

May 15, 1918

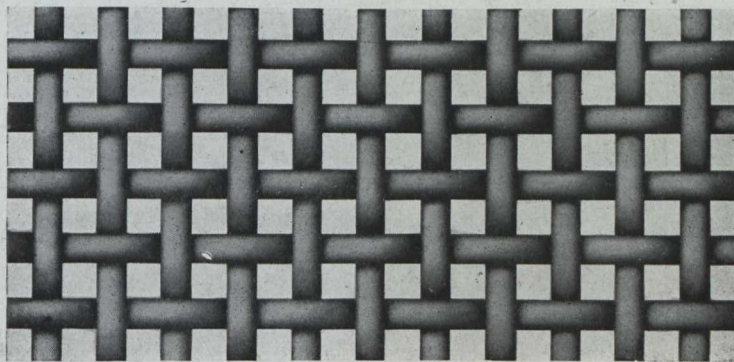
Single Copies 15 Cents

# CANADIAN MINING JOURNAL

VOL. XXXIX

TORONTO

No. 10



THE B. GREENING WIRE CO., LIMITED  
HAMILTON, CANADA

The Canadian Mining Journal, Purman Bldg., 263-265 Adelaide St. West, Toronto, Ont.

# Balance!

The balance of the reciprocating masses and movements in the horizontal and vertical members of

## Sullivan Angle Compound Air Compressors

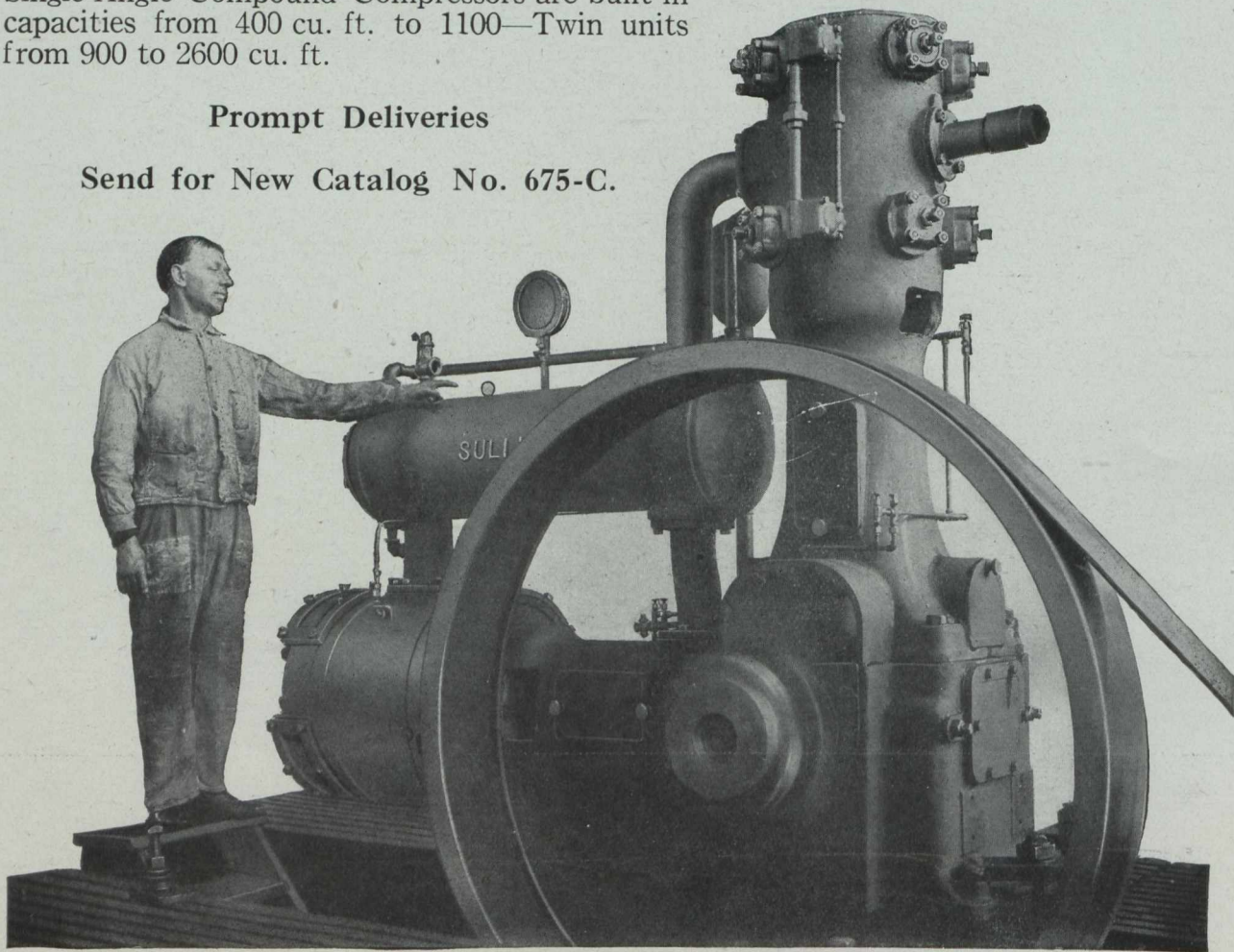
is so perfect that a coin will stand on edge on the machine, when running at full speed, without the foundation bolt nuts.

This balance and smoothness of operation saves for useful work power lost in other types of compressors in overcoming vibration and friction. It saves foundation cost, permits lighter construction, and smaller floor space, and enables safe operation at high speeds.

Single Angle Compound Compressors are built in capacities from 400 cu. ft. to 1100—Twin units from 900 to 2600 cu. ft.

Prompt Deliveries

Send for New Catalog No. 675-C.



# SULLIVAN MACHINERY CO.

122 South Michigan Avenue, Chicago

TORONTO

BOSTON

SPOKANE

NELSON

VANCOUVER

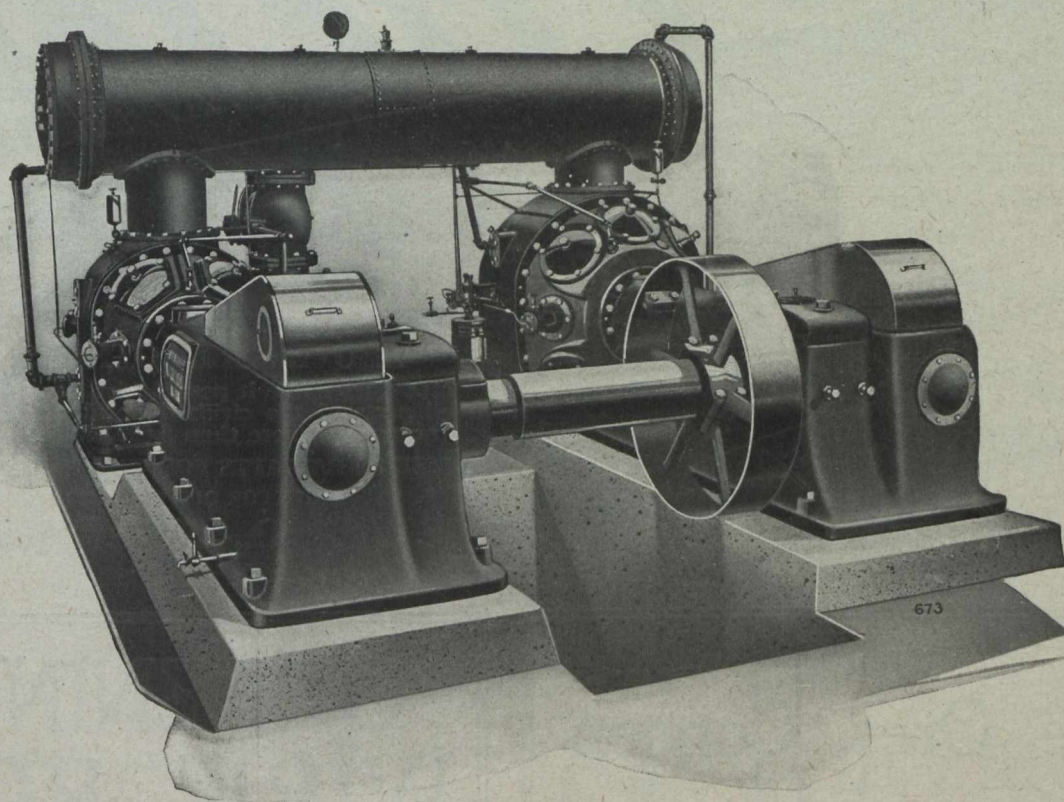


# THE CIRCO PAGE

Illustrating Compressed Air Machinery, Tools, and Appliances



## The "Pre-2" Direct Connected Air Compressor



### A Great Combination

**DIRECT ELECTRIC DRIVE**--the use of self-starting synchronous motors gives you electric power at the very cheapest rate.

**INGERSOLL-ROGLER AIR VALVES** -- no valve gear, positive action, nothing to get out of order--silent, quick, efficient action.

Let us send you BULLETIN 3026: it shows you the other notable features of these compressors, and how they spell E-C-O-N-O-M-Y.

## Canadian Ingersoll-Rand Company, Limited

General Offices: 260 St. James Street,

**MONTREAL, QUE.**

Branches: Sydney, Sherbrooke, Montreal, Toronto, Cobalt, Timmins, Winnipeg, Nelson, Vancouver

**HOYT METALS**

**ABOVE ALL OTHERS**

Sheer Merit has made it possible for Hoyt Metals to reach all parts of the civilized world at an annual turnover of more than 5,000,000 dollars.

WE SPECIALIZE IN BABBITTS FOR THE MINING INDUSTRY  
WRITE FOR OUR CATALOG

**HOYT METAL CO.,** EASTERN AVE. Toronto, Canada  
New York, N.Y. and LEWIS ST. London, Eng. St. Louis, Mo.

YOUR  
**Fine Ores, Concentrates and Fluedust**

Can be Cheaply and Successfully  
Sintered by the

**DWIGHT & LLOYD  
SYSTEM**

(Fully Protected by Patents.)

SIMPLE, EFFICIENT, CONTINUOUS  
LOW COST OF INSTALLATION

Many plants now in daily operation in U.S., Dominion of Canada, Republic of Mexico, Australia and European Countries. For particulars as to Licenses in Canada, Estimates, etc., address

**Dwight & Lloyd Sintering Co., Inc.**

(Successor to Dwight & Lloyd Metallurgical Co.)

29 Broadway, New York.

Cable Address: SINTERER, NEW YORK

"For information regarding sintering of iron ores and iron flue dust, consult special licenses."

**American Ore Reclamation Co.**

71 BROADWAY, N.Y.

**GREENING'S  
WIRE ROPE  
AND SCREENS**

Are Manufactured Specially for  
Conditions in this District, and are  
without doubt THE BEST.

Orders for this Material Receive Special  
Attention. Large Stocks of WIRE  
ROPE carried at all branches.

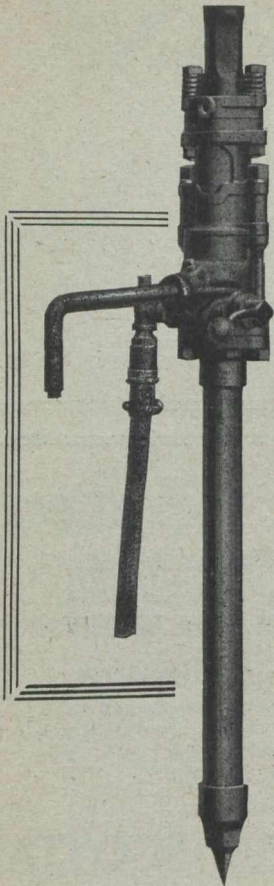
FOR SALE BY

**Northern Canada Supply Co.**

LIMITED

Head Office: HAILEYBURY

Branches: Cobalt, Haileybury, South Porcupine, Timmins



## Conserve Your Man Power and Reduce Operating Expenses

The first is absolutely necessary from a patriotic standpoint—the second is the first thought of every successful business man. Both can be accomplished when you install the “New Cleveland” Stoper in your mine. It has speed, with staying power and efficiency, double that of any other drill on the market. It has lower operating expenses, because of its low air consumption, and its economy in repairs, through its dropped forged parts of simple design which are practically unbreakable.

We can prove these facts by use if you will only write for our Bulletin No. 35A.

### CLEVELAND PNEUMATIC TOOL COMPANY

Of Canada, Limited

84 CHESTNUT ST.,

TORONTO, ONTARIO

#### Used Mining Equipment for Immediate Delivery

##### SUBJECT TO INSPECTION

Blake Crushers.  
Fraser Chalmers Tube Mill  
and Motor.  
Power and Mining Tube  
Mill and Motor.  
Hardinge Ball Mill.  
Air Compressor with Motors.  
Oliver Filters.  
Alken Filters.

Pumps.  
Tanks.  
Belting.  
Pulleys.  
Boilers.  
Steel Drills.  
Sixteen-pound Rails.  
Lighting Generators.

ZENITH COAL AND STEEL PRODUCTS LIMITED,  
McGILL BUILDING, MONTREAL

#### Milling and Mining Machinery

Shafting, Pulleys, Gearing, Hangers,  
Boilers, Engines, and Steam Pumps,  
Chilled Car Wheels and Car Castings,  
Brass and Iron Castings of every de-  
scription, Light and Heavy Forgings.

Alex. Fleck, Ltd. - Ottawa

## Announcement

We have started our new Plate  
Mill, and are Manufacturing  
Plate from  $\frac{1}{4}$  in. to  $\frac{3}{4}$  in. thick,  
24 in. wide, any weight up to  
500 pounds.

### Dominion Steel Foundry Co., Limited

Hamilton, Ont.

# E. J. LONGYEAR COMPANY

## EXPLORING ENGINEERS

Diamond Drill Contractors and Manufacturers

Examination and Exploration of Mineral Lands

Shaft Sinking and Development

MINNEAPOLIS, MINNESOTA, U. S. A.

Tucson Arizona

Marquette, Michigan

St. Louis, Missouri

Sudbury, Ontario

## Nova Scotia Steel and Coal Co., Limited

Proprietors, Miners and Shippers of SYDNEY MINES BITUMINOUS COAL. Unexcelled Fuel for Steamships and Locomotives, Manufactories, Rolling Mills, Forges, Glass Works, Brick and Lime Burning, Coke, Gas Works, and for the Manufacture of Steel, Iron, Etc. COLLIERIES AT SYDNEY MINES, CAPE BRETON.

Manufacturers of Hammered and Rolled Steel for Mining Purposes

Pit Rails, T Rails, Edge Rails, Fish Plates, Bevelled Steel Screen Bars, Forged Steel Stamper Shoes and Dies, Blued Machinery Steel 3-8" to 1-4" Diameter, Steel Tub. Axles Cut to Length, Crow Bar Steel, Wedge Steel, Hammer Steel, Pick Steel, Draw Bar Steel, Forging of all kinds, Bright Compressed Shafting 5-8" to 5" true to 2/1000 part of an inch. A full stock of Mild Flat, Rivet Round and Angle Steels always on hand.

SPECIAL ATTENTION PAID TO MINERS' REQUIREMENTS. CORRESPONDENCE SOLICITED.

Steel Works and Head Office: **NEW GLASGOW, NOVA SCOTIA**

## EVERITT & CO.

40 CHAPEL STREET, LIVERPOOL, ENGLAND

Tel. Address: "PERSISTENT"

Codes Used  
A.B.C. 4th and 5th Editions.  
A1 Code  
Lieber's Code,  
Western Union Code.  
Moreing & Neal's Code  
Bedford & McNeil's Mining Cod

**BUYERS OF CANADIAN MINERALS, METALS, ALLOYS, METALLIC RESIDUES,  
COBALT ORE, OXIDE, RESIDUES, NICKEL ORE, OXIDE, ETC.**

**MOLYBDENITE, WOLFRAM, SCHEELITE, MANGANESE ORE, CHROME ORE, CORUNDUM, GRAPHITE  
METALS & ALLOYS**

**COBALT, TUNGSTEN, MOLYBDENUM, NICKEL, ALUMINIUM, FERRO - SILICON, FERRO - CHROME, ETC.**

**ASBESTOS—CRUDE, FIBRES, SHINGLE STOCK.**

# NICKEL



**THE MOND NICKEL COMPANY, LTD**

39 Victoria Street, London, S.W.

Also Makers of

Copper Sulphate,

Nickel Sulphate, and

Nickel Ammonium Sulphate



**Send Us a Name  
and  
We'll Send You a Lamp**

Send us the name of your engineer or foreman and we will send you one of our ITP lamps, to be used for 30 days at our expense.

If it's worth its price, send your check; if not, say so and you owe us nothing.

We want to get an ITP in your mine and have its use convince you that it's the lamp you should use.

Please mention kind of lamp now used.  
A postal will bring catalog.

**DEWAR MANUFACTURING CO., Inc.**  
100 Wellington St. West, Toronto, Ontario



# Worms & Worm Gears



**CUT GEARS**

**Accurate Work at Right Prices**

GET OUR QUOTATIONS

**HAMILTON GEAR & MACHINE CO.**  
VAN HORNE STREET TORONTO

# Goldsmith Bros.

**Smelting & Refining Co., Limited**  
24 Adelaide St. W., Toronto,  
New York Chicago Seattle

Refiners and Smelters

## Platinum, Gold and Silver

PROMPT AND ACCURATE RETURNS

# WOOD TANKS

for all purposes



**Goold, Shapley & Muir Co. Limited**  
BRANTFORD, ONT.

# DIAMOND DRILL CONTRACTING CO.

SPOKANE, - WASHINGTON.

*Contractors for all kinds of Diamond Drill Work.  
Complete Outfits in Alberta and British Columbia.  
Write for Prices.*

AGENCY :-  
**ROSSLAND, B. C.**

**American Zinc Lead and Smelting Co.**

Purchasers of

# ZINC and LEAD ORES

Address  
1012 Pierce Building, St. Louis, Mo.

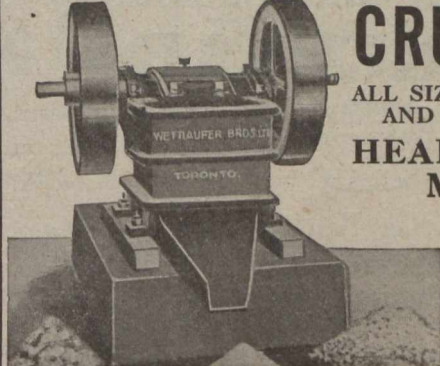
Exploration Department

For the purchase of

# MINES

**Gold - Silver - Lead - Zinc - Copper**

Address  
55 Congress Street, Boston, Mass.



# CRUSHERS

ALL SIZES AND STYLES AND GUARANTEED

## HEART SHAPE MIXERS

Rolls, Brick, Block  
Tile Machines  
Hoists, Screens, etc.  
Concrete Machinery.  
Full line.

Made in Canada  
by a Canadian Firm

Write for Catalog and Special Offers

**WETT LAUFER BROS. LIMITED - TORONTO, ONT**



# BERGER

Monitor Transits & Levels  
FOR USE IN MINES

**C. L. BERGER & SONS**  
BOSTON, MASS., U. S. A.



# NICKEL

Shot—High and Low carbon.

Ingots—Two sizes, 25 lbs., 50 lbs.

**ELECTROLYTIC NICKEL—99.80%**

Prime Metals for the Manufacture of Nickel Steel, German Silver, Anodes and all remelting purposes. Our Nickel is produced as Rods, Sheets, Strip Stock, Wire and Tubes.

**MONEL  
METAL**

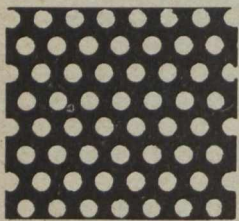
We are **SOLE PRODUCERS** of this natural, stronger-than-steel, non-corrodible alloy.

Manufactured forms are Rods, Flats, Castings, Tubes, Sheets, Strip Stock and Wire.

*Send Enquiries Direct to Us*

(Reg. U.S. Pat. Off.)

**THE INTERNATIONAL NICKEL COMPANY**  
43 Exchange Place, - NEW YORK



## PERFORATED METALS *For Every and All Purposes in all Metals*

Elevator Buckets (plain and perforated).  
Conveyor Flights and Trough, also  
General Sheet Iron Work.

**HENDRICK MANUFACTURING CO.,** Carbondale, Penna., U.S.A.  
New York Office: 30 Church St.

## LUCKY STRIKE!

**COORS** U.S.A.  
*Chemical and Laboratory*  
**PORCELAIN**



*A Comparative Test:*

No. 3 Casserole Acid Treatment,  
15 hours at 180° C.—

	Loss Grams
Coors . . . . .	.0000
Royal Berlin . . . . .	.0004

**Crucibles, Dishes, Etc.**

Order now and avoid *Porcelain Troubles*; we know you've had them.

**LYMANS, Limited**  
MONTREAL

ESTABLISHED - 1875

## IMPERIAL BANK OF CANADA

HEAD OFFICE: TORONTO

Capital Paid Up	\$7,000,000
Reserve Fund	7,000,000

Branches in Northern Ontario at

Cobalt, South Porcupine, Elk Lake,  
Cochrane, New Liskeard, North Bay  
and Timmins.

Branches in Provinces of  
Ontario, Quebec, Manitoba, Saskatch-  
ewan, Alberta and British Columbia.

Money Transfers made in all parts of the  
World. Travellers' Letters of Credit, Drafts  
cheques, etc. negotiated.



**UNIFORMITY**

USED THE WORLD OVER

**SATISFACTION**



**Atlas Babbitts**



MADE IN CANADA

AMACOL :: ATLAS TIN TOUGHENED :: ATLAS

**Specially Recommended For Mining Machinery**

These Babbitts are the result of years of experience and have a World-wide reputation for uniformity and reliability.

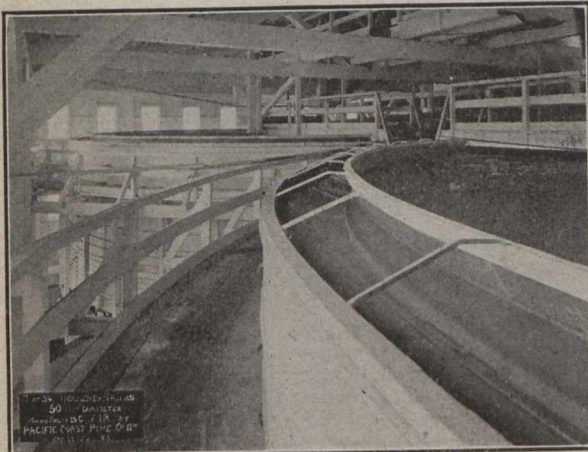
NO SHOCK TOO SEVERE --- NO LOAD TOO HEAVY --- NO SPEED TOO GREAT  
ATLAS METAL & ALLOYS COMPANY OF CANADA, LIMITED, MONTREAL

Sales Agents:

**The Canadian B. K. Morton Co., Limited**

MONTREAL: 49 Common Street.

TORONTO: 86 Richmond Street East.



**Wood Mining Tanks**

Of All Descriptions

**Wood Stave Pipe**

ILLUSTRATION SHOWS DORR THICKENER TANKS 50 FEET DIAMETER. MADE FROM B.C. FIR. INSTALLED BY US.

**Pacific Coast Pipe Co., Limited**

1551 Granville Street, Vancouver, B.C.

**MacKinnon, Holmes & Co., Limited**

SHERBROOKE

Engineers

QUEBEC

Contractors

**MacKinnon Steel Co., Limited**

CANADA

Manufacturers

STRUCTURAL STEEL AND STEEL PLATE WORK OF EVERY DESCRIPTION  
TANKS BUILDINGS TOWERS CHUTES PENSTOCKS  
SMOKESTACKS ORE BUCKETS CARS DRYERS AIR RECEIVERS  
WATER JACKETS HOPPERS BALLOON FLUES SKIPS CYANIDE TANKS

WRITE US FOR PRICES

# The Minerals of Nova Scotia

## THE MINERAL PROVINCE OF EASTERN CANADA

COAL, IRON, COPPER, GOLD, LEAD, SILVER, MANGANESE, GYPSUM, BARYTES, TUNGSTEN, ANTIMONY, GRAPHITE, ARSENIC, MINERAL PIGMENTS, DIATOMACEOUS EARTH.

Nova Scotia possesses extensive areas of mineral lands and offers a great field for those desirous of investment.

**Coal** Over six million tons of coal were produced in the province during 1916, making Nova Scotia by far the leader among the coal producing provinces of the Dominion.

**Iron** The province contains numerous districts in which occur various varieties of iron ore, practically at tide water and in touch with vast bodies of fluxes. Deposits of particularly high grade manganese ore occur at a number of different locations.

**Gold** Marked development has taken place in this industry the past several years. The gold fields of the province cover an area approximately 3,500 square miles. The gold is free milling and is from 870 to 970 fine.

**Gypsum** Enormous beds of gypsum of a very pure quality and frequently 100 feet thickness, are situated at the water's edge.

High grade cement making materials have been discovered in favorable situations for shipping.

Government core-drills can be had from the department for boring operations.

The available streams of Nova Scotia can supply at least 500,000 h.p. for industrial purposes.

Prospecting and Mining Rights are granted direct from the Crown on very favorable terms.

Copies of the Mining Law, Mines Reports, Maps and Other Literature may be had free on application to

**HON. E. H. ARMSTRONG, - Halifax, N. S.**

*Commissioner of Public Works and Mines*



## PROVINCE OF QUEBEC

### MINES BRANCH

#### Department of Colonization, Mines and Fisheries

*The chief minerals of the Province of Quebec are Asbestos, Chromite, Copper, Iron, Gold, Molybdenite, Phosphate, Mica, Graphite, Ornamental and Building Stone, Clays, etc.*

The Mining Law gives absolute security of Title and is very favourable to the Prospector.

**MINERS' CERTIFICATES.** First of all, obtain a miner's certificate, from the Department in Quebec or from the nearest agent. The price of this certificate is \$10.00, and it is valid until the first of January following. This certificate gives the right to prospect on public lands and on private lands, on which the mineral rights belong to the Crown.

The holder of the certificate may stake mining claims to the extent of 200 acres.

**WORKING CONDITIONS.** During the first six months following the staking of the claim, work on it must be performed to the extent of at least twenty-five days of eight hours.

**SIX MONTHS AFTER STAKING.** At the expiration of six months from date of the staking, the prospector, to retain his rights, must take out a mining license.

**MINING LICENSE.** The mining license may cover 40 to 200 acres in unsurveyed territory. The price of this license is Fifty Cents an acre per year, and a fee of \$10.00 on issue. It is valid for one year and is renewable on the same terms, on producing an affidavit that during the year work has been performed to the extent of at least twenty-five days labour on each forty acres.

**MINING CONCESSION.** Notwithstanding the above, a mining concession may be acquired at any time at the rate of \$5 an acre for SUPERIOR METALS, and \$3 an acre for INFERIOR MINERALS.

The attention of prospectors is specially called to the territory in the North-Western part of the Province of Quebec, north of the height of land, where important mineralized belts are known to exist.

**PROVINCIAL LABORATORY.** Special arrangements have been made with POLYTECHNIC SCHOOL of LAVAL UNIVERSITY, 228 ST. DENIS STREET, MONTREAL, for the determination, assays and analysis of minerals at very reduced rates for the benefit of miners and prospectors in the Province of Quebec. The well equipped laboratories of this institution and its trained chemists ensure results of undoubted integrity and reliability.

The Bureau of Mines at Quebec will give all the information desired in connection with the mines and mineral resources of the Province, on application addressed to

**HONOURABLE HONORÉ MERCIER,**

MINISTER OF COLONIZATION, MINES AND FISHERIES, QUEBEC.

# The Flotation Process

All patent and other rights to this process  
in North America are now controlled by

## Minerals Separation North American Corporation

who is the registered owner of the following Canadian patents: Nos. 76,621; 87,700; 94,332; 94,516; 94,718; 96,182; 96,183; 99,743; 127,397; 129,819; 129,820; 134,271; 135,089; 137,404; 142,607; 147,431; 147,432; 148,275; 151,479; 151,480; 151,619; 151,810; 157,488; 157,603; 157,604; 160,692; 160,693; 160,694; 160,846; 160,847; 160,848; 160,849; 160,850; 160,937; 163,587; 163,608; 163,707; 163,936; 165,390; 166,415; 167,474; 167,475; 167,476; 167,603.

On December 11, 1916, the SUPREME COURT OF THE UNITED STATES adjudged our basic patent for air-froth flotation to be valid, holding that this patent covers any process of froth flotation wherein the results obtained are such results as are secured by the use of a fraction of one per cent., on the ore, of an oily frothing agent in an ore-pulp, with agitation. Three of the thirteen claims which specified the use of "a small quantity of oil" and which the Court held to be invalid have since, by proper disclaimer, been brought within the scope of the Supreme Court's decision and, at a recent trial in the United States District Court at Butte, Montana, Judge Bourquin admitted these claims as amended.

On May 24, 1917, the UNITED STATES CIRCUIT COURT OF APPEALS at Philadelphia, in the case of Minerals Separation, Ltd., against Miami Copper Company, unanimously sustained the validity and broadly construed a second basic patent, owned by us, for the use of all "Soluble Frothing Agents." In the same opinion, the Court also validated a third patent for the use of cresols and phenols in the cold and without acid. The defendants, Miami Copper Company, endeavored to avoid infringement of these patents by using Callow pneumatic cells, but the Court held that the operations of the defendant company infringed all three patents.

Prospective users of our flotation processes are earnestly requested not to be misled by the mistaken views disseminated by interested parties that any of these BASIC PROCESS PATENTS can be evaded by a mere variation of apparatus for agitating and aerating the pulp, or by the simple addition of oils or other materials in excess of a fraction of one per cent. on the weight of the ore treated.

### NOTICE

Notice is hereby given that we will enforce our patents and stop all infringements, but are prepared to grant licenses for the right to use all or any of our processes to those who wish to use them. To those who infringe or have infringed our patents, notice is given that a settlement for such infringement must precede the granting of licenses for the future use of same.

Notice is further given that no one is authorized to introduce our processes or apparatus into the United States, Canada or Mexico.

All applications should be made direct to

## MINERALS SEPARATION NORTH AMERICAN CORPORATION

Head Office:  
61 Broadway,  
New York, N.Y.

Engineering Office:  
Merchants' Exchange Building  
San Francisco, California

or through

**Messrs. Ridout & Maybee, Patent Solicitors, 59 Yonge St.  
TORONTO, CANADA**

# CANADIAN STEEL FOUNDRIES LIMITED

## STEEL CASTINGS

Up to 100,000 lbs. each

TRANSPORTATION BUILDING  
MONTREAL

# BRITISH COLUMBIA

## The Mineral Province of Western Canada

Has produced Minerals valued as follows: Placer Gold, \$74,620,103; Lode Gold, \$91,350,784; Silver, \$41,358,012; Lead, \$36,415,124; Copper, 114,559,364; Other Metals (Zinc, Iron, etc.), \$7,730,178; Coal and Coke, \$165,829,315; Building Stone, Brick, Cement, etc., \$26,697,835; making its Mineral Production to the end of 1916 show an

### Aggregate Value of \$558,560,715

The substantial progress of the Mining Industry of this Province is strikingly exhibited in the following figures, which show the value of production for successive five-year periods: For all years to 1895, inclusive, \$94,547,241; for five years, 1896-1900, \$57,605,967; for five years, 1901-1905, \$96,509,968; for five years, 1906-1910, \$125,534,474; for five years, 1911-1915, \$142,072,603; for the year 1916, \$42,290,462.

### Production During last ten years, \$284,916,993

Lode-mining has only been in progress for about twenty years, and not 20 per cent. of the Province has been even prospected; 300,000 square miles of unexplored mineral bearing land are open for prospecting.

The Mining Laws of this Province are more liberal and the fees lower than those of any other Province in the Dominion, or any Colony in the British Empire.

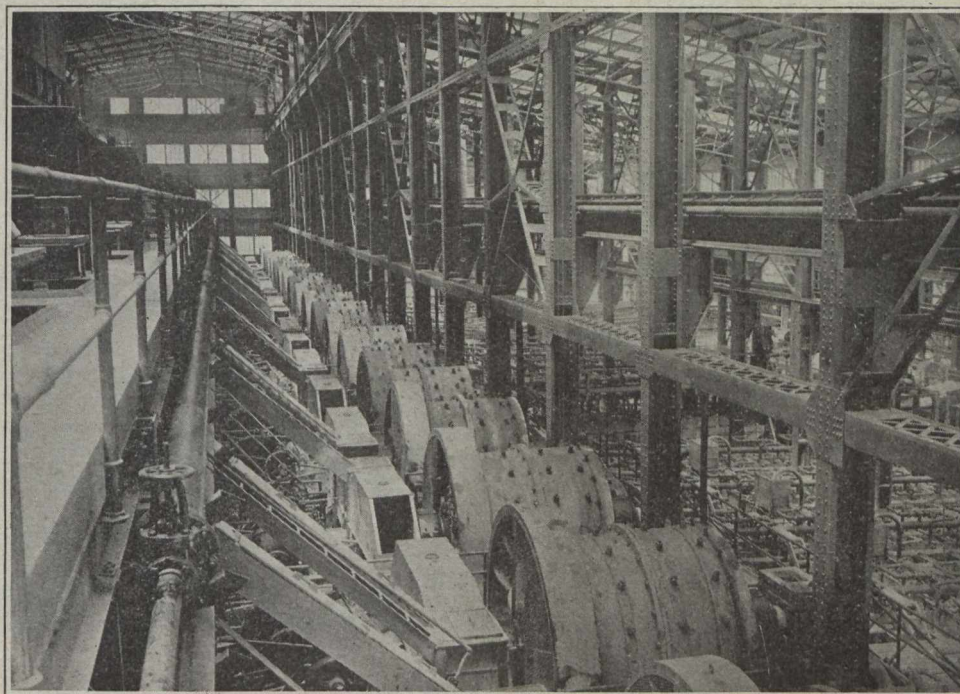
Mineral locations are granted to discoverers for nominal fees.

Absolute Titles are obtained by developing such properties, the security of which is guaranteed by Crown Grants.

Full information, together with mining Reports and Maps, may be obtained gratis by addressing

**THE HON. THE MINISTER OF MINES  
VICTORIA, British Columbia**

# Stage Crushing *vs.* "One Easy Step"



## MARCY MILL

CRUSHING  
"ONE  
EASY  
STEP"

The Marcy Mill carries a heavy flexible mass of graded balls, together with a small amount of ore. Its action on the ore when in closed circuit with a mechanical classifier is that of graded crushing.

In the Marcy Mill fine crushing is done by abrasion and rolling action. Whenever you crush a piece of ore many sizes are produced. The removal of the finished product as fast as made increases the efficiency of the mill. Marcy Mills alone will do this.

The fineness of the product is determined by the mechanical classifier. While Marcy Mills are highly efficient while operating in the tandem arrangement, there are many disadvantages in this method of operation. If you are interested, we can advise you why these disadvantages exist.

We recommend the Marcy Mill and the "One Easy Step" System for three-inch feed and smaller sizes making a product to pass 8, 20, 40, 80 or 100 mesh.

Write and we will give you conservative engineering data pertaining to your problem.

*New Marcy Bulletin Just Off the Press*

## The Mine and Smelter Supply Company

A Service Station within Reach of You

Denver

Salt Lake City

El Paso

New York Office: 42 Broadway

### MARCY MILLS

Are Now Built in Six Sizes

No. 86—Eight feet dia.  
by six feet length.

No. 75—Seven feet dia.  
by five feet length.

No. 64½—Six feet dia.  
by four and one-half  
feet length.

No. 54—Five feet dia.  
by four feet length.

No. 43—Four feet dia.  
by three feet length.

No. 32—Three feet dia.  
by two feet length.

Capacities range from  
ten tons to one thou-  
sand tons daily of fin-  
ished product.

When Ordering Food  
Supplies Include

**KLIM**  
IN POWDER FORM

**IT FILLS YOUR MILK NEEDS**

Klim is pure Ontario milk pasteurized separated and reduced to powder form.

It contains nothing but pure milk-solids—casein, albumen, milk sugar, and milk salts. When dissolved in water it has the natural appearance and taste of fresh liquid milk. The 10 pound tin of Klim makes forty quarts of liquid.

Klim bulks smaller and weighs less than any other form of milk and saves 70% freight charges, because it weighs that much less. It remains good indefinitely. Weather conditions do not affect it. It is the satisfactory, economical milk for camp and private home use.

**Canadian Milk Products Limited**

10-12 St. Patrick St., Toronto  
10 Ste. Sophie Lane, Montreal

Also stocked by:  
W. H. Escott Co., Ltd., Winnipeg, Regina, Calgary,  
Edmonton. Kirkland & Rose, Vancouver

**Mining  
Machinery  
and Supplies**

**Compressors,  
Drills, Pumps,  
etc., etc.**

**NEW AND SECOND HAND**

**MUSSENS LIMITED**

MONTREAL  
WINNIPEG  
VANCOUVER

H. L. Usborne  
COBALT  
H. Turnbull & Co.  
TORONTO

**SUCCESSFUL  
FLOTATION OILS**

**SPECIAL COAL TAR LIGHT OILS (containing high  
percentage of Phenols)**

**Shipments of Drums or Tankcars**

**DOMINION TAR AND CHEMICAL COMPANY  
TAR DISTILLERIES : Sault Ste. Marie, Ont.  
Sydney, Nova Scotia**

Address all communications to Sales Office, Sault Ste. Marie, Ontario.

# THE CANADIAN MINING JOURNAL

VOL. XXXIX

TORONTO, May 15th, 1918.

No. 10

## The Canadian Mining Journal

With which is incorporated the  
"CANADIAN MINING REVIEW"

Devoted to Mining, Metallurgy and Allied Industries in Canada.

Published 1st and 15th of each month by the  
**MINES PUBLISHING CO., LIMITED**

Head Office . . . . . 263-5 Adelaide Street, West, Toronto  
Branch Office . . . . . 600 Read Bldg., Montreal

Editor: REGINALD E. HORE, B.A. (Toronto).

### SUBSCRIPTIONS.

Payable in advance, \$2.00 a year of 24 numbers, including postage in Canada. In all other countries, including postage, \$3.00 a year.

Single copies of current issue, 15 cents. Single copies of other than current issue, 25 cents.

The Mines Publishing Co. aims to serve the mining industry of Canada by publication of reliable news and technical articles. This company publishes the Canadian Mining Journal twice a month and the Canadian Mining Manual once a year.

### ADVERTISING COPY.

Advertising copy should reach the Toronto Office by the 8th for issues of the 15th of each month, and by the 23rd for the issues of the first of the following month. If proof is required, the copy should be sent so that the accepted proof will reach the Toronto Office by the above dates.

### ADVERTISING.

The Canadian Mining Journal covers the Canadian mining field. Ask for advertising rates.

### CIRCULATION.

"Entered as second-class matter April 23rd, 1908, at the post office at Buffalo N.Y., under the Act of Congress of March 3rd, 1879."

## CONTENTS, MAY 15.

	Page.
Editorials—	
The Gold Mining Industry and the War . . . . .	165
Shortage of Labor in Nova Scotia Mines . . . . .	166
Why Coal is Imported into Western Canada . . . . .	166
The Gold Industry and Gold Standard, by Hennen Jennings . . . . .	167
Gold Production in French Colonies . . . . .	173
Toronto's New Electric Steel Plant . . . . .	174
Carbocoal, by C. T. Malcolmson . . . . .	174
Obituary—John McMartin . . . . .	175
Personal and General . . . . .	175
Special Correspondence . . . . .	176
Markets . . . . .	180

Coal mine operators are beginning to realize that coal has been selling too cheaply. This is a good thing for both mining company shareholders and employees, for so long as the product sells at prices that have ruled during the last decade there will be very little profit in the business and great difficulty in increasing wages of employees. If, in the future, coal is sold at a reasonable price, the wages of coal miners will undoubtedly be higher. At the same time shareholders will have some chance of obtaining a fair return on the money invested.

Nova Scotia is consuming much larger quantities of coal than usual and producing less. Consequently there is little coal available for Quebec; but there seems to be difficulty in obtaining transportation for what can be shipped.

## THE GOLD MINING INDUSTRY AND THE WAR.

In this issue we publish an article on gold by Mr. Hennen Jennings, consulting engineer of the U. S. Bureau of Mines. Everyone employed in the gold-mining industry should read Mr. Jennings' article, for it will help them to realize that, in adding to our gold supply, they are doing very necessary work during the war.

It has been argued by some that the mining of precious metals during the war is an unnecessary waste of labor. Such a distinguished economist as Prof. Adam Shortt, in the first year of the war, made a good argument in favor of restriction of gold output. Then, when the United States entered the war, there was some discussion of this subject in the technical press. The arguments are well replied to by Mr. Jennings, an acknowledged authority on gold, who points out that gold will continue as the standard only if it is kept alive by continual new supplies. That it is to the interest of the Allies to maintain the gold standard is obvious, when we remember that nine-tenths of the production is controlled by the Allies. Increased gold production during the war will benefit the Allied countries, and it would be folly to devalue a standard of exchange that is so favorable to us.

Unfortunately, it is true that a period of high prices is not the most favorable time to mine gold. While the product sells at the same price as in periods of low prices, the cost of production is very much higher. Owners of gold deposits have had good reason to consider whether they would not profit more by closing down until conditions become normal again. If they had only themselves to consider, it is not improbable that many directors would be in favor of closing down during the war. Some of them would doubtless believe that in doing so they were not only conserving their ore until they could mine it more cheaply, but that they were actually helping their country by releasing labor. They probably have not seriously considered what it would mean if the Allied countries were to severely decrease their output of gold and so discredit the gold standard. We can scarcely expect that, as individuals, they would worry very much about it. They doubtless expect, and they have a right to expect, Government action in such matters.

Gold mine operators are, of course, finding it impossible to make normal profits during the war. If it were realized that gold production at this time is especially necessary, possibly some encouragement might be given the industry. Is it to be expected that a great effort will be made to increase production of gold in the face of increased costs, if there is no proper recognition of the fact that such increase benefits the country more than it does the mine owners?

Encouragement to gold mining companies at this time should not be withheld. Our Governments would do well to consider whether it is good policy to tax an industry of this nature during the war on the same basis as industries which are benefited by the war. Those who are making large profits from the industry expect to be taxed, but it should be recognized that there are no war profits in gold mining.

### THE SHORTAGE OF LABOR IN NOVA SCOTIA MINES.

Last July, coal mine operators of Nova Scotia submitted to the Fuel Controllers an estimate of 5,950,000 tons as the probable output of Nova Scotia coal mines in 1917. The production was 290,000 tons less than estimated. Increasing scarcity of labor and two disastrous mine explosions were the chief reasons for the failure to make the estimated output.

The coal operators now estimate that with their present supply of labor the mines should produce 5,430,000 tons in 1918 or 230,000 tons less than the unsatisfactory total of 1917. As, however, there will be further calls on the younger men as a result of the Amendments to the Military Service Act, it is probable that the labor supply will be even worse than at present and that consequently the production will be even less than estimated.

According to the operators, there is little reason to hope for many additions to the forces in the mines as there is no known source in Canada from which they might be obtained. Since this is the case, there seems to be especial need of increasing the tonnage per man employed. The operators suggest that an appeal should be made to the workmen to do more than the customary amount of work because of the pressing national necessity. They have suggested to the government that Mr. J. C. Watters should visit the mining centres and take up this matter with the miners as being one of great national importance.

It is reasonable to expect that an appeal to the workmen would have a good effect. The coal miners have, as a class, proven very ready to fight the nation's battles at the front and those at home may be depended on to do their part if the need for extra exertion is understood by them. There must, of course, be adequate compensation for extra work. It is up to the operators to do everything possible to increase the number of tons per man without increasing the consumption of human energy. It is also obvious that if coal mining is so important as we believe it to be, coal miners should receive better wages than they have in the past.

### GEOLOGICAL REPORT ON METACHEWAN GOLD AREA.

There will soon be published by the Ontario Bureau of Mines a report, by A. G. Burrows, on the Metachevan area, in which important gold discoveries were made last year. Four townships are covered by the report. The Otisse claim in Powell township is to be thoroughly tested this summer and the surrounding country will likely be the scene of considerable activity. Mr. Burrows' map and report will, therefore, be of immediate value to prospectors.

#### HOLLINGER.

Mr. A. F. Brigham, recently appointed manager of Hollinger Gold Mines, Ltd., has taken up his new work at the mines. He succeeds Mr. P. A. Robbins, who was some time ago elected managing director for the company. Mr. Brigham comes from the Transvaal.

### Why Coal is Imported Into Western Canada

In the discussions of a paper at the annual meeting of the Canadian Mining Institute, Mr. G. G. S. Lindsay said, in part:

"Why is this large quantity of bituminous coal imported from the United States? Because it pays the railways to so direct it. The empty car movement from the head of the Great Lakes is westward. The full car movement to the head of the Great Lakes is eastward, and everybody who has had any experience in practical mining and in the handling of coal in Western Canada knows that the difficulties in connection with the marketing problem are those of transportation, namely, adverse freights and shortage of cars. In other words, the question is one of replacement. What produce or goods can the railways carry westward in the place of the imported bituminous coal? I would urge on those who seem to have this problem so much at heart that they should consider it from that standpoint. There are a very great many kinds of coal in the Canadian West. They range from inferior lignite in Saskatchewan to the very highest grade of bituminous coal obtainable in America, and the grade improves steadily as you approach the summit of the Rocky Mountains. In Saskatchewan, the coal is of the poorest grade, while that mined at the summit of the Rocky Mountains. In Saskatchewan, the coal is of the ably with the very best coal that obtains in the bituminous field of this Continent. These coals will stand transportation, and they make very little slack; what slack they do make can very profitably be converted into coke, and there is a market for every ton of such coke. Why, then, do we bring coal to the prairie provinces from the United States, when in our own country we have a better coal that we might deliver to that Canadian market at a lesser cost? The freight rate from the summit of the Rocky Mountains to Winnipeg is \$4.50, and with the price of coal at \$3, it could be laid down in Winnipeg for \$7.50; and at intervening Saskatchewan and Manitoba points at less prices, depending on freight rates, and this, moreover, is a better coal than can be obtained from the United States for the same money. Why, then, is not that market open to Canadian producers? The answer is, because it has not suited the railways to favor it for the reason already mentioned that the empty car movement is westward and the full car movement is eastward. As to the proposal to briquette the inferior lignite coal of Saskatchewan to replace what represents a comparatively small proportion of imported anthracite, this expedient, it seems to me, is needless if, as I have suggested, high-class bituminous coals from Western Canada are made available in the market referred to at a lesser price than either anthracite or the proposed manufactured fuel.

Dr. W. G. Miller, Provincial Geologist of Ontario, has been asked to represent Canada on the advisory board of the Imperial Mineral Resources Bureau.

#### TUNGSTEN ORE FROM CARIBOO DISTRICT, B.C.

Mr. J. A. Macpherson, of the Cariboo Chisholm-Creek Mining Co., reports that he is operating, in a small way, scheelite deposits in the Cariboo district. The ore will be hand picked. A specimen of the ore may be seen at the office of the Canadian Mining Journal, Toronto.



# The Gold Industry and Gold Standard

By Hennen Jennings.\*

Consulting Engineer of the United States Bureau of Mines.

Gold attracted the attention of primitive man by its color, lustre and indestructibility. The earliest mining and metallurgical operations of which traces remain were those in Egypt that dealt with the ores of gold. From pictorial rock carvings in upper Egypt, as also from Egyptian hieroglyphics, it is found that the search, desire and use of gold extended back some 3,000 to 4,000 years before the Christian era.

## Gold the Trading Counter.

Starting with use as an ornament, gold soon became the trading counter and has been an emblem of value to the human race as far back as history extends. Appreciation of the value of gold has been maintained through the centuries by the difficulties connected with obtaining the metal.

With early primitive methods, only the gold most abundant and easily worked and visible was first sought and this was found principally in alluvial deposits, but as knowledge, mechanical skill and tools and appliances were developed by the human race gold mining was extended to more difficult alluvial, vein, and lode deposits.

Gold, when it became the counter of trade and a measure of possession, was the most eagerly sought of all possessions, and thus it became the pioneer and stimulant in mining, metallurgy and chemistry. The search for this precious metal became so intense that the alchemists sought its transmutation from other metals, which, though they failed to accomplish, won them other knowledge and gave birth to chemistry.

The trading value of gold has been stabilized by history in that no superabundance was ever obtainable and it has always been necessary to expend labor and intelligence to an extent largely commensurate to the bartering value of the gold obtained.

Accurate records do not exist of the actual outputs of gold in early times, but certainly they must have been small from a modern standpoint. Great outputs of gold, as of all other minerals, are a matter of recent times.

It has been officially estimated that the world production of gold since the discovery of America, in 1492, to the end of 1916, a period of 424 years, was \$16,601,641,319. The output since 1894, a period of 23 years, was approximately \$8,500,000,000, or slightly more than 50 per cent. of the total amount mined in 424 years. The average yearly production up to 1894 was \$19,107,644, while, since 1894 to date it has averaged \$369,565,217 per year.

The available gold on hand as gold reserve in 1894 has been estimated at \$3,965,900,000. The loss of gold and its absorption in the arts and manufacture of jewelry accounts for the differences between the amount produced and the amount on hand.

The amount of gold used in the arts has increased since 1894, and of late years it has been between \$50,000,000 and \$100,000,000 a year. Estimating the consumption and loss of gold since 1894 at \$2,000,000,000 the amount of gold at present on hand as gold reserve may be roughly estimated at \$10,500,000,000.

The concentration and portability of this wealth can be appreciated by converting it into tons weight, for the total tonnage of the entire gold reserve of the world

does not amount to over 17,000 tons and it could be easily transported around the world in one of the largest steamships.

Gold, as also silver, has advantages as money counters owing to large value in small volume, ease of transportation, divisibility without loss, beauty, brilliant lustre, great durability, ease with which they can be guarded, and the difficulty of counterfeiting.

The province of the various mints of the world is to give guarantee of the weights and fineness of the gold they coin. The United States dollar contains 23.22 grains of gold and 2.58 grains of alloy, making a total weight of 25.8 grains, or 1.677 grammes, and its fineness is 900. Gold coins of all nations, under normal conditions, are exchangeable on the basis of their fine gold content.

A broad outlook on modern mining and a study of the output curves of metals since the discovery of gold in this country, in 1849; Australia, 1851; and Transvaal, 1886—indicates that big mining is surprisingly modern and that great outputs of other minerals have been pioneered by gold. Until the last few years, gold outputs have shown a parallelism with those of coal, iron and copper; with the growth of railways, and the deposits in our banks. It would seem that the outputs of coal during the last 18 or 20 years; iron, 15 years; copper, 13; and petroleum, 11—were greater in aggregate than the output of these minerals for all previous history.

The mineral outputs of modern times have been possible only by the advances made in invention, engineering, chemistry and business organization. Even so, it would now appear that the gold output of the world has about reached its zenith, and is giving indications of future decline, as shown by the returns for the past ten years, as under:

1908.	\$442,476,900	1913,	\$459,941,100
1909.	454,059,100	1914,	455,705,000
1910.	455,239,100	1915,	468,724,918
1911.	461,939,700	1916,	457,006,045
1912.	466,136,100	1917,	430,000,000 (est.)

The extreme variation of outputs during this period is given in percentages for the pre-war year 1913, and drop of 6 per cent. is seen from the previous year.

The gold production table appended gives the gold returns from all countries of the world from 1912 to 1916, inclusive, with relative percentages for the pre-war year 1913.

The table shows that gold has been mined in about 60 different countries, and in all the continents of the world. It has been found in the oldest rocks and thus in almost all subsequent geological formations. Traces of gold have been proven to exist in sea water, so the distribution of gold is most widely spread, but never in great quantity compared to other metals. Exceptional occurrence and favorable natural and commercial conditions are required for its profitable extraction.

## The Gold Producing Countries.

The relative production of gold from all countries are given in percentages for the pre-war year 1913, and on a war basis they can be classified as, Allies, Central Powers, and Neutrals, with percentages as follows: Allies, 91.3 per cent.; Central Powers, .6 per cent.; Neutrals, 8.1 per cent. Of the Allies, it is seen that Great

**WORLD'S PRODUCTION OF GOLD, 1912 TO 1916, INCLUSIVE.**  
(Compiled from the reports of the Director of the Mint, U.S. Treasury Department.)

	1912	1913	Per Cent.	1914	1915	1916
<b>NORTH AMERICA:</b>						
United States.....	\$93,451,500	\$88,884,400	19.3	\$94,531,800	\$101,035,700	\$92,590,300
Canada.....	12,648,800	16,598,900	3.6	15,925,000	18,977,901	19,234,970
Mexico.....	24,500,000	19,308,800	4.2	19,308,800	6,559,275	7,690,707
Central American States.....	3,030,400	2,721,700	.6	2,293,800	2,970,271	3,517,597
<b>SOUTH AMERICA:</b>						
Argentina.....	107,300	2,600	.0	2,600	.....	6,330
Bolivia and Chile.....	175,000	175,000	.0	175,000	814,418	396,922
Brazil.....	3,570,600	2,254,700	.5	2,698,200	2,424,515	2,424,515
Colombia.....	2,971,700	2,971,700	.6	4,678,600	5,453,148	6,173,867
Ecuador.....	406,500	406,500	.1	406,500	455,674	545,674
Peru.....	492,200	492,300	.1	492,300	1,109,891	1,179,537
Uruguay.....	111,000	29,900	.0	29,900	11,836	11,836
Guiana—						
British.....	879,800	1,353,500	.3	1,126,500	923,892	767,525
Dutch.....	407,300	470,400	.1	503,400	449,054	438,223
French.....	3,050,600	3,050,600	.7	3,050,600	1,959,793	1,959,793
Venezuela.....	623,500	444,800	.1	444,800	1,395,349	1,424,930
<b>EUROPE:</b>						
Austria-Hungary.....	2,043,200	2,179,300	.5	2,179,300	1,392,465	1,392,465
Finland.....	.....	900	.0	900	.....	.....
France.....	1,812,100	2,127,400	.5	2,127,400	1,400,000	1,000,000
Germany.....	78,100	135,600	.0	135,600	.....	.....
Great Britain.....	27,800	17,900	.0	17,900	19,266	19,152
Greece.....	.....	.....	.0	.....	.....	.....
Italy.....	11,000	17,200	.0	31,100	2,295	2,295
Norway.....	.....	.....	.0	.....	.....	.....
Portugal.....	2,300	2,300	.0	2,300	661	661
Russia.....	22,199,000	26,507,800	5.8	28,587,000	26,322,746	26,322,746
Servia.....	251,100	328,000	.1	116,000	.....	.....
Spain.....	.....	.....	.0	.....	.....	.....
Sweden.....	20,300	17,600	.0	17,600	25,323	25,323
Turkey.....	500	500	.0	500	475	.....
<b>AUSTRALIA:</b>						
British New Guinea.....	.....	377,200	.1	377,200	.....	.....
New South Wales.....	3,416,900	3,093,200	.7	2,573,800	2,738,958	2,235,556
Northern Territory.....	110,300	64,500	.0	52,300	20,351	17,281
Queensland.....	7,192,700	5,493,200	1.2	5,134,800	5,161,911	4,447,793
South Australia.....	136,300	135,500	.0	129,200	125,701	86,399
Victoria.....	9,925,200	8,990,800	1.9	8,541,900	6,803,359	5,305,282
Western Australia.....	26,514,900	27,165,700	5.9	25,487,800	25,104,928	21,941,044
New Zealand.....	6,428,100	7,102,700	1.5	3,870,700	8,740,567	6,048,992
Tasmania.....	785,000	690,400	.2	542,500	383,402	326,408
<b>ASIA:</b>						
British India.....	11,055,700	12,178,000	2.6	11,378,400	11,522,457	11,206,509
China.....	3,568,900	3,658,900	.8	3,658,900	2,804,692	2,804,692
Chosen (Korea).....	2,852,600	3,582,500	.8	3,306,700	3,739,477	4,122,351
East Indies—						
British.....	1,352,000	1,352,000	.3	1,352,000	3,100,000	3,100,000
Dutch.....	3,387,100	3,387,100	.7	3,387,100	.....	.....
Federated Malay States.....	.....	282,400	.1	269,100	351,527	327,871
Formosa (Taiwan).....	.....	814,600	.2	814,600	1,143,017	1,001,178
Indo-China.....	74,700	74,700	.0	74,700	43,659	65,620
Japan.....	4,467,000	3,614,400	.8	3,614,400	5,380,066	5,386,066
Siam.....	56,500	56,500	.0	56,500	.....	.....
<b>AFRICA:</b>						
Abyssinia.....	.....	497,200	.1	497,200	.....	.....
Belgian Congo.....	.....	916,600	.2	916,600	1,029,189	1,029,189
Egypt.....	.....	95,100	.0	126,800	144,910	144,910
French Colonies.....	2,044,600	.....	.0	.....	43,414	43,414
French East Africa.....	.....	.....	.0	.....	.....	.....
German East Africa.....	.....	253,200	.1	253,200	1,381,354	.....
Madagascar.....	.....	1,256,200	.3	1,075,900	.....	964,980
Rhodesia.....	14,226,900	14,274,700	3.1	17,423,100	18,915,324	19,232,165
Sudan.....	.....	192,700	.1	242,800	.....	.....
Transvaal, Cape Colony and Natal.....	188,293,100	181,885,500	39.5	173,560,000	188,043,156	192,182,902
West Africa (Nigeria, Gambia, Gold Coast, and Sierra Leone).....	7,286,000	7,955,300	1.7	8,075,100	8,304,551	7,860,079
<b>Total.....</b>	<b>\$466,136,100</b>	<b>\$459,941,100</b>	<b>100.00</b>	<b>\$455,676,600</b>	<b>\$468,724,918</b>	<b>\$457,006,045</b>

NOTE.—The percentages given are based on the 1913 production with normal mining conditions, when the Allies produced 91.3 per cent.; the Central Powers .6 per cent., and the Neutral countries 8.1 per cent.

Britain, with her colonies and dependencies, produced 62.6 per cent.; United States, 19.3 per cent.; and Russia, 5.8 per cent.

The main gold producers of the world rank in order thus: Transvaal, United States, Australasia, Russia, Canada, and Rhodesia.

Australasia's gold output from 1851 to 1903 amounted to approximately \$2,060,000,000. The output in 1903 was about \$87,000,000 and since then production has decreased gradually until in 1916 it amounted to only about \$39,000,000, or 45 per cent. of the production in 1903. There is at present no indication of any large increase of output in the future.

The Canadian gold output was very small in 1891, but mounted rapidly until 1900, when the Yukon placer workings seemed to have reached their maximum; in that year the Canadian fields produced \$28,000,000. Since 1900 there has been a fluctuating downward tendency. The years 1915 and 1916, however, show some increase; the production for 1915 being \$18,977,901

and that for 1916, \$19,234,976. The war conditions are unfavorable for exploitation or search for new discovery. The extent of territory and natural conditions are such, however, as to give hope of future greater outputs.

Russia's gold statistics are open to doubt. It would appear that gold has been worked in the Ural district since 1820 and that in the last 12 or 13 years outputs have varied from \$35,000,000 to \$22,000,000 a year. Some engineers express the belief that Siberia has greater possibilities for future discovery and exploitation of gold, as also of other metals, than all other fields in the world. At present, in view of war and industrial conditions, the prospect of large outputs of gold in the immediate future is uncertain.

Of the South American and Central American fields, Mexico is the most important. The revival of gold mining commenced with a very small output in 1890 and the maximum production was reached in 1911 with an output of \$29,200,000. Owing to the revolution in that

country the output has dropped to \$7,690,707 in 1916, which was a million dollars increase over 1915. When the country is in better political and economical condition there is good ground for hoping for increased returns.

In other sections of Central and South America the outputs have not been large, but there yet remain large stretches of unexploited territory and abandoned properties which may be found profitable to work.

**Gold Mining in the United States.**

The total production of gold in the United States has been given by the Director of the Mint, as under:

From 1792 to 1847 .....	\$ 24,537,000
From 1848 to 1872 .....	1,204,750,000
From 1873 to 1916 .....	2,599,670,200
<b>Total .....</b>	<b>\$3,828,957,200</b>

**THE WITWATERSRAND GOLD MINING INDUSTRY'S PROGRESS.**

Year	Tons Milled	Yield		Working Costs		Dividends lb	Year
		Total lb	Per ton s. d.	Total lb	Per ton s. d.		
1887.....	25,000	81,045	.....	.....	.....	12,976	1887
1888.....	250,000	729,715	.....	.....	.....	109,050	1888
1889.....	575,000	1,300,514	.....	.....	.....	430,666	1889
1890.....	702,825	1,735,491	49 4	1,480,940	42 1½	254,551	1890
1891.....	1,175,465	2,556,328	43 5	2,221,630	37 10	334,698	1891
1892.....	1,921,260	4,297,610	44 7½	3,418,290	35 6	789,320	1892
1893.....	2,215,413	5,187,206	47 0	4,231,848	38 4	955,358	1893
1894.....	2,830,885	6,963,100	49 2	5,435,816	38 4	1,527,284	1894
1895.....	3,456,575	7,840,779	45 4	5,793,927	33 5	2,046,852	1895
1896.....	4,011,697	7,864,341	39 3	6,350,659	31 7	1,513,782	1896
1897.....	5,325,355	10,583,616	39 7	7,876,435	29 6	2,707,181	1897
1898.....	7,331,446	15,141,376	41 3	10,293,138	28 0	4,848,238	1898
1899.....	6,639,355	14,093,363	42 3	11,606,968	.....	2,946,358	1899
1900.....	692,413	2,484,247	.....	2,590,523	.....	.....	1900
1901.....	412,006	1,014,687	49 2½	598,874	.....	415,813	1901
1902.....	3,416,813	7,179,074	42 0	5,057,948	25 9	2,121,126	1902
1903.....	6,105,016	12,146,307	39 8	8,800,805	24 9	3,345,502	1903
1904.....	8,058,295	15,520,329	38 6	11,664,359	24 4	3,855,970	1904
1905.....	11,160,422	19,991,658	35 10	15,237,309	23 6	4,754,349	1905
1906.....	13,571,554	23,615,400	34 6	18,049,431	33 2	5,565,969	1906
1907.....	15,523,229	26,421,837	33 11	19,499,417	20 10	6,922,420	1907
1908.....	18,196,589	28,810,393	31 5	20,273,720	18 0	8,536,773	1908
1909.....	20,543,759	29,900,359	28 11	21,361,891	17 1	9,471,391	1909
1910.....	21,432,541	30,703,912	28 6	19,487,807	17 7	8,876,085	1910
1911.....	23,888,258	33,543,479	27 11	22,127,618	18 0	7,763,086	1911
1912.....	25,486,361	37,182,795	29 0	24,504,700	18 8	7,952,994	1912
1913.....	25,628,432	35,812,605	27 9	22,919,871	17 11	8,194,099	1913
1914.....	25,701,954	34,124,434	26 6	21,943,692	17 1	8,073,436	1914
1915.....	28,314,539	37,264,992	26 3	24,657,659	17 5	7,519,416	1915
1916.....	28,525,252	38,107,099	26 8	25,763,270	18 1	7,095,066	1916
<b>Total.....</b>	<b>313,117,709</b>	<b>lb492,198,901</b>		<b>lb343,248,445</b>		<b>lb119,029,709</b>	

Official Statistics Showing Annual Tonnage Milled, Value of Output, Working Costs and Dividends.

**The Gold Mining Industry of the Transvaal.**

The preceding tabulated statement for the Transvaal is given in full as it is the most complete record of gold mining operation in the world. The yields, working costs and dividends, from 1887 to 1916, a period of 30 years, have been obtained by sworn statements to both Boer and British Governments.

The total output for these 30 years was £492,198,901, or about \$2,300,000,000. The yearly return for 1916, was £38,107,909, or about \$185,000,000, which was 40 per cent of the world's output for that year. The dividends amounted to 24 per cent. for the whole period, but only 18.6 per cent. for the years 1915 and 1916.

There has been a great struggle to lower expenses, which have been reduced from 42 shillings to about 17 shillings per ton. The average yield has been downward, and fell from 49 shillings to 26 shillings. It would seem the Transvaal fields have reached their maximum output and are on the down-grade.

The Rand Gold Mines are greatly favored in the fact that coal is found in close proximity to the gold. Also, native labor has been moderate in its wage demands, and outnumbers the white workers nearly 8 to 1, thus allowing skilled white workers opportunity for generous pay, which they have obtained.

The existence of gold in Rhodesia has been known for many years but material gold returns only started in 1898, and have steadily increased until 1916, when the output amounted to over \$19,000,000. There was a falling off, however, in 1917, of nearly two million dollars. The total production from 1898 to 1917, inclusive, amounted to \$194,672,165. At the present time the output is depressed by labor and supply conditions, and although the territory for mining operations is vast, with still unknown possibilities, there have been no new discoveries of late.

The yield up to 1847 was obtained from the Eastern coast; from 1848 to 1872, largely from the placer mining in the West; and from 1873 to date, by combination of placer and lode mining and recovery of gold from refineries.

Gold dredging in the United States dates only from 1896, and since that date the production of gold has been estimated at \$120,103,117.

In 1916 the greatest amount of placer mining, including dredging, was done in Alaska, where over 60 per cent. of the gold was thus recovered, and in California, where 38 per cent. was recovered.

All of the gold mining corporations of the United States do not make public their yields, costs, or profits, as is the case in the Transvaal. This government does not make demand for such information. Some of the largest and best managed, however, give most complete and generous information, which can be found in the transactions of mining societies, mining journals and handbooks. There would appear to be no reason for secrecy in gold mining returns, as it is the one business in the world that does not face competition in marketing its product.

Lode or quartz mining in the United States and Alaska produces 75 per cent. of their output. For the world, the percentage is much greater. In South Africa practically all the output is from this source, and shafts as deep as 5,000 ft. have been sunk on the Rand to develop the conglomerate deposits.

In the United States, lode mining has been conducted in great variety of formations and deposits varying from narrow veins of banded quartz with high per ton yield, to great irregular masses of low-grade ore. The gold is often associated with tellurium and other minerals. When pay has given out at shallow or moderate depths, explorations to depths of 4,700 feet, or over, have very often been justified.

The treatment of the ores depends upon their richness and association with other minerals, and the processes for recovery mostly in use are the jaw and gyratory crushers, for the larger rocks, followed by stamp mills, ball mills or rolls, for finer crushing, then plate amalgamation, by which in certain ores the greatest gold return is obtained; and concentration by vanners, shaking tables or oil flotation devices. The concentrates are treated by smelters, chlorination or cyanide works. After stamping or amalgamation the whole pulp is often economically treated in bulk by cyanide process.

#### Yields and Costs.

The yields and costs vary in different districts and in different mines in each district. The greatest gold producers have been mines of low or moderate yield per ton, but with great mass occurrence and good conditions for economical working. The best example of such mining is the Homestake Mine in South Dakota, which has been working since 1875, and has produced over \$147,000,000, the ore not averaging over four dollars a ton and costs ranging from 2½ to 3 dollars per ton with dividends \$40,000,000 or 27 per cent. of the output.

The records of the Alaska Treadwell Group of Mines started in 1885, and brought up to June, 1916, showed there had been crushed and treated 26,000,000 tons, yielding \$63,000,000 or \$2.37 per ton, and at a cost of \$1.42 per ton. The workings were extended to a depth of 2,300 feet, some of them were under the sea and the majority of the mines were flooded with water on April 21, 1917, and are now closed.

Lower yields and lower costs have been obtained by the Alaska Juneau Company and the Alaska Gold Mines which are only a few miles distant from the Alaska Treadwell Mines. Working on a large scale has only been started at these mines recently. In 1916 the Alaska Gold Mines crushed nearly 2,000,000 tons, giving a yield of 97 cents and at reported costs of 73 cents. The Alaska Juneau's large mill has only recently been put into operation. It is anticipated their yields and costs will be still lower. These are the lowest yields and costs known in gold mining. Hydro-electric power is used and all natural conditions ideal for cheap working.

#### The Mother Lode.

The Mother Lode in California, on which a 10-stamp mill was started in 1852, has been prospected or worked over an area of 125 miles, and has produced, according to estimates, over \$230,000,000 in gold. At two of the mines, shafts have been sunk to vertical depths over 4,000 feet. Many mines, however, have been abandoned at moderate depths owing to failure to make them pay. The early returns per ton from the Lode were much higher than recently, which do not average over \$4 per ton. Some old abandoned mines have lately been opened up again and by hydro-electric power and better system of mining and management made to yield substantial profit.

A notable case is that of the Plymouth Consolidated Mines, in Amador County, on the Mother Lode, reopened after an idleness of 24 years, liberally equipped by capital and costs reduced to about \$3.00 per ton.

The North Star Mine, in California, is a good illustration of a persistent but narrow vein of quartz, worked under good management, and being made to pay moderate profit for a very long period. The mine was discovered in 1851, and since then to 1917 has produced 1,470,000 tons, yielding \$18,610,000, or an average yield

of \$12.66 per ton. The total dividends have amounted to \$5,137,000 or about 35 per cent. of the yield. The returns for 1916 show a yield of \$10.42 per ton, with costs at \$6.26 per ton.

An example of very rich yield, but with short life, is found in the case of Gold Fields Consolidated Mines, Nevada. Here, within eight or nine years \$50,000,000 have been taken out, but the yield has fallen from 38.50 a ton in 1910 to 7.52 in 1916. The costs must have been moderate on account of the magnitude of the lode.

The Portland Mine, in Colorado, is another rich telluride mine. It has produced over \$40,000,000 with an average yield of \$27 per ton. The dividends, however, have not amounted to over 20 per cent., as a great amount of development, dead work and costly mining and reduction have been necessary.

#### Effect of Present Economic Conditions on Gold

##### Production.

The writer was in California and Montana in December, 1917, where he had an opportunity of discussing with a number of operators, managers, and engineers the effect of the present economic conditions on the future output of gold as also the proposed excess war profits tax.

As labor and supplies go up, so must the cost of win-gold decreased. An index as to the decreasing purchasing power of gold is obtained by noting some of the things gold be increased, and the purchasing power of increases in cost of supplies used in its obtainment, some of which are given in the table below.

The advance in costs of hydro-electric power has been small. The cost of coal and petroleum varies in different localities, but where necessary to use, is a serious advance in cost of operations under power cost.

##### ADVANCE IN COST OF MINING GOLD.

Labor (about) .....	20%
Steel (in California) .....	40 to 280%
Manganese steel (largely used in dredging) .	130%
Explosives .....	75%
Quicksilver .....	93%
Lumber .....	125%
Machinery, etc. ....	75%
Miscellaneous .....	10 to 200%

Some companies with liberal margins between profit and loss can continue to work under present, or even much worse labor and supply conditions, but the excess war profits tax may so operate as to induce them to curtail outputs. Some of the mines working on very small margins are being closed down gradually and others may be kept going for a time by reducing development work and up-keep of plant, and generally marking time while hoping for better future conditions. There has been a fear among operators that through the workings of the Priority Board there may be difficulty in obtaining transportation and other necessities to keep their mines in constant operation.

It is my view that the elimination of all excess profit taxes on gold mining and the encouraging of maximum outputs might in reality bring in greater revenue to the Government than the tax; for larger dividends paid to shareholders would mean greater revenue from individuals.

#### Gold Standard.

Almost all countries of the world have as their financial basis the legal standard of gold. Only a few retain the double standard of gold and silver—Italy alone among the combatants.

Prior to the war, while there was freedom in trade and inter-communication between the different coun-

tries, the prices of various commodities were regulated both from within and without by the operation of the laws of supply, demand, and competition, and stabilized by the intrinsic value of gold.

The debts of the principal belligerents at the time of their entering the war and those contracted since their entrance, as also an estimation of further debts per year, are given in a very rough and approximate manner in the table hereunder. They are sufficiently accurate, however, to illustrate the danger of the world's financial situation.

**DEBTS OF PRINCIPAL BELLIGERENTS.**

Allies:	Pre-War	War	Total to Dec., 1917	Future yearly estimate
Great Britain.....	\$3,500,000,000	\$23,350,000,000	\$26,850,000,000	\$6,700,000,000
France.....	6,346,000,000	11,754,000,000	18,100,000,000	4,400,000,000
Russia.....	4,544,000,000	16,300,000,000	20,844,000,000	5,000,000,000
Italy.....	2,900,000,000	6,300,000,000	9,200,000,000	2,500,000,000
United States.....	1,200,000,000	7,000,000,000	8,200,000,000	14,000,000,000
<b>Total.....</b>	<b>\$18,490,000,000</b>	<b>\$64,704,000,000</b>	<b>\$83,194,000,000</b>	<b>\$32,600,000,000</b>
<b>Central Powers:</b>				
Germany.....	\$5,000,000,000	\$20,650,000,000	\$25,650,000,000	\$6,000,000,000
Austria-Hungary.....	4,000,000,000	12,200,000,000	16,200,000,000	4,000,000,000
Turkey and Bulgaria.....	800,000,000	1,100,000,000	1,900,000,000	350,000,000
<b>Total.....</b>	<b>\$9,800,000,000</b>	<b>\$33,950,000,000</b>	<b>\$43,750,000,000</b>	<b>\$10,350,000,000</b>
<b>Grand Total.....</b>	<b>\$28,290,000,000</b>	<b>\$98,654,000,000</b>	<b>\$126,944,000,000</b>	<b>\$42,950,000,000</b>

The table shows at a glance the great difference between the debts incurred by the Central Powers and those of the Allies. Taking into consideration the number of combatants and the necessary munitions and supplies used by them, is it not evident that the Central Powers are getting far more value for their debts contracted than the Allies?

As regards the stock of gold on hand in the world and the amount held by the United States, used as money and security, the following quotation is given from the Report of the Secretary of the Treasury, the United States, 1917, page 24, viz.:

"The gold monetary stock (coin and bullion used as money) in the United States on November 1, 1917, is estimated at \$3,041,500,000. The increase in the past 10 months has been \$174,500,000; in the past three years \$1,236,500,000; while in the past five years it has been \$1,161,333,000. In five years the portion of the world's gold monetary stock held by the United States has increased from approximately one-fifth to more than one-third."

This indicates that the calculation made previously in this paper of the gold reserve, corresponds closely with the estimate of the Secretary of the Treasury.

Accepting \$10,000,000,000 as the proper gold reserve of the world, it may be calculated that at the beginning of the war the gold reserve was 35 per cent. of the total debts of the belligerents, while at the present time, it is only about 8 per cent.

**Gold Coins are Certificates from Nature of Man's Work.**

When prices of labor and commodities are so advanced that it is not possible for the majority of the gold mines of the world to work at any profit, then labor and supply prices must become lower, or gold becomes automatically demonetized.

Gold coins can be considered storage cells of human energy, as to obtain them labor of hand and brain must be expended; in fact, they are thus charged with human electro-motive force. They are able to give out strong genial currents of trade confidence, circulating and binding trade, and bringing together different industries and peoples in different lands; their value is not founded on the fiat of any one or more legislative bodies of one or more countries that may be experiencing fleeting prosperity, but they are certificates from nature of man's work and accomplishment.

The electro-motive force of the storage battery cells depends not only on the amount of the electricity poured into them, but also its pressure or intensity. In electrical parlance, the rate of flow is known as the amperes and the pressure the volts, while the power, the watts.

In the gold cells filled with human energy, the amperes can be considered the number of workers and the volts the forces and tools placed at the disposal of the workers by discovery, science, and organization. The watts may be considered the labor force stored in the cell of coin.

In the mention of the labor elements poured into the cells, it must be understood that labor should include the work of managers, engineers, metallurgists, chemists, overseers, mechanics, and other skilled laborers, as well as the more unskilled work of drillers, trammers, shovellers, etc.

The electric storage battery of cells can be rendered useless or burnt up by excessive charges of current; they can also dry out and stop working, or be feebly active should there be an insufficient number of cells in the circuit to do the work demanded.

Translating these conditions to the human electro-motive coin cell, the value of gold can be destroyed by its too great abundance and its too great ease of obtainment. History is almost uncanny in showing how visions of super-abundance as seen or painted by owners and miners, have been doomed to disappointment, and how, considering time and averages, nature has demanded full toll in labor for her gold.

**To Cut Off Supply of New Gold would Devitalize Coinage.**

The electric storage cell can dry out and disintegrate unless refreshed with new current. Should the obtainment of new gold cease while drafts on the old coins are vastly increased, the whole storage battery of gold energy may get so out of adjustment as not to do useful work and gold would become demonetized and the accumulated labor energy of centuries past, locked up in old coins, become inert and valueless. Should all gold mining stop or very radically diminish, this would be the result.

As long as this country, or in fact any country, continues to measure values by a gold standard and pledge its credit on this basis, in the long run the cost of obtaining new gold supply must fix its limitations to the rise in wages and commodities. Gold is a sluggish governor and seems at times inoperative, but its plentifulness and cost of obtainment is ever operative, though not the only factor in the rise and fall of prices.

The great value of the gold coins is that they represent past labor achievements and can not be duplicated in the future without equivalent labor effort. Promissory bills or notes, or contingent division of profits made by either governments, banks or individuals, can be made mere scraps of paper almost overnight by war, revolution or commercial failure, but for thousands of

years gold, while showing fluctuation in purchasing power, has ever been valuable.

Our government securities and liberty bonds, pledged on a gold basis, take the place of gold coins only as long as the people in this and foreign countries have faith that the Government can make good its promises. When this is seriously doubted by the many, gold will go to a premium.

The great gold reserves of the past would not be so necessary if the recognition of the fundamental necessity of measuring gold values in units of labor necessary to win it were better recognized and insisted upon by governments that pledge their credit on a gold basis. Safely to lessen gold reserves while upholding the legal gold standard is the great financial problem of the day for this and other countries.

To attempt to adjust the value of the gold coin by changing its weight in fine gold by government fiat, would be to take away all intrinsic merit from the gold standard and result in confusion and utter lack of financial faith and confidence.

The temptation to enlarge obligations and thus reduce gold reserves to an inadequate amount and meet the difficulty by refusing to pay coin for gold pledges, also has great financial dangers.

#### **The Functions of Money.**

The conception and definition of money has been one of the most fruitful subjects of disagreement, argument and books known to man. It would seem, however, that the main functions of money are first, facilitating exchange; second, a means of estimating comparative values of commodities.

The unreality of paper money is forced upon the writer by his study of gold, the happenings of the time and the outlook for the future. Money must in a large measure be based on sentiment and good faith, for money, even including gold, has no intrinsic value except as an incentive or stimulant to future human enterprise, effort and labor. Its stored value vanishes when the mass of the people repudiate it. When faith in it gives out, those that may seize and wish to make new divisions will find only waste paper in the bonds, notes and securities so eagerly desired and coveted.

Money can be converted into reality only by working masses led by efficient officers, and who not only make use of the muscular energy of the masses, but harness into service all the impersonal obedient servitors that discovery, invention, science and engineering have placed at the command of man, and which force far exceeds all the muscular energy of man.

The payers of income tax in 1915 did not amount to more than one-third of one per cent. of the population. The envied rich amount to only a fraction of this number. They may enjoy pride of possession in the paper showings of their bank deposits and lists of securities, also the power it gives, but their absorbing power of that which money can really give to them individually is very small and confined largely to what they and their families can eat, drink and wear. All other possessions they must share or pass on to others.

The rich are merely deflectors, gates or valves in energy currents. The greatest wealth by the individual has been obtained by organizing labor and producing the necessities of the many at the lowest prices and taking small profits per unit, but with the greatest number of units.

As labor in its broader sense has been organized and stimulated to produce a maximum amount of commodities, it provides for its own necessities and comfort as well as that of the few and makes possible a greater

division of such commodities among themselves. Thus, great production is beneficial to the many as much, and in proportion more, than to the few.

The decennial census of 1910 shows that above 93 per cent. of the male population of the United States, over 21 years of age, is occupied in gainful pursuits. A far more difficult problem than the destruction of capital would arise among the workers should the present order of things be suddenly abolished, which would be how a fair, satisfactory, stimulating division of salaries and wages could be arranged and enforced among the workers, so that they would have more leisure and at the same time obtain more wants and necessities.

Any advance in wages of one class of workers must in fairness be followed by proportionate increases in the wages of other classes and as the laborer's wants and requirements for subsistence and comfort are dependable on his fellow-worker, so must the cost of his subsistence increase as his own and other wages are raised. Thus, in the end no material gain can be obtained by labor unless there is some corresponding advance in the output of his work.

The Government at the present time is the greatest employer of labor and purchaser of commodities. The danger of allowing the prices of commodities to rise above the future cost necessary for obtaining gold, it is hoped has been made plain. Certainly the Government should insist on the stoppage of all classes of profiteering, but how is it possible to fix prices of any commodity and make low bids possible unless there is some limit fixed upon wages and salaries?

The war must be won and it will take money as well as men to accomplish it. However, it does not help matters to pledge credit unnecessarily to please or placate either labor or capital, and the more we get for money on a gold basis at the present time the less will be the burden of debts incurred on future generations, which must of necessity be paid by the mass of the people rather than the few.

#### **The Allies Must Uphold the Gold Standard.**

The financial integrity of the country has been pledged on a gold basis. As 90 per cent. of the gold output of the world comes from the Allies' territories, as a war measure it is plain that it is to the advantage of the Allies to uphold the gold standard. For the past 10 years the world's yearly output of gold has been almost stationary, and the present high cost of labor and supplies are acting very seriously against any increased production.

To stop gold mining in a time of financial stress, as has been indicated, would be like closing the doors of a bank when a run is made upon it. It therefore must be evident that it is vital for this and all Allied countries to encourage gold mining as far as possible.

#### **Gold Mining Should be Encouraged.**

Unfortunately but little help can be directly extended to the gold industry, but, as far as possible, encouragement should be given, for while the war may have proved profitable to any other class of industry in the matter of earnings, certainly it has been seriously injurious to the gold industry.

Indirectly, the gold industry, as well as new issues of Government bonds, can be greatly helped by the reduction in prices of all necessary commodities, and this certainly should be seriously, judiciously and fairly taken in hand by the Government.

The war is to be won by the efficiency, harmony and morale of the workers behind the firing lines as much as by the exercise of these qualities by the soldiers at the front. The right conception of what gold, and in fact

money in any form, has the power of doing, or not doing, seems to the writer a matter of most vital concern at the present time. A better understanding of this problem, he believes, would tend to knit together governments, labor and capital and make for efficiency, harmony and happiness.

### Gold Production in French Colonies

There has recently been published by the National Museum of Natural History, Paris, an interesting paper by Prof. A. Lacroix, entitled "Les Gisements de l'or dans les Colonies Francaises." In this paper Prof. Lacroix deals with statistics of production and the modes of occurrence of the metal in the various colonies of France. The statistics cover the production for the years 1902 to 1915, both inclusive. During this period the greatest production was in 1909, when gold to the value of approximately \$4,512,118 was exported from the colonies; the lowest was in 1914 when the value was \$2,732,807.

As Prof. Lacroix points out the French colonies occupy but a modest place as gold producers, but he believes that when the territories which they embrace are properly explored and prospected the output of the metal will be largely increased.

The French colonies may be divided into two great groups: (1) Martinique, Tahiti, etc., largely of volcanic origin and in which conditions for the occurrence of gold are not so good, and (2) those colonies which are made up largely of ancient rocks, Madagascar, French West Africa, Guiana and Indo-China among them furnish the gold production; but in very unequal proportions.

Gold was discovered in Madagascar in 1845. But, fearing the effects on the people of prospecting and working the deposits, the Queen, Ranavalona I, prohibited, under severe penalties, searching for the metal and this decision was strictly maintained until 1886. At the latter date the prohibition was removed and certain mining concessions were granted. French occupation in 1896 gave an impetus to prospecting. The year of greatest gold production since then was 1909 when about \$2,040,000 was exported. In 1913 the output was about \$1,139,000.

In French West Africa the auriferous areas are numerous, but up to the present production has been small. Among the territories in which gold has been found are those of Senegal-Niger, Guiana and the Ivory Coast. In 1915 the gold exported from these colonies amounted to about \$109,500.

Guiana is the largest gold producer of the French colonies. In the period since 1900, the year in which there was the largest export was 1908, when it amounted to \$2,400,000. The discovery of placers in French Guiana dates from 1853.

In all the French colonies the gold that has been worked occurs chiefly, or exclusively, in the native state. An exception is found in a deposit in Annam, Indo-China. This deposit, the Bong-Miu, in crystalline schists is complex. Auriferous pyrite and galena predominate, the latter also carrying some silver, associated with which are blende, mispickel and chalcopyrite. The production of gold and silver from this mine in 1915 had a value of \$68,800.

Prof. Lacroix' paper contains interesting notes on the character of gold deposits in the several colonies

and gives a good summary of his views on the subject of laterization, of which he has made a special study.

W. G. M.

### THE ENEMY MUST NOT BE ALLOWED TO KEEP FUEL AND IRON LANDS.

Mr. D. B. Dowling, President of the Canadian Mining Institute, at the recent meeting in Montreal, pointed out the importance of Germany's conquests of fuel and iron lands. He said, in part:

"Were peace declared without evacuation, the territories now held by Germany are such that France would lose an appreciable amount of coal and probably 85 per cent. of her iron ore. Her manufactures then would be confined to textiles and the non-metallics, and Germany would have the preponderance both in coal and iron over all Western Europe. Britain would have much less coal than Germany, and the demands for economy coincident with a realization of the possibility of its ultimate exhaustion would slow up manufacturing and naval activity in the former country and give Germany a commanding lead in the competition for world trade."

### CANADA'S KHAKI COLLEGE.

The following notes are taken from the London "Graphic," March 16th, 1918.

"More than one Canadian soldier has told me, in answer to the usual question as to after the war plans, 'I think I shall go back to school.' At the Canadian Soldiers' College, Seaford, Sussex, such boys as these, and their older companions, whose ordinary schooling, but not their complete vocational training, was finished long ago, are going back to school, evening after evening, in their spare time of soldiering.

"The president of this wonderful college is the Dean of the Faculty of Applied Science in the University of British Columbia, Major R. W. Brock, M.A., F.G.S., M.I.M.M., F.R.S.C. He has a number of other degrees, mostly American, and he knows all about geology and metallurgy and mining, subjects of great importance in a country still rich in undeveloped resources.

"The department of engineering, with a McGill man, Major Davis, D.S.O., B.A., B.Sc., at its head, includes many subjects useful both in the army and out of it."

The Granby Consolidated Mining, Smelting & Power Co. has begun the construction of a coking and by-product plant at Anyox, B.C. The company has coal lands on Vancouver Island, which are now being developed to produce about 200 tons coal per day by the end of the year.

### ONTARIO FLUORSPAR PRODUCTION INCREASING.

Fluorspar is in good demand in the United States and recent prices in New York quoted in New York are around \$35 per ton for prompt shipments, and \$28 per ton for 1918 contracts.

Fluorspar mining in Ontario has never been a big industry; but considerable shipments are being made from mines near Madoc. Shipments increased from 1,283 tons in 1916 to 4,213 tons in 1917. Production this year is expected to be much larger.

The Wellington and Munro property near Madoc was acquired in February by the Mining Corporation of Canada, which is now operating the property.

## CARBOCOAL\*

An elaborate series of experiments has been conducted during the past 3 years at Irvington, N.J., which has resulted in the perfection of a process for the manufacture of smokeless fuel from high-volatile coals, and for the recovery and refinement of the coal-tar products derived therefrom. These experiments have been financed by Messrs. Blair & Co., of New York, and were conducted under the direction of Charles H. Smith, the inventor of the process.

The low-temperature distillation of coal has interested investigators for many years. Sporadic attempts have been made to solve the mechanical problems, but until the Smith process was developed, they were not carried to conclusions of economic value. The present coal shortage and the increasing demand for smokeless fuels make this subject one of timely interest.

Mr. Smith's experiments have resulted in the production on a commercial scale of:

1. A fuel, called Carbocoal, which, for convenience in handling, is prepared in briquet form.
2. A yield of tar more than double that obtained in the ordinary by-product coking process.
3. Ammonium sulphate in excess of that normally recovered in the ordinary byproduct coking process.
4. Gas, in amount approximately 9,000 cu. ft. per ton of coal carbonized, which is at present used in the process.

The essential features of the Smith process are the two distillations carried on at different temperatures, first of the raw coal and second of the raw briquets. The raw coal, after being crushed, is distilled at a relatively low temperature, 850° to 900° F., and the volatile contents are thereby reduced to the desired point. The result of this first distillation is a large yield of gas and tar, and a product rich in carbon, termed semi-carbocoal. The semi-carbocoal is next mixed with a certain proportion of pitch obtained from the tar produced in the process, and this mixture is briquetted. The briquets are then subjected to an additional distillation at a higher temperature, approximately 1800° F., resulting in the production of carbocoal, the recovery of additional tar and gas, and a substantial yield of ammonium sulphate.

Carbocoal is dense, dustless, clean, uniform in size and quality, and can be readily handled and transported long distances without disintegration. It is grayish black in color, slightly resembling coke, but its density more nearly approaches that of anthracite coal. It is manufactured in briquet form and can be made in any size, from ½ oz. to 5 oz. The larger sizes are better suited to locomotive purposes, and the smaller sizes for domestic use.

Heretofore, devolatilized fuels, such as coke, have not attained the high rates of combustion desired for locomotive, marine and general steam purposes; and their greater displacement has operated against their general use where transportation cost of stowage space has been an important factor. Carbocoal overcomes these objections. It is actually a relatively soft but tough form of carbon, readily attacked by oxygen in combustion; and for this reason, requires much less draft than other high-carbon fuel.

Carbocoal has been tested by the Long Island Railroad; by the Pennsylvania Railroad at its testing plant at Altoona; by the Carolina, Clinchfield & Ohio Railroad; and by the United States Navy.

These tests have demonstrated that the fuel is smokeless; that it will evaporate from 8.5 lb. of water at a combustion rate of 100 lb. per square foot of grate surface per hour, to 12.8 lb. of water at a combustion rate of 27 lb. per square foot of grate surface per hour, from and at 212° F., per pound of fuel fired; and that it requires no greater draft than bituminous coal. A maximum combustion rate of 166 lb. per square foot of grate surface per hour has been reached for a short period.

Carbocoal has been found particularly suitable for the following purposes:

1. Marine and locomotive service, where limited grate area and restricted boiler capacity demand efficient fuel; where smoke is objectionable or dangerous, as in the case of ships in time of war.
2. Stationary boilers, where smoke pollution of the air is offensive and dangerous to health.
3. Domestic uses, including furnaces, stoves, ranges and open grates, where cleanliness is a desirable factor.
4. Kilns, drying and roasting ovens, and all purposes where an intense and uniform heat is desired.
5. In metallurgical furnaces, as a substitute for coke.
6. Gas producers.

### TORONTO'S NEW ELECTRIC STEEL PLANT.

Since the beginning of 1917, there has been built in Toronto a steel plant that is entirely electrical in operation. Ten Heroult furnaces are used and power is obtained from Niagara Falls. The plant was built for British Forgings, Ltd., a company organized to carry out certain work for the Imperial Munitions Board. Several of the furnaces have been in operation for some months remelting scrap steel, which has naturally been produced in Canada in much larger amounts than usual during the war. Some interesting details of the construction of the plant are given in "Iron Age."

Work was begun on the Ashbridge's Bay site, recently reclaimed, in February, 1917. Steel was made in the first furnace on June 16, 1917, and the other furnaces were completed on the following dates: June 26, June 30, July 5, July 7, August 11 (three) and August 16 (two). The consulting engineers were Perin & Marshall, New York. General direction of the plans for the plant were in charge of Col. David Carnegie, of the Munitions Board.

The furnaces are of six-ton's capacity, erected with tilting mechanism on the casting floor level and the furnaces proper on a reinforced concrete charging floor, 12 feet above the casting floor. Electric power consists of three-phase, 25-cycle, 13,200-volt, alternating current, supplied by the Hydro-Electric Power Commission of Ontario. Transformers supply current to the furnaces at 100 volts. Three electrodes, each 17 inches in diameter, are used.

The plant has been making 12-in. ingots and 6-in. shells, all of which are being turned into munitions in Canada. The Hydro-Electric Power Commission had the contract for electrical work; the Toronto Harbor Commissioners for foundation work and the Hamilton Bridge Company for the structural steel.

### BOUNTY FOR IRON IN BRITISH COLUMBIA.

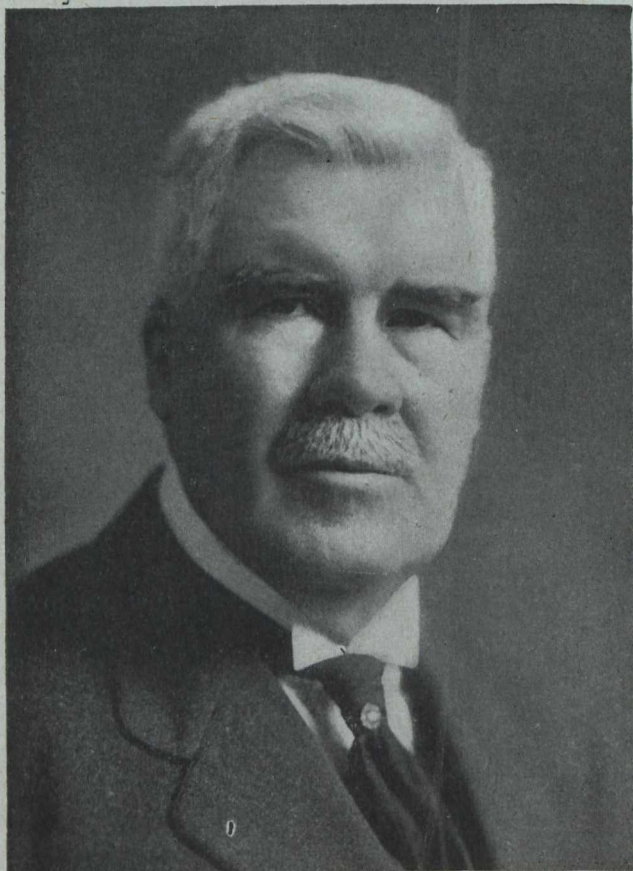
The Government of British Columbia proposes to aid the establishment of an iron and steel industry by offering a bonus of \$3 per ton of pig iron produced from ore mined in the province and \$1.50 per ton made from imported ores.



## OBITUARY.

**John McMartin.**

John McMartin, of Cornwall, Ont., member of the McMartin-Timmins-Dunlop syndicate of La Rose and Hollinger fame, has passed away. Mr. McMartin has been chosen to represent Glengarry in the Dominion Parliament and was in Ottawa for the recent opening of Parliament in spite of failing health. He had hoped to live to play a part in reconstruction after the war in the country in which he had done so much pioneer work.



—British & Colonial Press.

**JOHN McMARTIN**

In 1904, in association with his brother, the late Duncan McMartin, he became interested in the LaRose mine, and later in the Hollinger and other mining interests. He became the vice-president of the Hollinger Mines, vice-president and director of the Canadian Mining Finance Company, Ltd., president of the Princess Realty Company, president of the Labrador Pulp and Lumber Co., president of the Motherlode Sheep Creek Mining Co. of British Columbia, and was officially connected with many other notable Canadian corporations.

About a million and a half from Cobalt was John McMartin's reward. Railway contracting and participation in the Rossland movement had not enriched him. Cobalt, the fortuitous visit to Cornwall when his brother, Duncan McMartin, was endeavoring to procure capital for the LaRose discovery, made the McMartin-Timmins-Dunlop a millionaire quintette—but an unspoiled one, consequently—and reciprocating the generousities—Noah A. Timmins and L. Henry Timmins included the Messrs. McMartin and Dunlop in their Porcupine gold mining ventures—first in importance of their kind on the North American Continent.

## PERSONAL

Mr. W. J. Dick has resigned as mining engineer of the Commission of Conservation, and will be sales manager of Western Coal Mining Company.

Mr. H. Foster Bain has been appointed assistant director of the U.S. Bureau of Mines.

Mr. T. J. Brown, formerly general superintendent for the Nova Scotia Steel and Coal Co., has joined the staff of the Dominion Coal Co.

Samuel W. Cohen has resigned as general manager of the Crown Reserve Mining Company, Limited, and Porcupine-Crown Mines, Limited, which position he has held for ten years, to take up general consulting mining engineering practice with headquarters at Montreal. He remains with both of the above companies as consulting engineer.

Dr. J. M. Bell was in the Cobalt district recently and visited the Keeley mine.

Mr. A. R. Whitman was in Toronto last week, and is now in New York, where he is opening an office at 43 Exchange Place.

Mr. Alex. Sharp has been appointed general manager of the P. Burns Co., Ltd., Coal Mines, Sheep Creek, Alberta.

Mr. S. S. Fowler, general manager for the New Canadian Metal Co., operating the Bluebell mine at Riandel, Kootenay lake, B.C., has been receiving treatment by a specialist in ear troubles in a hospital in San Francisco, California.

Mr. Henry Maluin, head of a French syndicate that for some years has been operating a hydraulic placer-gold property each gravel-washing season, has returned to Atlin district of British Columbia for the current season's work. He spent last winter in the United States, instead of in France as in other winters. His company's gold leases are on Otter Creek, Atlin.

Mr. M. E. Purcell, of the Consolidated Mining and Smelting Co.'s mining staff, is back at Rossland, B.C., from a trip to San Francisco, California, and Portland, Oregon.

Mr. T. M. Daulton, manager of the Placer Mines Co., after spending the winter in Seattle, Washington, is again hydraulicizing on Otter Creek, in Atlin camp, British Columbia, having returned north in April.

Mr. M. S. Davys, for many years engaged in mining in West Kootenay district of British Columbia, first in Nelson mining division, and in later years in the Slocan, has been at Berkeley, near San Francisco, California, for the winter. His latest enterprise was that of equipping the Kaslo concentrator with improved machinery and plant and operating it in treating zinc-lead ore from the Lucky Jim mine, Slocan.

Mr. Melbourne Bailey, manager of the several hydraulic placer-gold properties situated in Cariboo district of British Columbia and known as the John Hopp placer-gold mines, is again at Barkerville, Cariboo, after having been at his home in Tacoma, Washington, for the winter. Supplies for the season have been shipped for Barkerville, and preparations for resuming hydraulicizing were well advanced last month. Mr. Hopp will also be at Barkerville shortly.

The assay office of the Rosebery-Surprise Mining Company at the company's concentrator near Rosebery, Slocan Lake, B.C., has been destroyed by fire.

## SPECIAL CORRESPONDENCE

## BRITISH COLUMBIA.

Announcement has been made that the restriction as to quantity of lead ore that will be received at the Consolidated Mining and Smelting Co.'s smelting works at Trail, West Kootenay, has been removed, and that now all lead ore offering will be accepted. It is stated, though, that the lead recovered will still have to be pooled, as was agreed between the company and Kootenay mine-owners some time ago, under which arrangement only twenty-five per cent. of the value is payable to shippers shortly after receipt of the ore, payment for the remainder being deferred until after the lead shall have been sold by the smelting company.

Little, if any, progress has yet been made in the direction of investigating matters in connection with the alleged unfair treatment of independent mine-owners who have been shipping, or who claim to have been prevented by restrictions imposed by the smelting company from shipping lead-bearing ores to the Consolidated Co.'s works at Trail. It is reported that there has been some delay in providing the requisite financial assistance, and that consequently members of the committee chosen for the work have not been disposed to undertake it until after the indispensable money provision shall have been made. The suggestion has been made that a Royal Commission be appointed instead of the committee of district mining men chosen at a meeting held earlier in the current year at Nelson, B.C., but it is thought that the complaining mine-owners would have little chance of a result in their favor should such a commission carry out the requested investigation, the opinion being that some of the allegations against the smelting company would be found to be not sustained. Meanwhile time is passing and it may be that conditions will adjust themselves to such an extent that the demand for an investigation will not be pressed. Those who are most unfavorably affected by the change in smelting rates and other charges of the last year are the smaller shippers, who have found that under the altered conditions it has not been practicable to continue operating, not at any rate where proceeds of ore mined were required to finance operations.

## EAST KOOTENAY.

Metalliferous mining has shown little change in recent weeks in the several mining divisions of East Kootenay. Against an output from the Sullivan mine in March of 10,101 tons, chiefly of zinc ore, giving an average of 326 tons a day, there was a total of 4,430 tons, or about 316 tons a day, for the first fourteen days of April. Other shippers during the whole of those periods were the Paradise, 525 tons; St. Eugene, 119 tons, and Isaac, 28 tons.

Coal mining in Southeastern Kootenay continues active, with production less than it would be were more miners obtainable. The Crow's Nest Pass Coal Co. is operating mines at both its Coal Creek and Michel collieries, and is making coke at both Fernie and Michel. With smelting works in both West Kootenay and Boundary districts, and at Northport, in the State of Washington, requiring coke, the demand is well maintained, so that a ready market is available for the output of the Crow's Nest Pass Coal Co.'s ovens.

## WEST KOOTENAY.

**Ainsworth.**—Much of the ore that has been shipped from the Bluebell mine at Riondel, across Kootenay lake from the town of Ainsworth has been oxidized lead ore. Last year about 1,000 tons of ore of similar char-

acter was shipped, also to Trail, from this mine.

The Florence Silver Mining Co. is operating its concentrating plant again, not on full time though, but running only one shift daily. The chief producing mine in Ainsworth camp is now the No. 1, owned by the Consolidated Mining and Smelting Co.

**Slocan.**—Not much ore from Slocan mines went to Trail during the first half of April, the only mine appearing on the list having been the Standard with a total of 206 tons. No ore was received from the Lucky Jim zinc mine, which during March shipped 289 tons out of a total from Slocan of 575 tons, which, however, does not represent the total production for that month, ore having also been shipped to smelting works in the United States.

**Nelson.**—Shipment of ore from the Yankee Girl mine has been resumed. This property is situated near Ymir, in the central part of Nelson mining division. Some years ago a comparatively large quantity of ore, containing gold and silver was shipped to Trail and other smelting works, but in more recent years production had been suspended and the development of the mine at a lower level carried out on a scale that resulted in opening much ore. In addition to doing development work, the operators of the mine constructed an aerial tramway from the portal of the lower adit-level to the railway at Ymir, a distance of approximately one mile, thus affording transportation facilities not previously available. The cost of the development of the mine has been provided by the Buchanan syndicate of Fort Worth Texas, which, after the old Yankee Girl company went into liquidation, acquired the property under option of purchase and has since expended much money in developing and equipping it for ore production.

Ore receipts at the Consolidated Co.'s smelting works at Trail from mines in Nelson division, have been small during the current year, the total to April 14 having been less than 1,000 tons. The Consolidated Co.'s Molly Gibson mine, situated in the northeastern part of the division, north of the West Arm of Kootenay Lake, shipped 597 tons of silver-lead ore. This mine is near the head of Kokanee creek, which flows into the West Arm a few miles below Balfour. There is a concentrating plant at the mine. Transportation is by aerial tramway for the greater part of the twelve-mile distance between the mine and the landing on the lake. Another shipper is the Emerald, near Salmo, in the southern part of the division; its product is a lead ore, of which 242 tons had been received at Trail up to the end of the week closed on April 14. The Monarch-Beasley, near the Kootenay river, about nine miles west of Nelson, has this year shipped 84 tons of copper ore. Small shipments from the Salmo region comprise 23 tons of gold ore from the Ore Hill, above Sheep Creek, and 7 tons from the Aspen.

**Trail.**—Ore receipts at the Consolidated Mining and Smelting Co.'s smelting works here totalled 19,604 tons for the first two weeks of April; the proportion from mines operated by the company was 17,459 tons, while the remaining 2,145 tons was of custom ore. More than one-half of this ore was from the company mines in Rossland camp, which shipped 10,066 tons of gold-copper ore. The proportions from other of the company's mines were as follows: Sullivan, in East Kootenay, 4,430 tons of zinc ore; Emma, in Boundary district, 1,621 tons of copper-gold ore; No. 1, in Ainsworth camp, 1,003 tons of silver ore; Molly Gibson, in Nelson mining division, 203 tons of silver-lead ore, and High-

land, in Ainsworth camp, 84 tons of silver-lead ore. Among the custom ore shippers were the Le Roi No. 2 Co.'s Josie mine, in Rossland camp, 959 tons of gold-copper ore; the Bluebell, on the eastern shore of Kootenay lake, 389 tons of lead ore; the Standard, near Slo-can lake, 206 tons of silver-lead ore, and the United, in the State of Washington, 334 tons of copper ore. The total of receipts at Trail in 1918, to April 14, inclusive, was 122,722 tons, of which 107,944 tons was ore from mines operated by the company and 14,778 tons was of custom ore.

#### NORTHERN ONTARIO.

##### Keeley Silver Mine May Be Re-opened.

The re-opening of the Keeley mine in South Lorrain is under consideration. The property was under option to English interests at the time the war broke out, and at that time, owing to the fact that it was expected the war would be of short duration, an extension of time on the option was asked for and granted, giving the holders of the option until one year after the close of the war to complete the terms of their contract. The result has been that the mine has remained in idleness ever since. The Keeley mine was equipped with a powerful mining plant during the years 1908-09, and at one time figured prominently in the affairs of the now defunct Farmers' Bank. A car-load of extremely high-grade ore was shipped, but the values did not prove consistent. A number of large veins carrying smaltite and low silver values are in evidence on the surface and the possibility of the property being operated with success appears to be good. The Keeley adjoins the Wettlaufer, which, along with the Currie property, is being operated by the Pittsburg-Lorrain Syndicate, producing very substantial quantities of silver. In the neighborhood of two million ounces of silver has been produced at the Wettlaufer since the development of the property was first started.

##### Adanac Development Work.

The development work under way at the Adanac Mine, Cobalt, is causing more than ordinary interest, owing to the fact that the drift at the 310-ft. level is nearing the point where the 30-in. vein in evidence on the surface of the property should soon be cut. This calcite vein carries considerable quantities of cobalt. A study has been made of the geological structure of the property by one of the leading geologists of the country and his report is favorable. The drift is in the Keewatin formation. The Keewatin lies like a blanket over the underlying diabase. The shearing already encountered in the drift is approaching the southward slope of the diabase and is very pronounced. Approximately one hundred feet of drifting was done during the month of April, and if the same rate of progress is maintained for the present month, the large vein on the surface should be cut about the last week in May. The work of drifting is costing in the neighborhood of \$18 per foot, which compares well with the best records established in the camp. The company have upwards of 280,000 shares of stock in the treasury, and are financed for the carrying on of operations for the balance of the present year, before which it is anticipated results at the property will place it on a self-sustaining basis.

##### Will Re grind Sands and Cyanide the Slimes.

The Mining Corporation of Canada is making preparations for the treatment of half a million tons of tailings deposited in the bed of Cobalt Lake from the Cobalt Reduction mill. The mill is being altered to permit of the treatment of 300 tons per day

at once and the capacity will eventually be brought up to about 700 tons per day. A pump, with a capacity of about 1,000 tons per day, is being installed to feed the mill and at the same time place a large amount of the tailings close to the mill to permit of operating during the winter months when the lake is frozen. The method of treatment of these old tailings will be that the sand will be pumped to the classifier, the slimes will be treated in the cyanide section of the mill, and the sands after regrinding in the tube mills will be run over the concentrating tables and treated by oil flotation. The work of altering the mill is now under way.

##### Exploring the Waldman Property.

Exploration of the Waldman property of the Mining Corporation of Canada is being aggressively prosecuted. A number of narrow calcite veins have been found, in the conglomerate, but so far these have not been found to carry commercial silver values. Two machines have been employed exploring the conglomerate until the past week, when a third machine was added to expedite the work.

Mr. S. Renaud has optioned the McGregor group of claims in Gillies Limit, a few miles south of Cobalt.

##### Ophir Development Work.

The drift at the 410-ft. level of the Ophir Cobalt property has entered most promising ground, and now the management is sinking a winze from the 410-ft. level to the contact, between the diabase and Keewatin. Another drift running diagonal to the main development drift at the 410-ft. is being run for the purpose of tapping nine veins previously located on the 300-ft. level, some of which are of a very promising character. The management look forward to important results from this development. A comprehensive development programme has been financed at a favorable price.

##### Good Ore Found on Green-Meehan.

Working at a depth of 245 ft. from a winze at the old Green-Meehan property, a wide vein carrying considerable silver, cobalt and nicolite has been encountered. The high-grade streak carries values of upwards of two thousand ounces to the ton, over a width of three inches, while considerable good grade mill rock is in evidence on either side of the vein. In the earlier working of the mine a crosscut had been driven to a point on an upper level where the vein should have been encountered. The present management is understood to have removed a considerable amount of waste rock and debris from this working, with the result that the vein was revealed at precisely the point where it should occur. Here also the values in the vein are said to be of a fairly high grade. The new vein encountered at the 245-ft. depth occurs in a diabase dike close to, and running parallel to, a diabase Keewatin contact. Drifting is proceeding on the new vein.

##### Hopeful for Temiskaming.

The exploration of the Temiskaming Mine is being actively conducted at and above the 500-ft. level as well as at the 1,600-ft. level. On the 300-ft. level, two veins are being followed which are yielding fair returns, and the management is highly optimistic as to the future of the company. Recently, After R. Whitman made an exhaustive study of the property, and while his report has not been made public as yet, his remarks relative to the future outlook for the mine are understood to have been optimistic and present operations are being conducted along the lines of his suggestions.

### Will Develop Molybdenite Property.

A new company is being organized to be known as the Indian Peninsula Mining Company to take over molybdenum ores along the Hurricanaw River, near Amos, Que., on the National Transcontinental Railway. Results already obtained from development work done is spoken of by local engineers in the highest terms, considerable ore bodies being now exposed. A 100-ton mill is to be erected as soon as possible and the treatment of ore commenced. Mr. H. G. Mathewson, banker, Cobalt; Mr. Balmer Neilly, of the Penn-Canadian Mines, and Mr. Frank Groch, of the Groch Centrifugal Flotation, Limited, are interested in the enterprise. Mr. Groch has contracted for the building of the mill.

### Another Good Year for Nipissing.

According to the annual report of the Nipissing Mining Company, 4,212,000 ounces of silver was produced at a cost of 25.117 cents per ounce, and the total receipts were approximately \$3,700,000. The yearly average price at which silver was sold was 83.19 cents per ounce at Cobalt, which was nearly two cents higher than the average New York price for the metal during the year. The known ore reserves show a silver content of about 8,100,000 ounces, or approximately 1,000,000 ounces less than the reserves of December 31st, 1916. However, by reason of the advance in the price of silver, the reserves are estimated at something like \$700,000 more than as of December 31st, 1916. The surplus as of December 31st was \$2,731,000. This is an increase over the previous year of about \$750,000. The stockholders received during the year \$1,800,000, and there has been paid to shareholders since July, 1916, to January, 1918, approximately \$16,750,000. As no large veins were discovered during the past year, the production of nearly 4,000,000 ounces of silver naturally resulted in some decrease in the ore reserves. The underground reserves were decreased about 60,000 ounces; the surface dumps tonnage making up the difference of about a million ounces between the two years. The ore reserves at the present time are estimated to contain 8,076,540 ounces of silver.

### Discovery at Three Star Mine.

An important discovery was recently made at the property of the Three Star Mining Company, Cobalt, formerly the Calumet and Montana Mining Company. The vein is said to be from three to five inches in width and in places to carry high silver values. A crew of over twenty men and three machines are employed in operating the Three Star property.

### Mr. Whitman Goes to New York.

Mr. Alfred R. Whitman has removed his offices from Cobalt to New York. Mr. Whitman has been instrumental in solving many of the geological problems met with in the mining camps of Northern Ontario. With offices in New York, he will not only continue his connections in the north country, but will also extend the scope of his work to other fields. As a geologist, Mr. Whitman has gained for himself an enviable reputation throughout the north country.

### More High-grade Ore at Chambers-Ferland.

The vein recently located at the Chambers-Ferland property of the Aladdin-Cobalt Mining Company continues to yield high grade. At one time, the vein was found to have faulted, but it has since been relocated, and at present continues strong.

### Will Re-open Savage Mine.

The McKinley-Darragh Mining Company has de-

ecided to re-open the Savage section of their property and an aggressive plan of operation will be carried out. It is estimated that there are from eight to ten acres of conglomerate formation on the property which as yet has been unexplored and which is now considered to have good possibilities of being productive. In addition to this new prospective area, a considerable amount of low-grade ore is now in sight. With the increase in the price of silver, it is possible to mine ore of a lower grade profitably now, that three years ago did not pay for the handling.

### 250 Claims Staked in Doherty District.

Already some 250 mining claims have been staked in the Doherty district, about twelve miles south of Temagami. This number of claims comprise about 10,000 acres. Among those interested in the district are a number of Cobalt mining companies, and it is quite evident a large amount of work will be done during the next few months. The geology in the vicinity of Doherty resembles to some extent that of the Cobalt district. Although as yet insufficient work has been done in the district to give any definite opinion as to its future possibilities, the outlook is at least promising.

### Development Work at Genesee Mine.

Development work at the lower workings of the Genesee is being attended with encouraging results. Recently a fault was encountered at the 500-ft. level, in which ruby silver occurred deposited in a fracture along the fault. It would appear that a silver vein is in close proximity to the present point of operations. Further work will be carried on along the fault. Drifting is also proceeding on a promising vein at the 500-ft. level and has been carried for about 36 ft., at which point a stope has been started. The vein in the first round of shots in the stope widened out from about half an inch to one and a half inches in width. The Genesee lies adjacent to the Chambers-Ferland.

### Patricia Mill Should be Ready Soon.

It is expected that the new mill at the Patricia Syndicate property at Boston Creek will be in operation by the end of the present month. The machinery is on the ground and the work of installation is proceeding rapidly. The equipment consists of a Blake crusher, Allis-Chalmers ball mill, a classifier, amalgamating plates and Wilfley tables. The capacity of the mill will be between 50 and 60 tons per day.

Underground developments continue highly satisfactory and the management anticipates no difficulty in keeping the mill up to capacity. With less than seven months between the date of breaking of the first ground and the commencement of production, a new record for mining operations will be established in this country. Mr. Charles O'Connell, formerly manager of the Tough-Oakes is manager and part owner of the Patricia. The property was formerly known as the Boston Hollinger. Development work here is rapidly proving the merits of the Boston Creek camp.

### Will Develop Ontario-Kirkland Property.

Arrangements are being made for the commencement of operations on the property of the Ontario-Kirkland Mining Company, which lies a short distance south from the Wright Hargreaves and with the Hunton and Canadian Kirkland comprise the south auriferous zone of the Kirkland Lake camp. This zone appears to parallel the north or main zone along which is situated the present big producers of the camp. The recent favorable developments on the Canadian Kirkland are attracting interest in that direction and a further big

expansion may be expected. It is reported that the company have made arrangements for the expenditure of \$50,000 in development and the work will begin shortly.

#### **Machinery on Way to Otisse Property.**

The machinery for the development of the Otisse property at Fort Matachewan is well on its way to the property. The diamond drilling equipment is already on the ground and will be in operation in the course of a few days. Most of the heavy machinery for the mining plant has been transported as far as the east branch of the Montreal river from which point it is proposed to move it over the river on floats or barges, after which but a short haul remains to the property. Navigation on the river and lake is now open.

#### **May Re-open Tommy Burns Property.**

It is rumored that Mr. Clarence R. Pope is making arrangements for the re-opening of the Tommy Burns property in Shaw Township, near Porcupine, which has been idle for several months.

#### **Barite Mill at Premier Langmuir.**

It is expected that the mill at the Premier Langmuir Barite property will be in operation early in June. The property is situated in Langmuir township, a few miles south-east from Porcupine. Delay in the delivery of certain parts of the equipment is holding up the commencement of milling operations.

#### **Davidson Mill in Operation.**

A \$9,000 gold bar has been shipped from the Davidson property in the Porcupine camp as the result of the initial run of the new mill, and was the result of the treatment of relatively low grade ore. The mill is steadily increasing its output and the grade of ore now being put through is high. The mill has been so constructed as to permit of increasing the capacity to 100 tons per day with very little difficulty and additional cost. It is expected the management will pursue this course in the near future. The ore body recently developed at the mine has a decided pitch to the south and appears to be an entirely new body, quite independent of the original body that showed on the surface. At least this is the opinion of two mining engineers who have recently examined the property. Should future developments establish this as fact, it will give to the property much greater possibilities.

#### **Elliott Kirkland.**

The shaft at the Elliott Kirkland property has reached a depth of about 480 ft. When the 520-foot is reached a station will be cut and the vein crosscut for at this depth. Owing to results encountered on the Kirkland Lake Gold, which adjoins the Elliott Kirkland, it is anticipated that the vein will show considerable enrichment and further widening out at this point. More than ordinary interest attaches to the development of Elliott Kirkland during the next few months as it will prove the consistence or otherwise of their promising orebody which has been located at the 300-ft. level, and have a definite future bearing on the development of the property.

#### **Schumacher.**

Labor conditions in the Porcupine camp together with the increased cost of supplies has resulted in the curtailing of milling operations at the Schumacher. However, with a return to more normal conditions in either the supply of labor or the cost of materials this company would be in a position to immediately take advantage of this change and their shareholders will eventually reap the rewards of their conservative policy for the development of their properties.

#### **First Clean-up at Lake Shore Plant.**

The results of the first clean-up at the Lake Shore mill at Kirkland Lake has exceeded the most sanguine expectations of the management. Approximately \$40,000 was the result of a twenty-three days' run. The mill is designed for the treatment of 60 tons of ore per day, thus the grade of ore must have averaged approximately \$28 per ton. Costs are being held down to about \$8 per ton of ore treated, and with the grade of ore being treated the profits run in the neighborhood of \$20 per ton or at the rate of \$1,200 per day. This is at the rate of about \$52,170 per month, or an annual output of \$626,240. The estimated net profits on production are equal to \$432,000 annually, which is equivalent to twenty-one per cent. on the par value of the 2,000,000 shares issued capital of the company. The mine is not encumbered with any indebtedness, the sale of treasury stock being sufficient to place the property in its present paying position.

#### **Mining Corporation Makes Second Payment on Rickard Township Claims.**

The Mining Corporation of Canada has made a second payment on the group of claims taken under option last summer in the township of Rickard. Considerable surface and underground work has been done on the property. The main shaft has reached a depth of one hundred feet and lateral work has been under way at this point for some time. A fairly extensive mining plant has been taken in and diamond drilling is under way. A force of about fifty men are engaged and the development of the property is being conducted in an aggressive manner. Success on this property would no doubt be followed by a good deal of exploratory work in the district wherein the rock formations are concealed by a heavy overburden of clay.

#### **Lightning River Claims Will Be Developed.**

Claim owners in the Lightning River district are being given permission to proceed with their development work and a large number are leaving for the district from day to day. The new road has been completed to within a few miles of the discovery group of claims and a small grant of money has been provided by the government to those interested in the district to help complete the work. It is expected that if the district proved up to expectations, further grants of money will be forthcoming for the improvement of the road.

#### **MOLYBDENITE DEPOSITS OF ONTARIO.**

In the recently published 26th annual report of the Ontario Bureau of Mines, Dr. A. L. Parsons describes molybdenite deposits of the province which he visited in May, June and September, 1916. According to Dr. Parsons nearly every molybdenite deposit of commercial importance in eastern Ontario is near the contact of granitic rock and crystalline limestone.

#### **EUXENITE IN ONTARIO.**

A radio-active mineral, euxenite, was discovered in 1915 in a feldspar quarry near Maberly, Lanark Co., Ontario, by J. A. Morrow. Specimens forwarded by Mr. T. W. Gibson, Deputy Minister of Mines, to England, were analyzed by the Imperial Institute. Dr. W. G. Miller and C. W. Knight visited the quarry in June, 1917, and some account of the deposit is given in the recently issued 26th Report of the Bureau of Mines.

**CARELESS CAGER CAUSES HOISTING ACCIDENT AT MOND NICKEL MINE.**

While hoisting a cage containing ten men from the twelfth level, 2,600 ft., of the Mond No. 1 mine at 3 a.m., April 27th, the cable broke at a point about 40 ft. above the cage, when the cage was about 400 ft. above the twelfth level.

The men had all been hoisted from the eleventh level 2,300 ft., and the cager on that level had come to the surface and reported that he had pulled the chairs on that level. The cage in the west compartment was at the twelfth level and the cage in the east compartment, which had just come from the eleventh level, was sent to the twelfth level. The cager had left the chairs in at the eleventh level in the east compartment and the cage stopped at that level, the 300 ft. of cable looping over and dropping down the west compartment. The cage in the west compartment with ten men on was rung up and was hoisted through the coils of cable hanging in this compartment. The cable coiled around the cage and around the dogs until at a point about 100 ft. above the eleventh level the coiled cable became taut and the hoisting cable in the west compartment broke at a point about 40 feet above the cage. The cable coiled around the dogs prevented the safety catches from working, but at the same time acted as a brake between the dogs and the guides, so that the cage did not fall, but slid back slowly to a point about 100 ft. above the eleventh level the coiled cable became taut and held the cage. None of the men in the cage received serious injuries.

The cables were 3,800 ft. long when new, were 1½-inch (8 x 19) plough steel, and had a breaking strain of 67 tons. The hoist is a 400-h.p. electrically driven one. The circuit breaker acted at the same time as the cable broke.

B. Lonyez, the cager, was brought before Magistrate Stoddart at Sudbury on May 6th and sentenced to three months in gaol and a fine of \$50, or an additional one month.

**HAMILTON COMPANY SECURES IRON ORE PROPERTIES IN MICHIGAN AND MINNESOTA.**

The Steel Company of Canada has, in conjunction with other steel companies, secured two iron ore properties, one on the Gogebic and one on the Mesabi range. The ore will be paid for on a royalty basis. Shipments from the Gogebic range mine will be available this year and from the Mesabi late in 1919.

**WILL PRODUCE COKE AT HAMILTON.**

President Robert Hobson, of the Steel Company of Canada, reports that all the contracts for the by-product coke oven plant, to be installed at Hamilton, have been let. It is hoped that production of coke will begin in November. The company's blast furnaces at Hamilton will be supplied.

**INDIAN PENINSULA MINING CO.**

The Indian Peninsula Mining Co. has been formed to operate the molybdenite properties of St. Maurice Mines, Ltd., near Amos, Quebec. Frank Groch and W. E. Simpson of Cobalt are interested in the enterprise.

**HOWE SOUND PAYS DIVIDEND.**

The Howe Sound Co. has announced a dividend of \$99,205. This company is a holding company, controlling the Britannia Mining & Smelting Co., of Howe Sound, B.C.

**GOOD ORE DEVELOPED IN COAST COPPER MINE.**

Encouraging progress is reported to have been made by the Coast Copper Company in connection with the development of its property in Quatsino mining division of Vancouver Island, B.C. Control of the company is held by the Consolidated Mining and Smelting Company. The property consists of a large group of mineral claims, situated between Hardy Bay on the east and Quatsino Sound on the west side of Vancouver Island. Development includes five adits and a shaft, 700 ft. depth having been reached by this work. On both the 500 and the 700 ft. levels about 600 ft. of drifting has been done. Much chalcopyrite ore of good grade has been opened, beside which there is a large body of magnetite in which copper, gold and silver occur.

**TORONTO MARKETS.**

- Cobalt oxide, black, \$1.50 per lb.
- Cobalt oxide, grey, \$1.65 per lb.
- Cobalt metal, \$2.25 per lb.
- Nickel metal, 45 to 50 cents per lb.
- White arsenic, 17 cents per lb.

May 9, 1918—(Quotations from Canada Metal Co., Toronto).

- Spelter, 10 cents per lb.
- Lead, 9 cents per lb.
- Antimony, 16 cents per lb.
- Copper, casting, 28 cents per lb.
- Electrolytic, 28½ cents per lb.
- Ingot brass, yellow, 21 cents; red, 26 cents per lb.

May 9, 1918—(Quotations from Elias Rogers Co., Toronto).

- Coal, anthracite, \$10.00 per ton.
- Coal, bituminous, nominal, \$9.50 per ton.

**SILVER PRICES.**

	New York cents.	London pence.
April—		
22 .....	99¼	49
34 .....	99¾	49¼
25 .....	99¾	49¼
26 .....	99¾	49¼
29 .....	99¾	49¼
30 .....	99¾	49¼
May—		
1 .....	99¾	49¼
2 .....	99½	49¾
3 .....	99½	49¾

**STANDARD MINING EXCHANGE.**

Messrs. J. P. Bickell & Co. report the following closing quotations on the Standard Stock and Mining Exchange at the close of business May 9, 1918:

Gold.	Bid	Ask
Apex .....	.04¾	.05
Dome Extension .....	.10¼	.10½
Dome Lake .....	.19	.20
Dome Mines .....	7.00	7.35
Hollinger .....	4.85	4.93
Imperial .....	..	.01¼
McIntyre .....	1.33	1.34
New Ray .....	.18½	.19
Porcupine Crown .....	.12	.14
Vipond .....	.13	.16
Preston East Dome .....	.02¾	.03

Teck-Hughes .....	..	.48½
West Dome .....	.11¾	.12½
<b>Silver.</b>		
	Bid	Ask
Adanac .....	.10½	.11
Bailey .....	.03½	.04
Buffalo .....	..	1.00
Beaver .....	.26	.27½
Chambers Ferland .....	.11½	.12
Coniagas .....	2.90	..
Crown Reserve .....	.11	.19
Gifford .....	.02	.02½
Great Northern .....	.03	.03½
Hargraves .....	.06¾	.07½
Hudson Bay .....	..	35.00
Kerr Lake .....	..	6.00
Larose .....	.42	.45
McKinley .....	.39	.39¾
Nipissing .....	8.70	9.00
Peterson Lake .....	.09¾	.10
Right of Way .....	.03¾	..
Seneca Superior .....	.01¼	..
Silver Leaf .....	.01¼	..
Temiskaming .....	.29¼	.29½
Wettlaufer .....	.04	.06½
Mining Corporation .....	3.72	..
Provincial .....	.51	.53

No. 12 remelt, 32.30.  
 Sheet 18 ga. and heavier base, 40.20.  
 Powdered aluminum, 65.00 to 70.00.  
 Metallic Magnesium—99% plus \$2.00 to 2.50.  
 Nickel—Shot and ingot, 40.00.  
 Electrolytic, 45.00.  
 Cadmium, nominal, \$1.45—1.50.  
 Palladium, \$115.00.  
 Quicksilver, nominal, \$120.00—125.00.  
 Platinum (pure), \$105.00.  
 10 per cent. Iridium, \$113.00.  
 Cobalt (metallic), 2.50 to 3.50.  
 Tungsten—  
 Scheelite, 24.50.  
 Wolframite, 20.00 to 24.00.  
 Gravel Fluorspar: f.o.b. mines—  
 Prompt, 33.00 to 35.00.  
 Contract, year 1918, 25.00 to 28.00.  
 Silver (official), 99½.

**Metal Products.**—The following quotations represent mill prices and are strictly nominal except in the case of lead sheets and sheet zinc:

Sheet copper—Base prices.  
 Hot rolled, 31.50 to 33.00.  
 Cold rolled, 32.50 to 34.00.  
 Copper bottoms, 39.50 to 41.00.  
 (Shipments from stock 2c per lb. extra).

Copper rods—Base prices.  
 Round, 32.50.  
 Sq. and rectangular, 33.50.

Copper wire—Base prices.  
 Nominal, 26.25—26.75.

Brass Products—Base prices.  
 High brass—  
 Sheets and wire, 26.75 to 27.50.  
 Rods, 24.75—26.75.

Low brass—  
 Sheets and wire, 30.00 to 32.00.  
 Rods, 30.75 to 32.75.

Brazed tubing—  
 Brass, 34.75 to 36.75.  
 Bronze, 39.75 to 41.75.

Seamless tubing—Base prices.  
 Brass, 35.50 to 37.50.  
 Copper, 38.00 to 40.00.  
 Bronze, 42.50 to 43.50.

Full lead sheets, 9.25.  
 Cut lead sheets, 9.50.  
 Sheet zinc, f.o.b. smelter, 15.00.

**NEW YORK MARKETS.**

May 3, 1918.

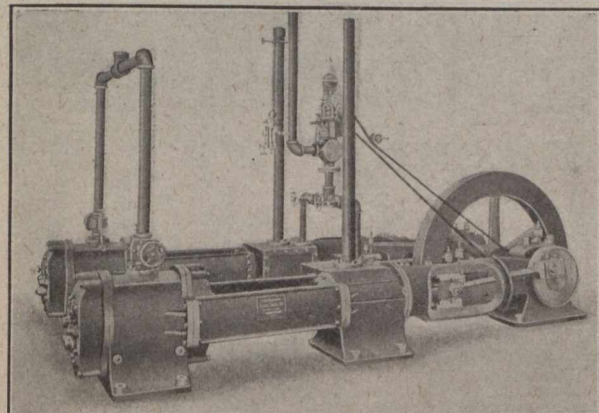
**Connellsville Coke**—  
 Furnace, \*6.00.  
 Foundry, \*7.00.  
 Crushed, over 1-inch:  
 Beehive, \*7.30.  
 \*Fixed under Lever Act.  
 Straits Tin, spot, f.o.b. none offering.

**Copper**—  
 Prime Lake, 23.50.  
 Electrolytic, 23.50.  
 Casting, 23.50.

**Lead**, Trust price, 7.00.  
 Lead, outside, nominal, 7.00 to 7.12½.  
 Spelter, prompt western shipment, 6.95 to 7.00.

**Antimony**—  
 Chinese and Japanese, nominal, 13.00.

**Aluminum**—Government price, carload lots, f.o.b. plant:  
 98-99% Virgin, 32.10.  
 98-99% remelt, 32.10.  
 No. 12 Aluminum Co., 32.30.



# For Sale at a Bargain

## Rand Class "B-1" Air Compressor

Duplex Steam, Duplex Air. Steam Pressure, 80 to 100 pounds.  
 Air Pressure, 80 to 100 pounds. Cylinders 8 inches x 12 inches.

Requires 40 to 46 Steam Horse Power for Full Working Load

Used by us for three or four years giving good satisfaction; but as we now use electric power instead of steam, we have no further use for this machine. Write us for full particulars.

This Compressor cost us \$1,700 New before the war. We are now offering it at considerably less than half this price

**MARSH ENGINEERING WORKS Limited,**  
**BELLEVILLE, ONT.**

## Saddle Tank Locomotives

2—Fifty ton standard gauge **saddle tank Locomotives** first class condition, just out of the shops. Have passed **Hunt's inspection**. Type 0-6-0; Cylinders 18 x 22; Diameter of wheels 58 in; Wheel base 14 ft.

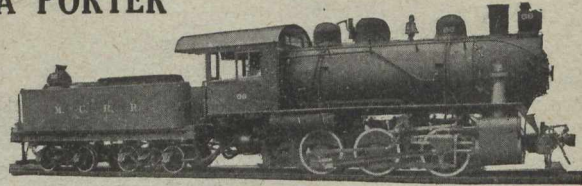
*For immediate shipment*

Also a number of Six Wheel Switchers with tenders, Road Engines and Moguls.

### BURNS & ROBERTS

Bank of Hamilton Bldg., TORONTO

### Reduce Your Haulage Costs With A PORTER



The safety and efficiency of compressed air haulage have been brought to the highest standard in Porter Locomotives. To these we have added an economy in cost and upkeep that no man interested in mine haulage can afford to disregard.

Write for full details to-day.

CANADIAN H. K. PORTER CO, 1218 UNION BLDG., PITTSBURG, PA.

### SPECIAL STANDARD BRONZE (S. S. B.)

#### High Strength Trolley Wire

is unexcelled for durability, reliability and economy. Samples and prices on request.

Standard Underground Cable Co. of Canada, Limited

Hamilton, Ont.

Montreal

Toronto

Seattle

## MINING AND ROCK DRILL STEELS

HOLLOW AND SOLID

OCTAGON    QUARTER OCTAGON    HEXAGON    CRUCIFORM  
PICK                      WEDGE                      HAMMER STEEL

Immediate shipment from Montreal Stock

**Kayser, Ellison & Co., Limited**  
126 Craig Street West, Montreal

Ralph B. Norton, Agent

Works, Sheffield, England

Established 1825

## NATIONAL METAL COMPANY

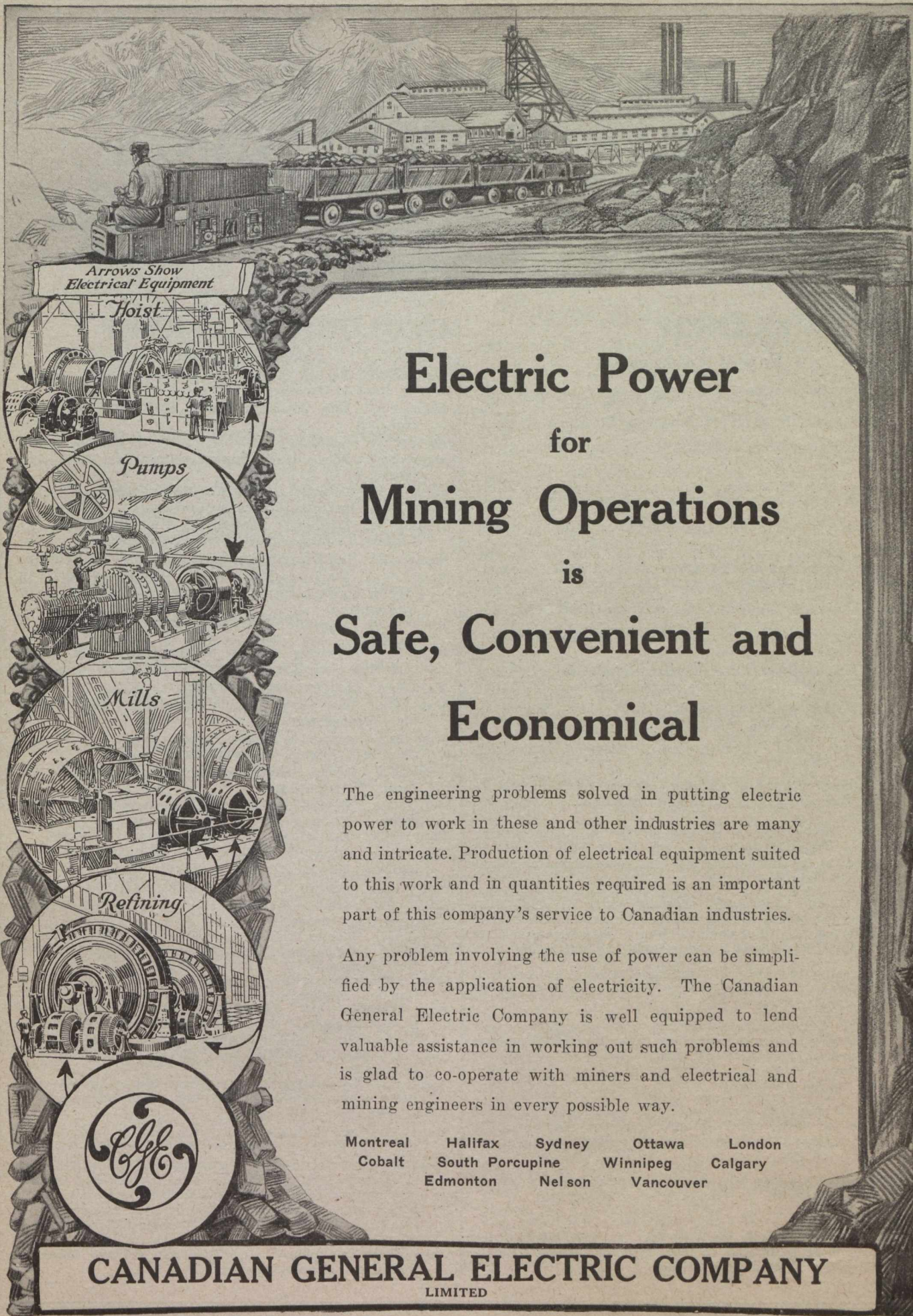
EASTERN AVE., TORONTO

*Manufacturers of*

BABBITS                      SOLDERS                      and                      TYPE METALS  
PIG LEAD    PIG TIN    ANTIMONY    COPPER    SPELTER

FORMULA WORK OUR SPECIALTY





**Electric Power**  
 for  
**Mining Operations**  
 is  
**Safe, Convenient and**  
**Economical**

The engineering problems solved in putting electric power to work in these and other industries are many and intricate. Production of electrical equipment suited to this work and in quantities required is an important part of this company's service to Canadian industries.

Any problem involving the use of power can be simplified by the application of electricity. The Canadian General Electric Company is well equipped to lend valuable assistance in working out such problems and is glad to co-operate with miners and electrical and mining engineers in every possible way.

- |          |                 |          |           |        |
|----------|-----------------|----------|-----------|--------|
| Montreal | Halifax         | Sydney   | Ottawa    | London |
| Cobalt   | South Porcupine | Winnipeg | Calgary   |        |
|          | Edmonton        | Nelson   | Vancouver |        |

**CANADIAN GENERAL ELECTRIC COMPANY**  
 LIMITED

# CANADA

## DEPARTMENT OF MINES

HON. MARTIN BURRELL, Minister.

R. G. McCONNELL, Deputy Minister.

### MINES BRANCH

#### Recent Publications

- Iron Ore Occurrences in Canada, Vol. 1. Compiled by E. Lindeman, M.E., and L. L. Bolton, M.A., B.Sc. Introductory by A. H. A. Robinson, B.A.Sc.
- The Copper Smelting Industry of Canada. Report on, by A. W. G. Wilson, Ph.D.
- Building and Ornamental Stones of Canada (Western Provinces). Vol. IV., by W. A. Parks, Ph.D.
- Feldspar in Canada. Report on, by H. S. de Schmid, M.E.
- Peat, Lignite and Coal; their value as fuels for the production of gas and power in the by-product, recovery producer. Report on, by B. F. Haanel, B.Sc.
- Annual Mineral Production Reports, by J. McLeish, B.A.
- The Coal-fields and Coal Industry of Eastern Canada, by F. W. Gray.
- The Value of Peat Fuel for the Generation of Steam. Bulletin No. 17, by John Blizard, B.Sc.
- Cobalt Alloys with Non-corrosive Properties. Report on, by H. T. Kalmus, B.Sc., Ph.D.
- Mining of Thin Coal Seams of Eastern Canada, by J. F. K. Brown.
- The Mineral Waters of Canada. Vol. I., by John Satterly, M.A., D.Sc., and R. T. Elworthy, B.Sc.

The Mines Branch maintains the following laboratories in which investigations are made with a view to assisting in the development of the general mining industries of Canada:—

**Fuel Testing Laboratory.**—Testing value of Canadian fuels for steam raising and production of power gas; analyses, and other chemical and physical examinations of solid, liquid and gaseous fuels are also made.

**Ore-Dressing Laboratory.**—Testing of Canadian ores and minerals, to ascertain most economical methods of treatment.

**Chemical Laboratory.**—Analysing and assaying of all mineral substances and their manufactured products. Copies of schedules of fees, which are slightly in excess of those charged by private practitioners, may be had on application.

**Ceramic Laboratory.**—Equipment is such that complete physical tests on clays and shale of the Dominion can be made, to determine their value from an economic standpoint.

**Structural Materials Laboratory.**—Experimental work on sands, cements and limes is also undertaken.

Applications for reports and particulars relative to having investigations made in the several laboratories should be addressed to The Director, Mines Branch, Department of Mines, Ottawa.

### GEOLOGICAL SURVEY

#### Recent Publications

- Memoir 92. Part of the District of Lake St. John, Quebec, by John A. Dresser.
- Memoir 93. The Southern Plains of Alberta, by D. B. Dowling.
- Memoir 95. Onaping Map-Area, by W. H. Collins.
- Memoir 96. Sooke and Duncan Map-areas, Vancouver Island, by C. H. Clapp.
- Memoir 97. Scroggie, Barker, Thistle and Kirkman Creeks, Yukon Territory, by D. D. Cairnes.
- Memoir 98. Magnesite Deposits of Grenville District, Argenteuil County, Quebec, by M. E. Wilson.
- Memoir 99. Road material surveys in 1915, by L. Reinecke.
- Memoir 101. Pleistocene and recent deposits in the vicinity of Ottawa, with a description of the soils, by W. A. Johnston.
- Memoir 102. Espanola district, Ontario, by Terence T. Quirke.
- Map 63A. Moncton Sheet, Westmorland and Albert Counties, New Brunswick. Topography.
- Map 154A. Southwestern Yukon.
- Map 157A. East Sooke, Vancouver Island, British Columbia. Topography.
- Map 161A. Beaverton Sheet, Ontario, York and Victoria Counties, Ontario. Topography.
- Map 162A. Sutton Sheet, York and Simcoe Counties, Ontario. Topography.
- Map 163A. Barrie sheet, Simcoe county, Ontario. Topography.
- Map 167A. East Sooke, Vancouver Island. Geology.
- Map 168A. Deposits of stone and gravel available for a highway between Ottawa and Prescott, Ontario.
- Map 1662. Ottawa, Carleton and Ottawa counties.
- Map 1665. Stone available for road material, Hull to Grenville, Quebec.
- Map 1667. Slocan Mining Area, Kootenay District, B.C.
- Map 1677. Coleraine Sheet, Megantic and Wolfe Counties, Quebec.
- Map 1692. Amisk and Athapapuskow lakes, Saskatchewan and Manitoba.
- Maps 1697 and 1698. Explored routes in a belt traversed by the Canadian Northern Ontario railway,—in two sheets: Sheet 1 Gogama to Missonga, Sudbury district; Sheet 2 Oatland to Penhurst, Algoma district, Ontario.
- Applicants for publications not listed above should mention the precise area concerning which information is desired.
- Maps published within recent years may be had, printed on linen, at the nominal cost of ten cents each.
- The Geological Survey will, under certain limitations, give information and advice upon subjects relating to general and economic geology. Mineral and rock specimens, when accompanied by definite statements of localities, will be examined and their nature reported upon.
- Communications should be addressed to The Director, Geological Survey, Ottawa.

## To Users of the Callow Pneumatic Flotation Cell

**U**SERS of the Callow Cell are naturally interested in knowing how the decision of the United States Circuit Court of Appeals for the Third District, in the Miami case, will affect their interests.

As we understand the prevailing opinion of Judge Woolley in the Miami case he has interpreted the Supreme Court decision in the Hyde case as meaning that "*invention resides not alone in the critical proportion of oil, but also in air and agitation,*" and again, "*in the co-action of the critical proportion of oil and air effected by 'an agitation greater than, and different from that which had been resorted to before,' resulting in a froth concentrate of economical value,*" and further, that the Supreme Court did not limit the patent to "*agitation by mechanical means,*" but to agitation of a violent and persistent kind; "*it mixes the oil with the metal of the ore. This is old. Then, by its greater intensity and longer duration, it stirs the pulp into a froth.*"

Thus, this decision of the Third Circuit Court of Appeals has a most important bearing upon the art, because it holds that the mixing of the oil with the mineral is old, but it **leaves open the use of oil in connection with aeration-cells.** Meanwhile the idea of a "*critical*" proportion of oil has been dis-

proved by practice in several mills within a short time after it was promulgated.

Judge Woolley says further, concerning the Callow Cell: "*Aeration is direct, and is not the result of or caused by agitation. On the contrary, agitation results from aeration and such agitation, though present in some measure, is not even approximately of the violence and duration of the agitation of the patent. The operation in the Callow Cell certainly possesses these distinguishing features from operation of the process where aeration is caused by agitation.*"

The Court further confirms this important dictum by saying: "*If the only agitation to which the pulp was subjected (after such agitation as in the prior art was necessary to mix the oil and ore) was the agitation of the Callow Cells, we would not say that that agitation amounted to or was the equivalent of the violent agitation of the patent disclosure and constituted infringement.*"

Apparently users of the Callow Cell may feel assured they do not infringe the method of agitation described in U.S. Patent No. 835,120 (less than 1% oil), No. 962,678 (soluble frothing agents), No. 1,099,699 (phenol or cresol in the cold without acid) since all three of the patents are of the same process, dependent upon a certain degree of violence and length of agitation and the production of the same characteristic froth, as set forth in their claims.

(Signed) J. M. Callow.



*The Babbitt Metal that's at the  
Front in Efficiency and Economy*

## HARRIS HEAVY PRESSURE

**The Aristocrat of Babbitts**

**St. Lawrence Paper Mills Co., Limited**  
Mille Roches, Ont.

The Canada Metal Co., Ltd., Fraser Ave., Toronto, Ont.

Dear Sirs:

We feel like putting in a good word for your Heavy Pressure Babbitt. We installed a very heavy machine some time ago, which had all brass boxes. The shafts weigh six tons each with a top roll weighing four tons, also a lever pressure making a total pressure of about fourteen tons. The brass boxes wore out in four weeks. We then put in Heavy Pressure Babbitt and am pleased to say that we have no more trouble. We put in Heavy Pressure in a very heavy machine eighteen months ago and there seems to be no perceptible wear.

We thank you for supplying us with a babbitt that gives such good results. Yours truly,  
Per C. F. BUSS, Superintendent.

**THE CANADA METAL COMPANY, Limited**

Head Office and Factory **TORONTO**

Branch Factories: **HAMILTON, MONTREAL, WINNIPEG, VANCOUVER.**

# We Buy For Cash

Old Machinery, Metals of all kinds, Shafting  
and Rails

We gather together the various materials and products that have served their purpose in the economic machine and start them over again in new forms through this machine.

Forward us a list of what you have and obtain our prices

**BECAUSE WE BUY FOR CASH WE CAN SELL AT ATTRACTIVE PRICES.**

Shafting, pulleys, hangers, rails, locomotives, boilers, cars, engines, ore breakers, motors, generators, transformers.

*We invite you to test our Service and Prices*

**DOMINION IRON & WRECKING CO., LIMITED**

General Offices : Transportation Building, MONTREAL

**: PROFESSIONAL DIRECTORY :**

**ENGINEERS, METALLURGISTS AND GEOLOGISTS**

**SMITH & DURKEE**  
**Diamond Drilling Co.**  
 LIMITED  
 Contractors for all classes of diamond drill work.  
 We make a specialty of saving a large percentage of core in soft ground.  
 Plans showing location of holes and surveys of holes can be supplied.  
**SUDBURY - ONT.**

*Alfred R. Whitman*  
 Mining Geologist  
 43 Exchange Place, New York

H. J. Griswold, Montreal. B. W. Seton, Toronto  
**Dominion Engineering & Inspection Co.**  
 INSPECTING and TESTING ENGINEERS  
 Inspection and Tests of Materials  
 Supervision of Manufacture  
**MONTREAL**  
 320 Lagachetiere St. West.  
**Toronto**  
 24 Adelaide St. East.  
**Winnipeg**  
 806 Union Trust Bldg.

**THE DORR COMPANY**  
 Hydrometallurgical and Industrial Engineers  
 DENVER NEW YORK LONDON E.C.  
 1009 17th St. 17 Battery Place 16 South St.

**FERRIER, W. F.**  
 Consulting Mining Engineer and Geologist  
 204 LUMSDEN BLDG., TORONTO, ONT.

**ROGERS, JOHN C.**  
 Mining Engineer  
 Examination and Exploration of Mining Properties with a View to Purchase.  
**COPPER CLIFF - ONTARIO**

**ROBERT H. STEWART**  
 Mining & Metallurgical Engineer  
**VANCOUVER BLOCK**  
**VANCOUVER, B.C.**

**MURPHY, CHAS. J.**  
 Min. & Met. Engineer  
 Consultation, Examinations, Reports  
**ST. CATHARINES, - - - ONT.**

**JAMES McEVOY**  
 Mining Engineer and Geologist  
 (Specialty Coal Mining)  
 210 POPLAR PLAINS ROAD, TORONTO, ONTARIO  
 Phone Hillcrest 1461

Phone Main 4427  
**The Toronto Testing Laboratory, Ltd**  
 160 Bay Street, Toronto  
**ASSAYERS & CHEMISTS**  
 "PROMPT AND ACCURATE SERVICE GUARANTEED."

**TYRRELL, J. B.**  
 Mining Engineer,  
 534 Confederation Life Building,  
**TORONTO, - - - CANADA.**

**GEO. R. ROGERS**  
 MINING ENGINEER  
 905 TRADERS BANK BUILDING  
**TORONTO**  
 Examinations, Sampling and Reporting on Mines and Prospects  
 Telephone M. 2625

**A. A. HASSAN**  
 Mining Geologist and Consulting Engineer  
 SUITE 203-204 RIGGS BLDG.,  
**WASHINGTON, D.C.**

**Smith & Travers Diamond Drill Company, Limited**  
 Box 169, SUDBURY, ONT.  
 All classes of Diamond Drilling done.  
 Engineer's Reports on All Work, Furnished.

For information concerning  
**Mining Companies Operating in Canada**  
 consult the  
**Canadian Mining Manual**

Cable Address: "Linsey" Codes: Broomhalls Western Union  
**G. G. S. Lindsey, K.C.**  
 BARRISTER, SOLICITOR, Etc.  
 Bank of Toronto Building - - TORONTO  
 Special attention given to Mining Law  
 Phone Adelaide 1032

**ASSAYERS, CHEMISTS AND ORE TESTERS.**

**MILTON HERSEY CO., LTD.**  
 Chemists and Mining Engineers  
 Assays of Ores Tests of all Materials  
**DR. MILTON L. HERSEY, President**  
 (Consulting Chemist to Quebec Government)  
**JAMES G. ROSS**  
 Consulting Mining Engineer  
**HEAD OFFICE: 84 St. Antoine St., MONTREAL**

Phone M. 1889 Cable address "Heys" Established 1878  
**HEYS, THOS. & SON,**  
 Technical Chemists and Assayers,  
 Rooms M and N, Toronto Arcade  
 Yonge Street. Toronto, Ont.  
 Sampling Ore Deposits a Specialty.

**JOHNSON, MATTHEY & CO. LTD.**  
 Buyers, Smelters, Refiners & Assayers of Gold, Silver, Platinum, Ores, Sweeps, Concentrates, Bullion, &c.  
 Offices—Hatton Garden, London, E.C.  
 Works—Patricroft, Manchester, England

**Canadian Laboratories, Ltd.**  
 ASSAYERS AND CHEMISTS  
 24 Adelaide St. West  
 "WE ANALYSE ANYTHING" TORONTO  
 SPECIAL RATES SEND FOR PRICES PHONE MAIN 5088

**LEDOUX & CO.**  
 ASSAYERS AND SAMPLERS  
 Office and Laboratory,  
 99 John St., New York.  
 Weigh and Sample Shipments at Buyers' Works, representing the Interests of Sellers in all Transactions.  
 We are not Dealers or Refiners.

**CAMPBELL & DEYELL, Limited**  
 Ore Samplers, Assayers  
 Head Office & Works  
 Cobalt, Ontario  
 L. M. CAMPBELL,  
 General Manager.  
 Mechanical selection of samples from shipments of any size and quality

**LAWYERS**

Telephone Main 3813 Cable Address: "Chadwick" Toronto Western Union Code  
**E. M. Chadwick, K.C.** **Fasken, Robertson, Chadwick & Sedgewick**  
 David Fasken, K.C. Barristers, Solicitors, Notaries  
 M. K. Cowan, K.C. Offices: Bank of Toronto, Cor. Wellington & Church Sts.  
 Harper Armstrong, Alexander Fasken, Hugh E. Rose, K.C., Geo. H. Sedgewick, James Aitchison  
 58 Wellington St. East Toronto

J. M. CALLOW  
President

**GENERAL ENGINEERING COMPANY**

E. B. THORNHILL  
Manager

(Canadian Branch)  
CONSULTING ENGINEERS  
363 Sparks St. Ottawa, Ont.

**CALLOW PNEUMATIC SYSTEM OF FLOTATION**  
Complete Laboratory at 363 SPARKS ST., OTTAWA, ONTARIO, for the testing of Gold,  
Silver, Copper, Lead, Zinc, Molybdenum, and Other Ores.  
HEAD OFFICE, - - SALT LAKE CITY, UTAH, (U.S.A.)

VICTOR C. ALDERSON

JOHN M. BAKER

HAMILTON W. BAKER

PAUL W. GAEBELEIN

**ALDERSON, BAKER & GAEBELEIN**

Consulting Mining Engineers

Standard Bank Building,  
Toronto, Ont.

185 Devonshire Street,  
Boston, Mass.

GRADUATE ENGINEER, 27, exempted, surveying railway construction, coal and metal mining experience, desires position, either engineering or operating, where there is no time for idleness. Can handle men; at present employed; least salary, \$150. Apply Box "A," Can. Mining Journal.

**PATENTS**  
TRADE MARKS AND DESIGNS  
PROCURED IN ALL COUNTRIES

Special attention given to Patent Litigation  
Pamphlets sent free on application

**RIDOUT & MAYBEE**

Cor. YONGE AND COLBORNE STS., TORONTO ONT.,

**RAILS**

New or Relaying  
12 to 80 pound per yard

Locomotives,  
Switches, Turntables,  
Dump Cars,  
Portable Track, Etc.

**JNO. J. GARTSHORE**

58 Front St. West - Toronto, Ont

**Hardy Patent  
Pick Handles**

We make a specialty of  
these handles.

And are the only manu-  
facturers in Canada.

Handles of all kinds for Coal Mining.

Write for prices.

**St. Marys Wood Specialty Co., Ltd.**  
St. Marys, Ont.

**FELDSPAR PROPERTY FOR SALE.**

We believe we have the largest  
deposit of high grade Feldspar yet  
discovered in Canada. Not far from  
rail and water communication. For  
description, location, assays and  
price, etc., write to C. A. Phillips,  
Box 346, Parry Sound, Ontario,  
Canada.

**PORCUPINE GOLD CAMP**

Latest information obtained  
by subscribing to the

**PORCUPINE HERALD**

South Porcupine, Ontario  
Canada \$1.50, United States \$2.00 a year.

**Dominion Coal Company**

Limited

Glace Bay

Nova Scotia

19 Collieries

Output—5,000,000 tons annually

“Dominion” Coal

Screened, run of mine and slack

“Springhill” Coal

Screened, run of mine and slack

Collieries at Glace Bay, C.B., and Springhill,  
N.S.

Shipping Ports—Sydney and Louisburg, C.B.,  
and Parrsboro, N.S.

For Prices and Terms Apply to:

**Alexander Dick, General Sales Agent,**

112 St. James Street, Montreal

or at the offices of the Company at

171 Lower Water Street, Halifax, N.S.

and to the following Agents

R. P. & W. F. Starr, St. John, N.B.

Buntain, Bell & Co., Charlottetown, P.E.I.

Hull, Blyth & Co., 1 Lloyds Ave., London, E.C.

Harvey & Co., St. John's, Nfld.

**MINE MACHINERY  
FOR SALE**

**IMMEDIATE DELIVERY**

Two Alley and McLellan Com-  
pressors, 600 feet on 100 lb.  
pressure.

One Rand Compressor, 800 feet  
on 100 lb. pressure.

One Gates Breaker, Style K,  
No. 7 $\frac{1}{2}$  complete, weight 68,100  
pounds.

One Gates Breaker, Style K,  
No. 4 complete, weight 21,800  
pounds.

**DOMINION IRON & WRECKING CO.  
LIMITED**

Transportation Building, - Montreal, Que.

**BUYERS AND SELLERS OF METALS**

**The Consolidated Mining and Smelting Company**

OF CANADA, LIMITED

Smelting and Refining: Trail, British Columbia

BUYERS OF

Gold, Silver, Copper, Lead and Zinc Ores

SELLERS OF

Tadanac Brand Pig Lead—Copper—Zinc  
Electrolytic—Highest Grade

Eastern Sales Office: C.P.R. Building, Toronto

**CAPPER PASS & SON, LTD.**

Bedminster Smelting Works, BRISTOL  
ENGLAND

SELL

Antimonial Lead  
Antimony Alloys  
Tin Alloy

BUY

Ores, Mattes, Residues or Drosses,  
Containing Tin, Copper, Lead or Antimony

For Information Concerning  
Mining Companies Operating in Canada

Consult The  
Canadian Mining Manual

**The Coniagas Reduction Company, Limited.**

St. Catharines, - - - Ontario

Smelters and Refiners of Cobalt Ores

Manufacturers of

Bar Silver, Arsenic—White and Metallic.  
Cobalt Oxide and Metal.  
Nickel, Oxide and Metal.

Telegraphic Address:  
"Coniagas"

Codes: Bedford McNeill,  
A.B.C. 5th Edition

Bell Telephone 603, St. Catharines

**Balbach Smelting and Refining Co.  
Newark, N. J.**

Buyers of

Gold, Silver, Lead and Copper Ores.  
Lead Residues and Copper Residues.

Electrolytic Copper Refinery

INQUIRIES SOLICITED

Oldest Experts in

Molybdenite  
Scheelite

Wolframite

Chrome Ore

Nickel Ore

Cobalt Ore

Cerium, and

all Ores

and

Minerals

**GEO. G. BLACKWELL, SONS & CO., Limited**  
Metallurgists, Mine Owners, Merchants, Manufacturers  
THE ALBANY, LIVERPOOL, ENGLAND

Talc

Mica

Barytes

Graphite

Blende

Corundum

Fluorspar

Feldspar

Largest Buyers, Best Figures, Advances on  
Shipments, Correspondence Solicited

Cables—Blackwell, Liverpool, ABC Code,  
Moreing & Neal Mining and General Code,  
Lieber's Code, and Muller's Code.

ESTABLISHED By GEO. C. BLACKWELL, 1869

**HENRY BATH & SON, Brokers**

London, Liverpool and Swansea

ALL DESCRIPTION METALS, MATTES, Etc.

OF

Warehouses, LIVERPOOL and SWANSEA.

Warrants issued under their Special Act of Parliament.

NITRATE OF SODA. Cable Address, BATHOTA, London

**C. L. CONSTANT CO.,**

42 New Street

New York

SHIPPERS' AGENTS

FOR

Selling, Sampling and Assaying Ores,  
Metals and Furnace Products

Entire charge taken of shipments from the receipt of bill  
of lading to the collection of smelter's return

NOT CONNECTED WITH ANY SMELTER

Canadian Representative:

G. C. BATEMAN

Traders Bank Building, Toronto

**Deloro Smelting and Refining Co., Ltd.**

Manufacturers of

Cobalt Oxide and Metal

Nickel Oxide and Metal

Refined White Arsenic

"STELLITE"

High Speed Tool Metal

Head Office and Works: DELORO, Ont.

Branch Offices: 200 King Street West, Toronto  
315 Craig Street West, Montreal

# CXL EXPLOSIVES

**T**ry our Ammonia Dynamites.

**E**very blaster has difficulties.

**C**all on C.X.L. Technical Division.

**H**ave you tried our Polar Brands.

**N**o. 8 Blasting caps are the best.

**I**f you are in doubt ask—

**C**X.L. trade mark denotes the best.

**A**fter all, the best is none too good.

**L**et us prescribe for your blasting troubles.



## Canadian Explosives Limited

Head Office: MONTREAL, P.Q.

Main Western Office: VICTORIA, B.C.

### DISTRICT OFFICES:

NOVA SCOTIA:	.	.	.	.	.	.	Halifax
QUEBEC:	.	.	.	.	.	.	Montreal
ONTARIO:	Toronto,	Cobalt,	Timmins,	Sudbury,	.	.	Ottawa
MANITOBA:	.	.	.	.	.	.	Winnipeg
ALBERTA:	.	.	.	.	.	.	Edmonton
BRITISH COLUMBIA:	Vancouver,	Victoria,	Nelson,	.	.	.	Prince Rupert

### Factories at

Beloeil, P.Q.	Vaudreuil, P.Q.	Windsor Mills, P.Q.
Waverley, N.S.	James Island, B.C.	Nanaimo, B.C.
Northfield, B.C.	Bowen Island, B.C.	Parry Sound, Ont.



# The Canadian Miners' Buying Directory.

- Air Hoists—**  
Canadian Ingersoll-Rand Co. Ltd., Montreal, Que.
- Amalgamators—**  
Northern Canada Supply Co.
- Antimony—**  
Canada Metal Co., Ltd.
- Assayers and Chemists—**  
Milton L. Hersey Co., Ltd. Campbell & Deyell, Cobalt. Ledoux & Co., 99 John St., New York.  
Thos. Heys & Son.  
C. L. Constant Co.  
Koering Cyaniding Process Company.
- Assayers' and Chemists Supplies—**  
C. L. Berger & Sons, 37 William St., Boston, Mass.  
Lymans, Ltd., Montreal, Que.  
Stanley, W. F. & Co., Ltd.  
Koering Cyaniding Process Company.  
Mine & Smelter Supply Co.
- Babbitt Metals—**  
Canada Metal Co., Ltd.  
Can. B. K. Morton.  
Hoyt Metal Co.
- Balances—Heusser—**  
Mine & Smelter Supply Co.
- Ball Mills—**  
Hull Iron & Steel Foundries, Ltd.  
Mine & Smelter Supply Co.
- Belting—Leather, Rubber and Cotton—**  
Northern Canada Supply Co.  
Jones & Glasco.  
Can. B. K. Morton.
- Blasting Batteries and Supplies—**  
Canadian Ingersoll-Rand Co. Ltd., Montreal, Que.  
Northern Canada Supply Co.  
Canadian Explosives, Ltd.
- Blowers—**  
Northern Canada Supply Co.
- Boilers—**  
Northern Canada Supply Co.  
Canadian Ingersoll-Rand Co. Ltd., Montreal, Que.  
Can. Allis-Chalmers, Ltd.  
Marsh Engineering Works.
- Boxes, Cable Junction—**  
Standard Underground Cable Co. of Canada, Ltd.
- Buckets—**  
Hendrick Mfg. Co.  
M. Beatty & Sons, Ltd.  
Marsh Engineering Works.  
Northern Canada Supply Co.
- Cable—Aerial and Underground—**  
Northern Canada Supply Co.  
Standard Underground Cable Co. of Canada, Ltd.
- Cableways—**  
M. Beatty & Sons, Ltd.  
Can. Allis-Chalmers, Ltd.
- Cages—**  
Northern Canada Supply Co.
- Cables—Wire—**  
Standard Underground Cable Co. of Canada, Ltd.
- Car Dumps—**  
Sullivan Machinery Co.
- Cars—**  
Northern Canada Supply Co.  
MacKinnon, Holmes & Co.  
Marsh Engineering Works.  
Mine & Smelter Supply Co.
- Car Wheels and Axles—**  
Marsh Engineering Works, Ltd.
- Cement Machinery—**  
Northern Canada Supply Co.  
Hull Iron & Steel Foundries, Ltd.  
Can. Allis-Chalmers, Ltd.
- Chains—**  
Jones & Glasco.  
Northern Canada Supply Co.
- Chemical Apparatus—**  
Mine & Smelter Supply Co.
- Chemists—**  
Canadian Laboratories.  
Campbell & Deyell.
- Thos. Heys & Sons.**  
Milton Hersey Co.  
Ledoux & Co.
- Classifiers—**  
Mine & Smelter Supply Co.
- Coal—**  
Dominion Coal Co.  
Nova Scotia Steel & Coal Co.
- Coal Cutters—**  
Sullivan Machinery Co.  
Can. Ingersoll-Rand Co., Ltd.  
Ltd., Montreal, Que.
- Coal Mining Explosives—**  
Canadian Explosives, Ltd.
- Coal Mining Machinery—**  
Canadian Ingersoll-Rand Co. Ltd., Montreal, Que.  
Sullivan Machinery Co.  
Marsh Engineering Works.
- Coal Pick Machines—**  
Sullivan Machinery Co.  
Canadian Ingersoll-Rand Co. Ltd., Montreal, Que.
- Compressors—Air—**  
Escher Wyss & Co.  
Smart-Turner Machine Co.  
Canadian Ingersoll-Rand Co. Ltd., Montreal, Que.  
Northern Canada Supply Co.  
Can. Allis-Chalmers, Ltd.
- Concrete Mixers—**  
Northern Canada Supply Co.  
Wettlaufer Bros.  
Can. Allis-Chalmers, Ltd.  
Gould, Shapley & Muir Co., Ltd.
- Condensers—**  
Smart-Turner Machine Co.  
Northern Canada Supply Co.  
Can. Allis-Chalmers, Ltd.
- Concentrating Tables—**  
Mine & Smelter Supply Co.
- Converters—**  
Northern Canada Supply Co.
- Conveyer—Trough—Belt—**  
Hendrick Mfg. Co.
- Cranes—**  
Smart-Turner Machine Co.  
M. Beatty & Sons, Ltd.
- Crane Ropes—**  
Allan, Whyte & Co.  
Can. B. K. Morton.
- Grinding Plates—**  
Hull Iron & Steel Foundries, Ltd.
- Crucibles—**  
Mine & Smelter Supply Co.
- Crushers—**  
Lymans, Ltd.  
Mussens, Limited.  
Hull Iron & Steel Foundries, Ltd.  
Wettlaufer Bros.  
Can. Allis-Chalmers, Ltd.  
Mine & Smelter Supply Co.
- Cyaniding Process—**  
Koering Cyaniding Process Co.  
Can. Allis-Chalmers, Ltd.
- Derricks—**  
Smart-Turner Machine Co.  
M. Beatty & Sons, Ltd.  
Can. Allis-Chalmers, Ltd.  
Marsh Engineering Works.
- Diamond Drill Contractors—**  
Diamond Drill Contracting Co.  
Smith & Travers.  
Sullivan Machinery Co.
- Dredger Pins—**  
Armstrong, Whitworth of Canada, Ltd.
- Dredging Machinery—**  
M. Beatty & Sons.
- Dredging Ropes—**  
Allan, Whyte & Co.  
Can. B. K. Morton.
- Drills, Air and Hammer—**  
Canadian Ingersoll-Rand Co. Ltd., Montreal, Que.  
Sullivan Machinery Co.  
Northern Canada Supply Co.  
Can. Allis-Chalmers, Ltd.
- Drills—Core—**  
Canadian Ingersoll-Rand Co. Ltd., Montreal, Que.  
Standard Diamond Drill Co.
- Sullivan Machinery Co.**  
Can. Allis-Chalmers, Ltd.
- Drills—Diamond—**  
Sullivan Machinery Co.  
Northern Canada Supply Co.
- Drill Steel—Mining—**  
Armstrong, Whitworth of Can., Ltd.  
Can. B. K. Morton.
- Drill Steel Sharpeners—**  
Canadian Ingersoll-Rand Co. Ltd., Montreal, Que.  
Northern Canada Supply Co.  
Sullivan Machinery Co.
- Drills—Electric—**  
Canadian Ingersoll-Rand Co. Ltd., Montreal, Que.  
Sullivan Machinery Co.
- Drills—High Speed and Carbon—**  
Armstrong Whitworth of Can., Ltd.  
Can. B. K. Morton
- Dynamite—**  
Canadian Explosives.  
Northern Canada Supply Co.
- Ejectors—**  
Canadian Ingersoll-Rand Co. Ltd., Montreal, Que.  
Northern Canada Supply Co.
- Elevators—**  
M. Beatty & Sons.  
Sullivan Machinery Co.  
Northern Canada Supply Co.  
Wettlaufer Bros.
- Electrical Supplies—**  
Can. Gen. Electric Co., Ltd.
- Electric Mine Locomotives—**  
Can. Gen. Electric Co., Ltd.
- Engineering Instruments—**  
C. L. Berger & Sons.
- Engineers and Contractors—**  
Foundation Co., Ltd., of Montreal.
- Engines—Automatic—**  
Smart-Turner Machine Co.
- Engines—Gas and Gasoline—**  
Alex. Fleck.  
Sullivan Machinery Co.  
Smart-Turner Machine Co.  
Can. Allis-Chalmers, Ltd.  
Gould, Shapley & Muir Co., Ltd.
- Engines—Haulage—**  
Canadian Ingersoll-Rand Co. Ltd., Montreal, Que.  
Can. Allis-Chalmers, Ltd.  
Marsh Engineering Works.
- Engines—Marine—**  
Smart-Turner Machine Co.
- Engines—Steam—**  
Smart-Turner Machine Co.  
M. Beatty & Sons.  
Can. Allis-Chalmers, Ltd.
- Fans—Ventilating—**  
Can. Allis-Chalmers, Ltd.
- Forges—**  
Northern Canada Supply Co. Ltd.
- Forging—**  
M. Beatty & Sons.  
Smart-Turner Machine Co.
- Furnaces—Assay—**  
Lymans, Ltd.  
Mine & Smelter Supply Co.
- Fuse—**  
Canadian Explosives.  
Northern Canada Supply Co.
- Generators—**  
Can. Gen. Electric Co., Ltd.
- Gears—**  
Smart-Turner Machine Co.  
Northern Canada Supply Co.  
Hull Iron & Steel Foundries, Ltd.
- Hammer Rock Drills—**  
Mussens, Limited.  
Can. Allis-Chalmers, Ltd.
- Hangers—Cable—**  
Standard Underground Cable Co. of Canada, Ltd.
- High Speed Steel—**  
Armstrong, Whitworth of Canada, Limited.
- High Speed Steel Twist Drills—**  
Northern Canada Supply Co.  
Armstrong, Whitworth of Canada, Ltd.
- Hoists—Air, Electric and Steam—**  
Can. Ingersoll-Rand Co., Ltd. Ltd., Montreal, Que.  
Jones & Glasco.  
M. Beatty & Sons.  
Marsh Engineering Works.  
Northern Canada Supply Co.  
Wettlaufer Bros.  
Can. Allis-Chalmers, Ltd.
- Hoisting Engines—**  
Mussens, Limited.  
Sullivan Machinery Co.  
Can. Ingersoll-Rand Co., Ltd.  
M. Beatty & Sons.  
Can. Allis-Chalmers, Ltd.  
Marsh Engineering Works.
- Hose—**  
Northern Canada Supply Co.
- Ingot Copper—**  
Canada Metal Co., Ltd.  
Hoyt Metal Co.
- Insulating Compounds—**  
Standard Underground Cable Co. of Canada, Ltd.
- Jacks—**  
Can. Ingersoll-Rand Co., Ltd. Ltd., Montreal, Que.  
Northern Canada Supply Co.
- Kiln Linings—**  
Hull Iron & Steel Foundries, Ltd.
- Kominuters—**  
Hull Iron & Steel Foundries, Ltd.
- Laboratory Machinery—**  
Mine & Smelter Supply Co.
- Lamps—**  
Can. Gen. Electric Co., Ltd.
- Locomotives (Steam Compressed Air and Storage Steam)—**  
H. K. Porter Company.
- Link Belt—**  
Northern Canada Supply Co.  
Jones & Glasco.
- Motors—**  
Can. Gen. Electric Co., Ltd.
- Machinists and Founders—**  
Hull Iron and Steel Foundries, Ltd.
- Metal Merchants—**  
Henry Bath & Son.  
Geo. G. Blackwell, Sons & Co.  
Consolidated Mining & Smelting Co. of Canada.  
Canada Metal Co.  
C. L. Constant Co.
- Monel Metal—**  
International Nickel Co
- Nickel—**  
International Nickel Co.
- Ore Sacks—**  
Northern Canada Supply Co.
- Ore Testing Works—**  
Ledoux & Co.  
Can. Laboratories.  
Milton Hersey Co., Ltd.  
Campbell & Deyell.  
Hoyt Metal Co.
- Ores and Metals—Buyers and Sellers of—**  
C. L. Constant Co.  
Geo. G. Blackwell.  
Consolidated Mining and Smelting Co. of Canada.  
Orford Copper Co.  
Canada Metal Co.  
Hoyt Metal Co.
- Perforated Metals—**  
Northern Canada Supply Co.  
Hendrick Mfg. Co.
- Pig Tin—**  
Canada Metal Co., Ltd.  
Hoyt Metal Co.
- Pig Lead—**  
Canada Metal Co., Ltd.  
Hoyt Metal Co.

Canadian Miners' Buying Directory.—(Continued from page 24.)

- Pipes—**  
Canada Metal Co., Ltd.  
Consolidated M. and S. Co.  
Northern Canada Supply Co.  
Smart-Turner Machine Co.
- Type Fittings—**  
Northern Canada Supply Co.
- Piston Rock Drills—**  
Mussens, Limited.  
Can. Allis-Chalmers, Ltd.
- Pneumatic Tools—**  
Can. Ingersoll-Rand Co., Ltd.  
Jones & Glasco.
- Prospecting Mills and Machinery—**  
Standard Diamond Drill Co.  
Can. Allis-Chalmers, Ltd.  
Mine & Smelter Supply Co.
- Pulleys, Shafting and Hangings—**  
Northern Canada Supply Co.
- Pulverizers—Laboratory—**  
Mine & Smelter Supply Co.
- Pumps—Boiler Feed—**  
Smart-Turner Machine Co.  
Northern Canada Supply Co.  
Can. Ingersoll-Rand Co., Ltd.  
Wettlaufer Bros.  
Can. Allis-Chalmers, Ltd.
- Pumps—Centrifugal—**  
Escher Wyss & Co.  
Mussens, Limited.  
Smart-Turner Machine Co.  
M. Beatty & Sons.  
Can. Ingersoll-Rand Co., Ltd.  
Can. Allis-Chalmers, Ltd.  
Mine & Smelter Supply Co.
- Pumps—Electric—**  
Smart-Turner Machine Co.  
Can. Ingersoll-Rand Co., Ltd.  
Can. Allis-Chalmers, Ltd.
- Pumps—Sand and Slime—**  
Mine & Smelter Supply Co.
- Pumps—Pneumatic—**  
Smart-Turner Machine Co.  
Can. Ingersoll-Rand Co., Ltd.  
Sullivan Machinery Co.
- Pumps—Steam—**  
Can. Ingersoll-Rand Co., Ltd.  
Mussens, Limited.  
Northern Canada Supply Co.  
Can. Allis-Chalmers, Ltd.  
Smart-Turner Machine Co.
- Pumps—Turbine—**  
Smart-Turner Machine Co.  
Can. Ingersoll-Rand Co., Ltd.  
Can. Allis-Chalmers, Ltd.
- Pumps—Vacuum—**  
Smart-Turner Machine Co.  
Can. Allis-Chalmers, Ltd.
- Quarrying Machinery—**  
Sullivan Machinery Co.  
Can. Ingersoll-Rand Co., Ltd.  
Can. Allis-Chalmers, Ltd.
- Roofing—**  
Northern Canada Supply Co.
- Rope—Manilla and Jute—**  
Jones & Glasco.  
Northern Canada Supply Co.  
Allan, Whyte & Co.
- Rope—Wire—**  
Allan, Whyte & Co.  
Northern Canada Supply Co.  
Can. B. K. Morton
- Steel—High Speed—**  
Can. B. K. Morton
- Samplers—**  
C. L. Constant Co.
- Ledoux & Co.**
- Milton Hershey Co.**
- Thos. Heys & Son.**
- Mine & Smelter Supply Co.**
- Screens—**  
Northern Canada Supply Co.  
Hendrick Mfg. Co.
- Screens—Cross Patent Flanged Lip—**  
Hendrick Mfg. Co.
- Separators—**  
Smart-Turner Machine Co.
- Sheet Lead—**  
Canada Metal Co., Ltd.
- Sheets—Genuine Manganese Bronze—**  
Hendrick Mfg. Co.
- Shovels—Steam—**  
M. Beatty & Sons.
- Smoke Stacks—**  
Can. Allis-Chalmers, Ltd.  
Hendrick Mfg. Co.  
MacKinnon, Holmes & Co.  
Marsh Engineering Works.
- Steel Barrels—**  
Smart-Turner Machine Co.
- Steel Drills—**  
Sullivan Machinery Co.  
Northern Canada Supply Co.  
Can. Ingersoll-Rand Co., Ltd.  
Can. B. K. Morton.
- Steel Drums—**  
Smart-Turner Machine Co.
- Steel—Tool—**  
N. S. Steel & Coal Co.  
Armstrong, Whitworth of Can., Ltd.
- Surveying Instruments—**  
C. L. Berger.
- Switchboards—**  
Can. Gen. Electric Co., Ltd.
- Tanks (Wooden)---**  
Gould, Shapley & Muir Co., Ltd.
- Tanks—Steel—**  
Marsh Engineering Works.
- Tables—Concentrating—**  
Mine & Smelter Supply Co.
- Tanks—Cyanide, Etc.—**  
Hendrick Mfg. Co.  
Pacific Coast Pipe Co., Ltd.  
MacKinnon, Holmes & Co.  
Can. Allis-Chalmers, Ltd.
- Tanks (water) and Steel Towers—**  
Gould, Shapley & Muir Co., Ltd.
- Transits—**  
C. L. Berger & Sons.
- Transformers—**  
Can. Gen. Electric Co., Ltd.
- Turbines—**  
Escher Wyss & Co.  
Can. Allis-Chalmers, Ltd.
- Twist Drills—High Speed—**  
Can. B. K. Morton Co.
- Winding Engines—Steam and Electric—**  
Can. Ingersoll-Rand Co., Ltd.  
Can. Allis-Chalmers, Ltd.  
Marsh Engineering Works.
- Wire Cloth—**  
Northern Canada Supply Co.  
B. Greening Wire Co., Ltd.
- Wire (Bare and Insulated)—**  
Standard Underground Cable Co., of Canada, Ltd.
- Zinc Spelter—**  
Canada Metal Co., Ltd.  
Hoyt Metal Co.

ALPHABETICAL INDEX TO ADVERTISERS

<p><b>A</b></p> <p>Alderson, Baker &amp; Gaebelen ... 21</p> <p>Allan, Whyte &amp; Co. .... 5</p> <p>American Zinc Lead &amp; Smelting Co. .... 5</p> <p><b>B</b></p> <p>Bath, Henry &amp; Son ..... 22</p> <p>Balbach Smelting &amp; Refining Co. 22</p> <p>Beatty, Blackstock, Fasken, Cowan &amp; Chadwick ..... 20</p> <p>Beatty, M., &amp; Sons ..... 5</p> <p>Berger, C. L., &amp; Sons ..... 22</p> <p>Blackwell, Geo. G., Sons &amp; Co. 22</p> <p>British Columbia, Province of... 10</p> <p>Burns &amp; Roberts ..... 15</p> <p><b>C</b></p> <p>Callow, J. M. ....s..... 18</p> <p>Campbell &amp; Deyell, Ltd. .... 20</p> <p>Canadian General Electric Co., Limited. .... 16</p> <p>Canadian Explosives, Ltd. .... 23</p> <p>Canadian H. K. Porter, Ltd. .... 15</p> <p>Canadian Ingersoll-Rand Co., Ltd., Montreal, Que. .... 1</p> <p>Canadian Laboratories, Ltd. .... 20</p> <p>Canada Metal Co. .... 19</p> <p>Canadian Milk Products, Ltd. .. 12</p> <p>Canadian B. K. Morton Co., Ltd. 7</p> <p>Canadian Steel Foundries, Ltd.... 10</p> <p>Capper Pass &amp; Son, Ltd. .... 22</p> <p>Consolidated Mining &amp; Smelting Co. .... 22</p> <p>Coniagas Reduction Co., Ltd. ... 22</p> <p>Constant, C. L., &amp; Co. .... 22</p> <p>Cleveland Pneumatic Tool Co. of Canada, Ltd. .... 3</p> <p><b>D</b></p> <p>Deloro Smelting &amp; Refining Co.. 22</p> <p>Denver Rock Drill Mfg. Co. .... 17</p> <p>Department of Mines, Canada... 5</p> <p>Dewar Mfg Co. .... 5</p> <p>Diamond Drill Contracting Co... 5</p> <p>Dominion Coal Co., Ltd. .... 21</p> <p>Dominion Engineering &amp; Inspection Co. .... 26</p>	<p>Dominion Iron &amp; Wrecking Co. .... 19 and 21</p> <p>Dominion Steel Foundry, Ltd. ... 3</p> <p>Dominion Tar &amp; Chemical Co. ... 12</p> <p>Dorr Co. .... 20</p> <p>Dwight &amp; Lloyd Sintering Co., Inc. .... 2</p> <p><b>E</b></p> <p>Everett &amp; Co. .... 4</p> <p><b>F</b></p> <p>Ferrier, W. F. .... 20</p> <p>Fleck, Alex. .... 3</p> <p>Foundation Co. of Montreal .... 5</p> <p><b>G</b></p> <p>Gartshore, John J. .... 21</p> <p>General Engineering Co. .... 21</p> <p>Goldsmith Bros. Smelting &amp; Refining Co., Ltd. .... 5</p> <p>Gould, Shapley &amp; Muir Co., Ltd... 5</p> <p>Greening, B. Wire Co. .... Outside Front Cover</p> <p><b>H</b></p> <p>Hassan, A. A. .... 20</p> <p>Hamilton Gear &amp; Machine Co... 5</p> <p>Hendrick Mfg. Co. .... 6</p> <p>Hershey, Milton Co., Ltd. .... 20</p> <p>Heys, Thomas &amp; Son ..... 20</p> <p>Hitchcock, C. H. .... Outside Back Cover</p> <p>Hull Iron &amp; Steel Foundries, Ltd. .... Outside Back Cover</p> <p>Hoyt Metal Co. .... 2</p> <p><b>I</b></p> <p>Imperial Bank of Canada ..... 6</p> <p>Industrial &amp; Technical Press... Outside Back Cover</p> <p>International Nickel Co. .... 6</p> <p><b>J</b></p> <p>Johnson, Matthey &amp; Co. .... 20</p> <p>Jones &amp; Glasco ..... 15</p> <p><b>K</b></p> <p>Kayser, Ellison &amp; Co. .... 15</p> <p><b>L</b></p> <p>Ledoux &amp; Co. .... 20</p> <p>Lindsey, G. G. S. .... 20</p> <p>Longyear, E. J. Co. .... 4</p> <p>Lymans, Ltd. .... 6</p>	<p><b>M</b></p> <p>MacKinnon, Holmes &amp; Co. .... 7</p> <p>Marsh Engineering Work, Ltd... 14</p> <p>McEvoy, Jas. .... 20</p> <p>Mine &amp; Smelter Supply Co. .... 11</p> <p>Minerals Separation North American Corporation ..... 9</p> <p>Mond Nickel Co. .... 4</p> <p>Murphy, Chas. J. .... 20</p> <p>Mussens, Limited ..... 12</p> <p><b>N</b></p> <p>Northern Canada Supply Co., Ltd. 2</p> <p>Nova Scotia Steel &amp; Coal Co.... 4</p> <p>Nova Scotia Government ..... 8</p> <p><b>O</b></p> <p>Ontario, Province of..... Inside Back Cover</p> <p><b>P</b></p> <p>Pacific Coast Pipe Co., Ltd. .... 7</p> <p>Prest-O-Lite Co., Inc. .... 8</p> <p><b>Q</b></p> <p>Quebec, Province of ..... 8</p> <p><b>R</b></p> <p>Ridout &amp; Maybee ..... 21</p> <p>Rogers, John C. .... 20</p> <p>Rogers, Geo. R. .... 20</p> <p>Ross Engineering Co..... 20</p> <p><b>S</b></p> <p>Smart-Turner Machine Co. .... 20</p> <p>Smith &amp; Travers Diamond Drill Company ..... 20</p> <p>Smith &amp; Durkee Diamond Drill Company ..... 20</p> <p>Standard Underground Cable Co. of Canada, Ltd. .... 15</p> <p>Stewart, Robert H. .... 20</p> <p>Sullivan Machinery Co. .... Inside Front Cover</p> <p><b>T</b></p> <p>Toronto Testing Laboratory, Ltd. 20</p> <p>Tyrrell, J. B. .... 20</p> <p><b>U</b></p> <p>University of Toronto ..... 22</p> <p><b>W</b></p> <p>Wettlaufer Bros., Ltd. .... 5</p> <p>Whitman, Alfred R. .... 22</p> <p><b>Z</b></p> <p>Zenith Coal and Steel Products Ltd. .... 3</p>
---	---	---



PROVINCE OF ONTARIO



BUREAU OF MINES

# Ontario's Mining Lands

Ontario, with its 407,262 square miles of area contains many millions of acres in which the geological formations are favorable for the occurrence of minerals, 70 per cent. of the rocks being of pre-Cambrian age. The phenomenally rich silver mines of Cobalt occur in these rocks; so also do the far-famed nickel-copper deposits of Sudbury, the gold of Porcupine and Kirkland Lake, and the iron ore of Helen, Magpie and Moose Mountain mines.

Many other useful minerals, both metallic and non-metallic, are found in Ontario:— actinolite, apatite, arsenic, asbestos, cobalt, corundum, feldspar, fluorspar, graphite, gypsum, iron pyrites, mica, molybdenite, natural gas, palladium petroleum, platinum, quartz, salt and talc.

Building materials, such as marble, limestone, sandstone, granite, trap, sand and gravel, meet every demand. Lime, Portland cement, brick and tile are manufactured in quantity within the Province.

Ontario in 1917 produced 46 per cent. of the total mineral output of Canada. Preliminary returns made to the Ontario Bureau of Mines show the output of the mines and metallurgical works of the Province for the year 1917 to be worth \$71,060,942, of which the metallic production was \$56,845,788.

The prospector can go almost anywhere in the mineral regions in his canoe; the climate is invigorating and healthy, and there is plenty of wood and good water. A miner's license costs \$5.00 per annum, and entitles the holder to stake out in any or every mining division three claims of 40 acres each. After performing 240 days' assessment work on a claim, patent may be obtained from the Crown on payment of \$2.50 or \$3.00 per acre, depending on location in surveyed or unsurveyed territory.

For list of publications, illustrated reports, geological maps and mining laws, apply to

**G. H. FERGUSON,**

MINISTER OF LANDS, FORESTS AND MINES, —

**Toronto, Canada**

# Chromnic The Steel that Wears

**F**OR crushing plates and all parts of crushing machinery and stamp mills. Also cams, tappets, shoes and dies. This steel out-wears and outlasts any other make by 25%. It has stood the most exhaustive tests and excels the much vaunted Krupp steel.

We make castings of "Chromnic" steel for all mining machinery, and guarantee quick service.

The next time you order parts---try Chromnic steel.

*Makers of Steel Castings of all kinds*

**Hull Iron & Steel Foundries**  
**HULL LIMITED QUEBEC**

---

## PRINTING AND PUBLISHING

---

We wish to draw the attention of mining, metallurgical, and development corporations to our excellent facilities for compiling, arranging, illustrating, printing and distributing Annual Statements, Special Reports, Descriptive Pamphlets, etc.

We guarantee our work in all respects. In letter-press, half-tone engravings and reproductions in color, we are prepared to give entire satisfaction.

We shall be glad to furnish estimates to enquirers.

ADDRESS

**Industrial and Technical Press Ltd.,**

**263-5 ADELAIDE ST. WEST,  
TORONTO**

OR

**Canadian Mining Journal,**

**263-5 ADELAIDE ST. WEST  
Toronto**