent. per annum basis. The dividend is payable September 1, to stock of record August 23. As new stock recently offered to shareholders at par is payable August 16, it will participate in dividend just declared. The Dome Mines Company mill has a capacity of about 28,000 tons a month but through the substitution of rolls for the existing 80 stamps at a very small cost, it is expected that capacity will be increased to about 45,000 tons a month. Capt. De Lamar, president of the company says:

"The larger production should be attained by the end of the current year with no interruption to operations during alterations. But this does not measure the productive capacity a year or two ahead for a new mill to treat 3,000 tons of ore daily will be started just as soon as the mine has been opened up sufficiently to furnish the ore. From a position of having no working capital to prosecute development work the Dome Company now has \$500,000 from earnings and with payments made for new stock lately offered stockholders at \$10 a share it will soon come into possession of an additional like sum to be devoted to development. During the past four months substantial results have been accomplished particularly in the work of increasing ore reserves. At the present time they approximate \$15,000,000 to \$18,000,000 of \$8 ore which as on March 31 they aggregated but \$11,000,000. Two years ago reserves amounted to \$2,375,000 of \$7.50 ore. Material savings in costs have been effected during the past year, the average for the fiscal period being \$2.96, a drop of \$1.23 a ton. Since March the cost has been further lowered to about \$2.25 a ton with additional savings in sight. The mill has been extracting better than 93 per cent. but in the future it is expected that tonnage will be crowded more than heretofore, somewhat at the expense of recovery. In dollars and cents the net return from a greater tonnage and slightly lower extraction would be more beneficial from stockholders' point of view."

MARKETS

TORONTO MARKETS.

Aug. 10—(Quotations from Canada Metal Co., Toronto)—

- Spelter, 25 cents per lb.
- Lead, 6¾ cents per lb.
- Tin, 40 cents per lb.
- Antimony, 40 cents per lb.
- Copper casting, 20 cents per lb.
- Electrolytic, 20 cents per lb.
- Ingot brass, yellow, 13c.; red, 15 cents per lb.

Aug. 10—(Quotations from Elias Rogers Co., Toronto)—

- Coal, anthracite, \$7.50 per ton.
- Coal, bituminous, \$5.25 per ton.

NEW YORK MARKETS.

Aug. 6—Connellsville coke (f.o.b. ovens)—

- Furnace coke, prompt, \$1.50 per ton.
- Foundry coke, prompt, \$2.10 to \$2.40 per ton.

Aug. 6—Tin, straits, 34.62½ cents.

- Copper, Prime Lake, 18.12½ to 18.37½ cents.
- Electrolytic copper, 17.87½ to 18.12½ cents.
- Copper wire, 19.25 to 19.50 cents.
- Lead, 5.00 to 5.25 cents.
- Spelter, 16.50 to 16.75 cents.
- Sheet zinc (f.o.b. smelter), 21.00 cents.
- Aluminum, 32.00 to 34.00 cents.
- Nickel, 50.00 to 52.00 cents.
- Platinum, soft, \$40.00 per ounce.
- Platinum, hard, 10 p.c., \$42.00 per ounce.
- Bismuth, \$2.75 to \$3.00 per lb.
- Quicksilver, \$92.00 to \$94.00 per 75-lb. flask.

SILVER PRICES.

	New York.	London.
	cents.	pence.
July—		
24.	47¼	22⅞
26.	47⅞	22½
27.	47⅞	22½
28.	47½	22½
29.	46⅞	22⅞
30.	47⅞	22⅞
31.	47⅞	22⅞
August—		
2.	47⅞	22⅞
3.	47⅞	22⅞
4.	47⅞	22⅞
5.	47	22⅞
6.	47⅞	22⅞

STOCK QUOTATIONS.

(By courtesy of J. P. Bickell & Company, Standard Bank Building, Toronto.)

	New York Curb.	Bid.	Ask.
Alaska Gold	32.37½	32.75	
British Copper . . . . .	.50	1.00	
Braden Copper	7.75	7.87½	
California Oil	306.00	310.00	
Chino Copper	44.75	44.87½	
Giroux Copper . . . . .	.50	1.50	

Goldfield Cons.	1.25	1.28½
Green Cananea	40.00	42.00
Granby.	83.00	84.00
Inspiration Copper	33.12½	33.37½
International Nickel	180.00	182.00
Miami Copper	25.87½	26.00
Nevada Copper	1.62½	1.75
Ohio Oil	147.00	149.00
Ray Cons. Copper	22.12½	22.37½
Standard Oil of N. Y.	198.00	200.00
Standard Oil of N. J.	410.00	416.00
Standard Oil (old)	1375.00	....
Standard Oil (subs)	975.00	....
Tonopah Mining	5.00	5.37½
Tonopah Belmont	3.87½	4.12½
Tonopah Merger	35.00	37.00
Yukon Gold	2.25	2.62½

Porcupine Stocks.

	Bid.	Ask.
Apex. . . . .	.02¾	.03
Dome Extension . . . . .	.19¼	.20½
Dome Lake . . . . .	.26	.26½
Dome Mines	21.75	22.50
Foley O'Brien . . . . .	.30	.33
Hollinger. . . . .	.24	.25
Jupiter. . . . .	.11¼	.11½
McIntyre. . . . .	.46¾	.47
Moneta. . . . .	....	.08
Pearl Lake . . . . .	.03½	.03½
Porcupine Gold . . . . .	....	.00¾
Porcupine Imperial . . . . .	.06½	.06¾
Porcupine Crown . . . . .	.70	.80
Preston East Dome . . . . .	.04⅞	.05¼
Porcupine Vipond . . . . .	.61½	.62½
Porcupine Tisdale . . . . .	....	.02½
West Dome . . . . .	.08¾	.09

Cobalt Stocks.

	Bid.	Ask.
Bailey. . . . .	.02½	.02⅞
Beaver. . . . .	.27	.29
Buffalo. . . . .	.35	.55
Chambers Ferland . . . . .	.12	.15
Coniagas.	3.65	4.00
Crown Reserve . . . . .	.40	.43
Foster. . . . .	....	.04
Gifford. . . . .	.01½	.02
Gold Reef . . . . .	....	.00¾
Gould. . . . .	.00¼	.00¾
Great Northern . . . . .	.02	.02¼
Hargraves. . . . .	.01	.01½
Hudson Bay . . . . .	.19	.22
Kerr Lake	3.00	3.50
La Rose . . . . .	.44	.54
McKinley. . . . .	.18	.22
Nipissing.	5.00	5.25
Peterson Lake . . . . .	.18½	.19
Right of Way . . . . .	.03½	.04
Silver Leaf . . . . .	.02	.02½
Teck Hughes . . . . .	.05	.06
Temiskaming. . . . .	.30¼	.30¾
Trethewey. . . . .	.10	.12
Wettlaufer. . . . .	.03	.05
Seneca Superior . . . . .	....	.90
Homestakes. . . . .	.17	.19
York, Ontario . . . . .	.01½	.04

PROFESSIONAL DIRECTORY.

The very best advice that the publishers of the Canadian Mining Journal can give to intending purchasers of mining stock is to consult a responsible Mining Engineer BEFORE accepting the prospectus of the mining company that is offered them. We would also strongly advise those who possess properties that show signs of minerals not to hesitate to send samples and to consult a chemist or assayer. Those who have claims and who require the services of a lawyer, with a thorough knowledge of Mining Law, should be very careful with whom they place their business.

ENGINEERS, METALLURGISTS AND GEOLOGISTS.

Ontario Cohen, S. W. Campbell & Deyell. Carter, W. E. H. Ferrier, W. F. Forbes, D. L. H. Gwillim, J. C. Hassan, A. A.	Haultain, H. E. T. Segsworth, Walter E. Smith, Alex H. Smith, Sydney. Maurice W. Summerhayes. Tyrrell, J. B.	Quebec Burchell, Geo. B. Cohen, S. W. DePencier, H. P. Hardman, J. E. Hersey, Milton L. Johnson, W. S. Smith, W. H.	British Columbia Brown & Butters. Fowler, S. S. FOREIGN-New York Canadian Mining & Exploration Co., Ltd. Colvocoresses, Geo. M. Dorr, Jno. V.N. Hassan, A. A.
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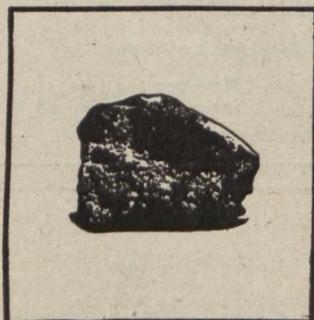
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Map 39A. Geological Map of Nova Scotia.
Map 121A. Franey Mine and Vicinity, Victoria County, N. S.

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Map 95A. Broadback River, Mistassini Territory, Quebec. Geology.
Map 100A. Bell River, Quebec. Geology.

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Map 124A. Wanapitei (Falconbridge, Street, Awrey, and Parts of Maclellan and Scadding Townships), Sudbury District, Ont. Geology.
Map 49A. Orillia sheet, Simcoe and Ontario Counties, Ontario. Topography.

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Map 55A. Geological map of Alberta, Saskatchewan and Manitoba.
Map 117A. Wood Mountain Coal Area, Saskatchewan.

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Map 33A. Nanaimo sheet, Vancouver Island, British Columbia. Topography.
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Map 72A. Saanich sheet, Vancouver Island. Geology.
Map 109A. Prescott, Paxton and Lake Mines, Texada Island. Topography.

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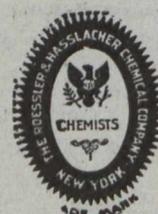
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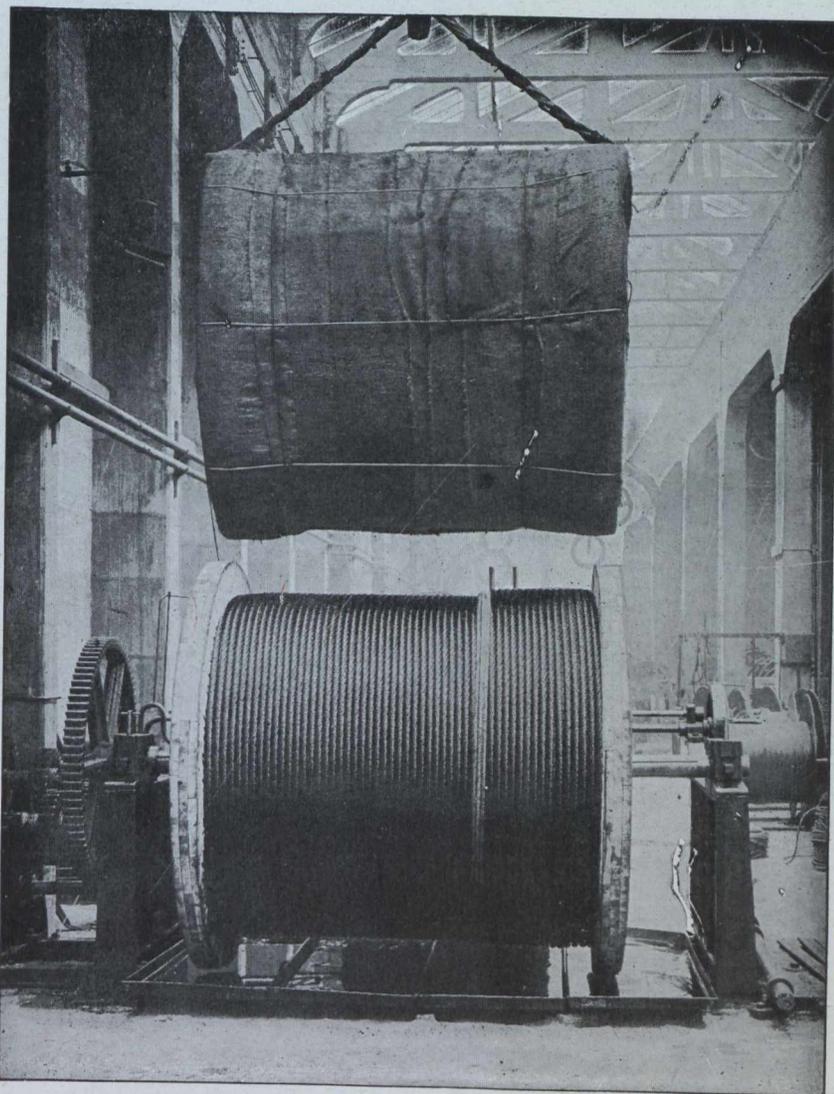
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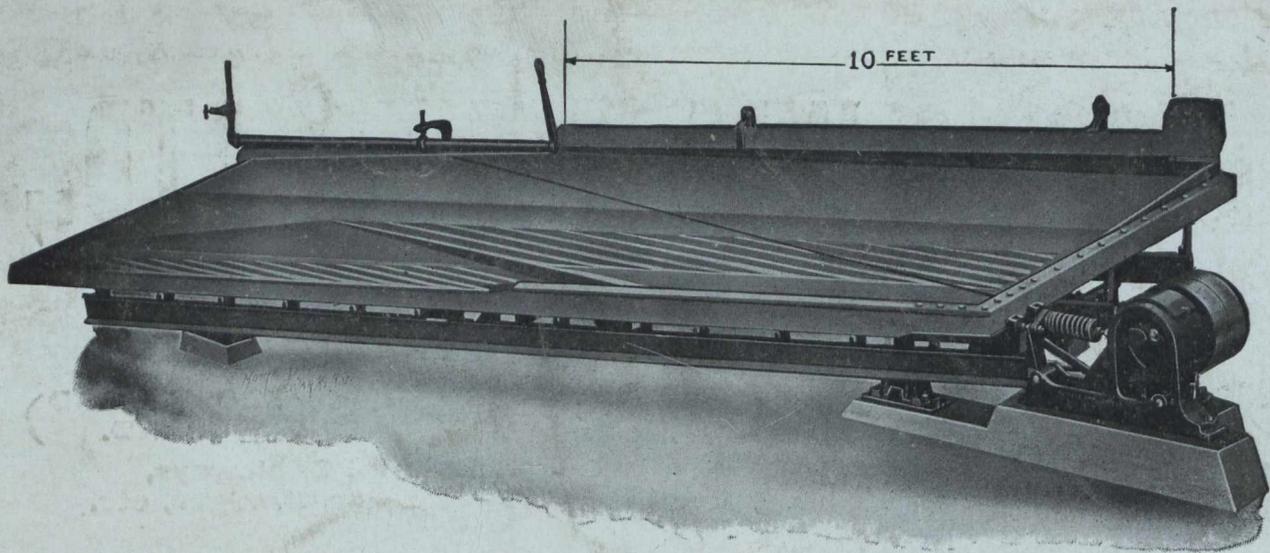
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