

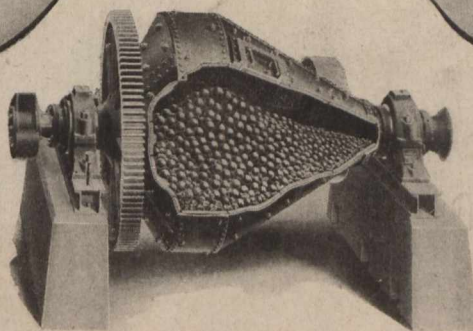
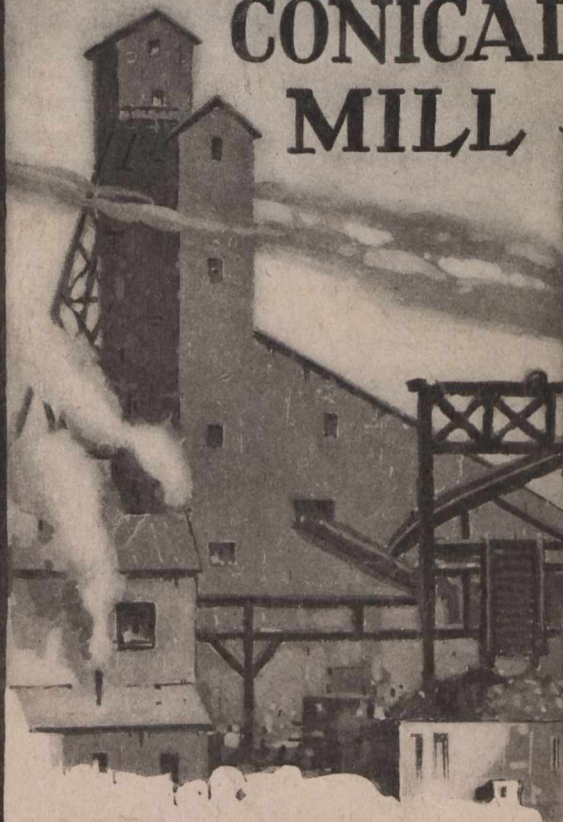
CANADIAN MINING JOURNAL

Vol. XLI.

Garden City Press, Ste. Anne de Bellevue, April 16, 1920.

No. 15.

HARDINGE CONICAL MILL



IT WILL do your grinding at a reduction in power consumption — it will increase your production, and at a lower cost. The leading mining companies all over the world — among which may be your very neighbors — are successfully using the Hardinge Conical Mill for their grinding. Their complete satisfaction is evidenced by their continuous repeat orders.

Write for literature and investigate its merits.

HARDINGE COMPANY

120 BROADWAY NEW YORK

BRANCH OFFICES

WORKS
YORK, PENN
DENVER, COLO.
ERITH, ENG.

DENVER COLO., FIRST NAT. BANK BLDG-
SPOKANE WASH., OLD NAT. BANK BLDG-
SALT LAKE CITY, UTAH, NEWHOUSE BLDG-
LONDON, SALISBURY HOUSE

CABLE
ADDRESS
"HARDINGMIL
NEW YORK"

"TITANIC"

MINER'S DRILL STEEL

Specially prepared after many years experience as being the most suitable for use with all our different types of Hammer Rock Drills

CORPORATE MARK,



GRANTED 1833.

HOLLOW

HEXAGON

OCTAGON

SOLID

ROUND

Cruciform



PROMPT SHIPMENTS FROM STOCK

SAM'L OSBORN (CANADA) LIMITED
MONTREAL

Branches and Stock

Toronto

Vancouver

CANADA

DEPARTMENT OF MINES

HON. ARTHUR MEIGHEN, *Minister* R. G. McCONNELL, *Deputy Minister*

MINES BRANCH

Recent Publications

Iron Ore Occurrences in Canada, Vol. II. 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 (British Columbia). Vol. V., by W. A. Parks, Ph.D.

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, by J. Blizard, B.Sc.

Analyses of Canadian Fuels. Parts I to V, by E. Stansfield, M.Sc., and J. H. H. Nicolls, M.Sc.

Clay Resources of Southern Saskatchewan, by N. B. Davis, M.A., B.Sc.

Summary Report of the Mines Branch, 1918.

The Mineral Springs of Canada. Part II., by 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

Summary Report. The annual Summary Report of the Geological Survey is now printed in parts. Applicants should therefore, state what particular geologist's report is required, or what subjects they are interested in.

Memoir 105. Amlsk-Athapapuskow Lake district, by E. L. Bruce.

Memoir 108. The Mackenzie River basin, by Charles Cam-sell and Wyatt Malcolm.

Memoir 109. The Harricanaw-Turgeon basin, northern Quebec, by T. L. Tanton.

Memoir 110. Preliminary report on the economic geology of Hazelton district, British Columbia, by J. J. O'Neill.

Memoir 111. The Silurian geology and faunas of Ontario peninsula and Manitoulin and adjacent islands, by M. Y. Williams.

Memoir 112. Geology of the district belt of southwestern Alberta, by J. S. Stewart.

Memoir 113. Geology and mineral deposits on a part of Amherst township, Quebec, by M. E. Wilson.

Memoir 114. Road material surveys in the city and district of Montreal, Quebec, by Henri Gauthier.

Memoir 116. Investigations in the gas and oil fields of Alberta, Saskatchewan and Manitoba, by D. B. Dowling, S. E. Slipper and F. H. McLearn.

Museum Bulletin 30. Gabbros of East Sooke and Rocky Point, by H. C. Cooke.

Map 164A. St. John, New Brunswick. Topography.

Map 183A. Harricanaw-Turgeon basin; Abitibi, Timiskaming and Pontiac, Que. Geology.

Map 1585. Mackenzie River basin. Geology.

Map 1680. Portions of Grenville, Harrington, Chatham and Wentworth townships, Argenteuil county, Quebec. Geology.

Map 1708. Bridge river, Lillooet district, B.C. Topography.

May 1712. Foothills of Southern Alberta, St. Mary river to Hig-wood river. Geology.

May 1714. The Niagara peninsula, Ontario. Geology.

May. 1715. The Ontario peninsula. Geology.

Map 1724. Sheep River, Alberta. Geology.

Map 1726. Athapapuskow Lake region. Geology.

Applicants for publications not listed above should mention the precise area concerning which information is desired.

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.



PROVINCE OF ONTARIO



BUREAU OF MINES

HON. H. MILLS, Minister of Mines.

Ontario's Mining Lands

Ontario, with its 407,262 square miles, contains many millions of acres in which the geological formations are favorable for the occurrence of minerals, 70 per cent of the area being underlain by rocks 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 Magpie and Moose Mountain Mines.

Practically all economic minerals (with the exception of coal and tin) 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 tale. This Province has the largest deposits on the continent of tale, feldspar, mica and graphite.

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

Ontario in 1918 produced 45 per cent. of the total mineral output of Canada. Returns made to the Ontario Bureau of Mines show the output of the mines and metallurgical works of the Province for the year 1918 to be worth \$80,308,972 of which the metallic production was \$66,178,059.

Dividends and bonuses paid to the end of 1918 amounted to \$13,359,210 for gold mining companies, and \$74,810,521 for silver mining companies, or a total of \$88,169,733.

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. Hydro-electric power is available in many parts of the Province, and many undeveloped water-powers remain to be harnessed. 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 day's 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

Thos. W. Gibson,

Deputy Minister of Mines,

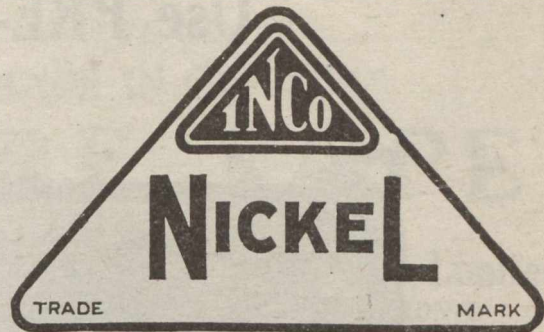
Toronto, Canada

Metallic Nickel. 98.40—99.00%

Shot
HIGH AND LOW CARBON

Ingots
25 LB. AND 50 LB. SIZES

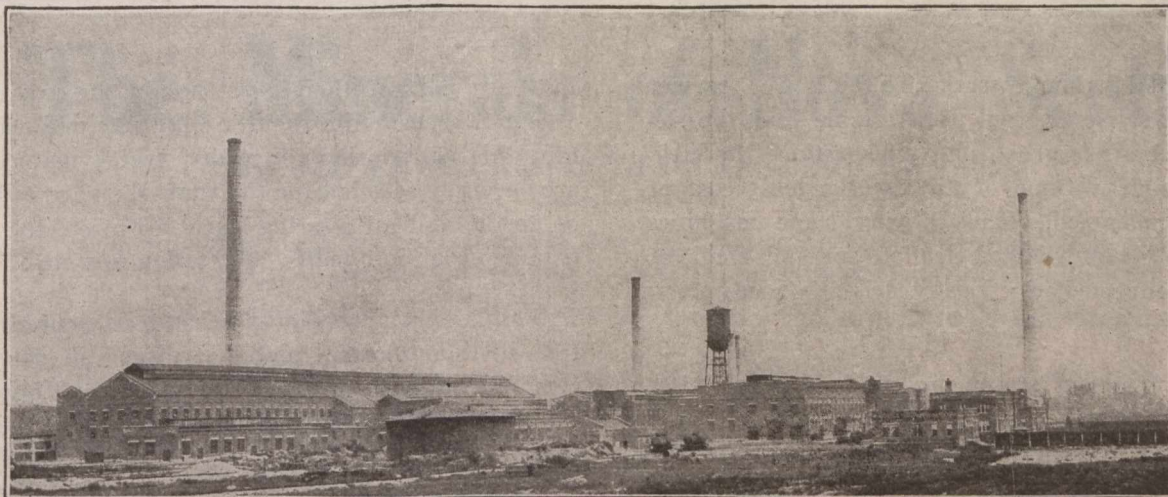
Nickel Oxide 77.2%



PRIME METALS OF UNIFORMLY HIGH QUALITY
AND HIGH NICKEL CONTENT FOR THE MANU-
FACTURE OF NICKEL-STEEL, NICKEL-SILVER,
ANODES AND ALL REMELTING PURPOSES.

Our best technical advice is at your service.

THE HOME OF INCO NICKEL



Refining Division

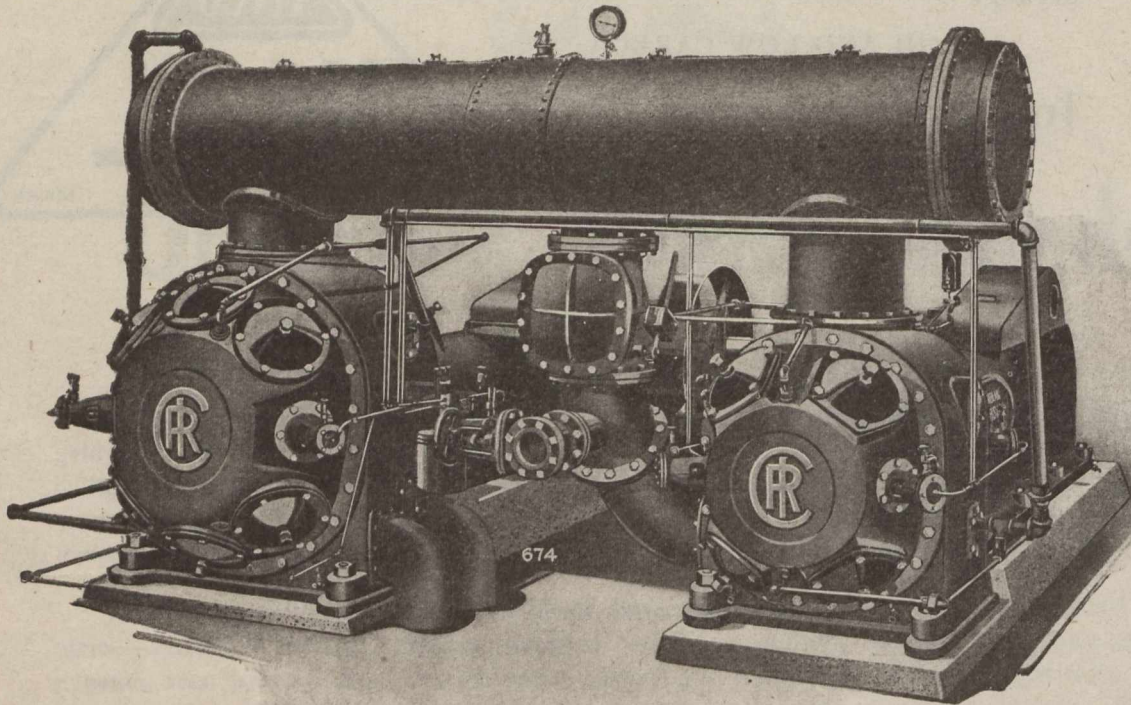
Port Colborne, Ont.

The International Nickel Company of Canada, Limited

HARBOR COMMISSION BUILDING

Toronto, Ont.

Where Economy and Reliability are Essential Use PRE-2 Compressors



Class PRE-2 Compressors are built for service where electric current is available and the demand for air is great, and will produce the largest possible volume of air for the least cost of power consumed. This is why these machines are the acknowledged leaders in the field of direct connected, electrically driven air compressing units.

A pretty strong statement, we will admit, but one that is easily and conclusively proven by the experience of many satisfied users, among whom are some of the largest mining companies in the world.

In every part of their construction the greatest care is taken to build them so that they will maintain this superiority for many years; materials are specially selected for the work they are called on to do, and all wearing parts are protected by trouble-proof automatic lubrication systems.

The highest compression efficiency is secured by I-R silent automatic inlet and discharge valves, complete water jacketing of cylinders and heads, efficient intercooling and liberal port and valve areas. Regulation is entirely automatic and is effected in five stages by a simple and reliable clearance controller.

You will find bulletin K-204 very informing on modern two-stage compressors. Ask our nearest branch for your copy.

Canadian Ingersoll-Rand Company, Limited

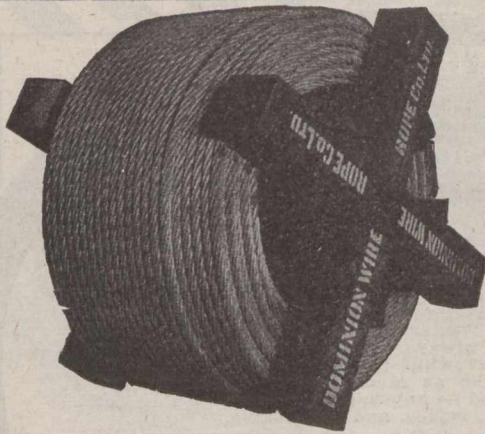
Sydney

Sherbrooke
Winnipeg

Montreal
Nelson

Toronto
Vancouver

Cobalt



Where **DURABILITY** counts

USE OUR

"MADE IN CANADA"

WIRE ROPE

The **DOMINION WIRE ROPE CO., Limited**

MONTREAL

WINNIPEG

TORONTO

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**

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,

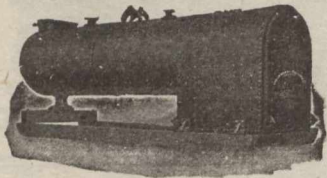
HALIFAX, N.S.

Commissioner of Public Works and Mines

BOILERS

locomotive — vertical — horizontal

Our workmanship and our service
are eminently reliable.



ORE CARS

Tanks and all kinds of Plate Work

35 years experience at your call

**ENGINEERING & MACHINE
WORKS OF CANADA, Limited**

ST. CATHARINES, ONTARIO

*Eastern Sales Offices: Birks Building, Montreal, and
Hall Machinery Co., Sherbrooke.*

This Convenient Powdered Separated Milk

KLIM is absolutely fresh pasteurized separated milk in its lightest and most easily transported form

A dry powder that will not freeze in Winter nor sour in Summer. Klim is always fresh and ready for use. Just whip the powder into water and make as much separated milk as you need — anytime — anywhere. Fine for tea, coffee, and all cooking.

In 10 pound tins—6 to the case—
order from your Supply House.



**CANADIAN MILK
PRODUCTS LIMITED**

TORONTO

St. John Montreal
Winnipeg

SANDERSON BROS. & NEWBOULD'S



Hexagon Hollow Mining Drill Steel

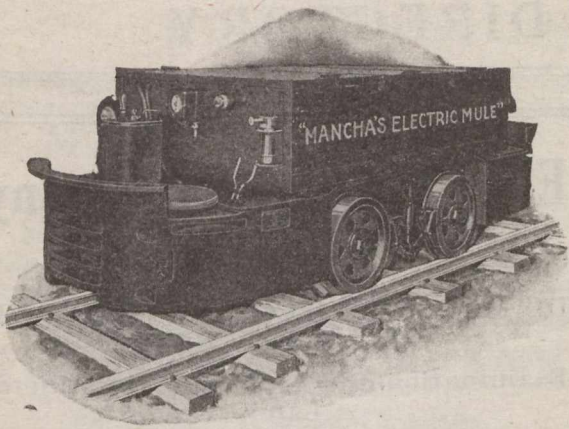
Large Stocks Carried by

H.A. DRURY COMPANY
LIMITED

Montreal

Agents for British Columbia:
GORDON & BELYEA, LIMITED
VANCOUVER

Toronto



**LOWER YOUR HAULAGE COSTS—
INCREASE YOUR PRODUCTION**

There is no argument against the practical value of a

MANCHA STORAGE BATTERY LOCOMOTIVE

for mine haulage except where there is not a sufficient daily tonnage. Made in capacities 1½ ton to 6 ton, all gauges, for any mine specification.

We would like to submit a complete proposition. Let us have a synopsis of your problems.



Edison Batteries guarantees 10 years' uninterrupted service

POWLEY & TOWNSLEY

907 Excelsior Life Building - TORONTO

Industrial Transportation Engineers

CRANE MALLEABLE FITTINGS

**CRANE
LIMITED**

HEAD OFFICE & WORKS
1280 ST. PATRICK ST

MONTREAL

BRANCHES: Toronto, Winnipeg, Vancouver
SALES OFFICES: Halifax, Quebec, Ottawa, Calgary

**Canada Wire and
Iron Goods Co.**

Manufacturers of

WIRE ROPE

FOR ALL PURPOSES

TESTING SIEVES IN ALL MESHES

ENQUIRIES SOLICITED

Have you our Catalogue?

Hamilton - - - Canada

NEVER BE IN DOUBT

**Harris Heavy Pressure and
Imperial Genuine Babbitt Metal**



WILL FILL ALL REQUIREMENTS FOR
MINING MACHINERY



Our Guarantee is back of every pound we make.
We specialize in Babbitt, Solder, Lead Pipe, Sheet Lead
and all Ingot Metals.

Our New book on Babbitt Problems is free. Ask for it.

THE CANADA METAL COMPANY LIMITED

HAMILTON
MONTREAL

TORONTO

WINNIPEG
VANCOUVER

PROFESSIONAL DIRECTORY

J. MACKINTOSH BELL

MINING ENGINEER & GEOLOGIST
Office with Messrs. BAIN, BICKNELL & CO., Lumsden
Building, TORONTO.
London Address: c/o Bank of New Zealand,
1 Queen Victoria Street, E.C.

Dwight & Lloyd Sintering Company, Inc.

*SPECIAL PROBLEMS
IN ORE TREATMENT*

29 BROADWAY, NEW YORK CITY
Cable Address:—"SINTERER."

Canadian Laboratories, Limited

ASSAYERS AND CHEMISTS
410 Crown Office Building, TORONTO
"We Analyse Anything."

Special Rates Send for Prices Phone Main 5063

Cables: "REVORG," Toronto Telephone Main 6870
(Western Union and Bedford McNeil Codes)

GROVER & GROVER

BARRISTERS, SOLICITORS, ETC.

George A. Grover
John I. Grover

157 Bay Street
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*

J. T. DONALD & CO.

ASSAYERS

Industrial and Analytical Chemists
Metallurgical Analyses, Microphotographs

318 Lagachetiere St. W.
MONTREAL

43 Scott Street
TORONTO

SMITH & TRAVERS COMPANY

LIMITED

CONTRACT DIAMOND DRILLING
FOUNDATIONAL WORK A SPECIALTY
DIRECTION OF EXPLORATORY WORK
DETAILED GEOLOGICAL MAPPING
SAMPLING AND VALUATION OF MINES
MINES EXPLORED FOR AN INTEREST

SUDBURY :: :: 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.

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

Telephone Main 3813

E. M. Chadwick, K.C.
David Fasken, K.C.
M. K. Cowan, K.C.
Harper Armstrong
Alexander Fasken
Hugh E. Rose, K.C.
Geo. H. Sedgewick.
James Aitchison

Cable Address: "Chadwick" Toronto
Western Union Code

Fasken, Robertson, Chadwick & Sedgewick
Barristers, Solicitors, Notaries

Offices: Bank of Toronto,
Cor. Wellington & Church Sts.
58 Wellington St. East, Toronto

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

SUDBURY DIAMOND DRILLING COMPANY LIMITED

We contract for all classes of Diamond
Drill work.

Saving a large percentage of Core is
our specialty.

We solicit enquiries.

SUDBURY, ONT. - - Box 958

PROFESSIONAL DIRECTORY

M. P. McDONALD
MINING ENGINEER

EXAMINATIONS, SAMPLING, REPORTING
EXPLORATION AND ASSESSMENT WORK

Telephone 6 COBALT

MILTON HERSEY COMPANY LTD.

MINING ENGINEERS AND ASSAYERS

EXAMINATION OF MINERAL PROPERTIES
MINE OPERATION AND MANAGEMENT
ASSAYING AND ANALYSING OF ALL ORES

MONTREAL JAS. G. ROSS WINNIPEG
Consulting Mining Engineer

THE DORR COMPANY

Metallurgical and Industrial Engineers

DENVER NEW YORK LONDON, E.C.
1009 17th St. 101 Park Ave. 16 South St.

JOHN A. DRESSER

MINING GEOLOGIST

701 Eastern Townships Bank Building
MONTREAL, CANADA

JAMES McEVOY

MINING ENGINEER AND GEOLOGIST

(Specialty Coal Mining)

77 Toronto Arcade, Yonge St., TORONTO, Ont.

Phone Main 1889

ROBERT H. STEWART

MINING AND METALLURGICAL ENGINEER

VANCOUVER BLOCK

VANCOUVER, B.C.

GEO. R. ROGERS

MINING ENGINEER

905 TRADERS BANK BUILDING, TORONTO

Examinations, Sampling and Re-
porting on Mines and Prospects

Telephone M. 2625

Alfred R. Whitman

Mining Geologist

UNDERGROUND PROGRAMMES. OREBODY PROBLEMS

43 Exchange Place, - - - New York

HAILEYBURY, ONT., Opposite Post Office

W. F. FERRIER

CONSULTING

MINING ENGINEER AND GEOLOGIST

204 Lumsden Bldg. Toronto, Ont.

J. B. TYRRELL

Mining Engineer,

534 CONFEDERATION LIFE BUILDING
TORONTO, - - - CANADA

208 Salisbury House, London, E.C. 2, England

JOHN C. ROGERS

MINING ENGINEER

Examination and Exploration of Mining Properties
with a View to Purchase.

COPPER CLIFF - ONTARIO

Phone M. 1889 Established 1873. Cable address "Heys"

THOS. HEYS & SON

Technical Chemists and Assayers

Rooms M and N, Toronto Arcade
YONGE STREET, :: TORONTO, ONT.

Sampling Ore Deposits a Specialty.

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

R. W. BRIGSTOCKE

MINING ENGINEER

21 Manning Arcade Annex
TORONTO, - - - ONTARIO

DOMINION ENGINEERING & INSPECTION CO.

Testing Engineers and Chemists
Mill, Shop and Field Inspection of Steel Structures.
Tests and Inspection of Iron and Steel Pipe, etc.
Locomotives, Cars, New and Second-Hand Equipment.
Testing of Metals, Cement, Etc., - Industrial Chemistry,
Metallurgy a Specialty.

HEAD OFFICE & LABORATORIES

320 LaGauchetiere Street West, Montreal.

BRANCH OFFICES: - Toronto and Winnipeg.

A. A. HASSAN

CONSULTING GEOLOGIST
and ENGINEER OF MINES

Westbrook Hotel Bldg., FORT WORTH, TEXAS

Any Code

Cable Address: "HASSAN"



CUT GEARS

All Types Any Size
Large Capacity.

Hamilton Gear Company Limited
Van Horne St. . . . TORONTO

L. P. BURNS, LIMITED
Manufacturers of STEEL PLATE WORK
Tanks, Penstocks; Smokestacks, etc.
Dealers in Railway and Power Plant Machinery
BANK OF HAMILTON BUILDING - TORONTO

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

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.

NEW **RAILS** RELAYING
12 to 85 lbs. per yard

Locomotives
Switches, Turntables, Cars, Tools
Portable Track, etc.

Railway, Contractors and Mining
Equipment

JNO. J. GARTSHORE
58 Front St. West . . . Toronto, Ont.

PLATINUM
BOUGHT AND SOLD

GOLDSMITH BROS.
SMELTING & REFINING CO. LTD.
24 Adelaide Street West
TORONTO

NEW YORK CHICAGO SEATTLE

BERGER
Monitor Transits & Levels
FOR USE IN MINES
C. L. BERGER & SONS
BOSTON, MASS., U. S. A.

J. M. CALLOW President GENERAL ENGINEERING COMPANY (Canadian Branch)
CONSULTING METALLURGICAL 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.)
New York Office, 120 Broadway

H. H. CLAUDET Canadian Representative

PATENTS
TRADE MARKS AND DESIGNS
PROCURED IN ALL COUNTRIES

Special attention given to Patent Litigation
Pamphlets sent free on application

RIDOUT & MAYBEE
156 YONGE STREET, TORONTO, ONT.

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.

ESTABLISHED - 1873
IMPERIAL BANK
 OF CANADA

HEAD OFFICE : TORONTO

Capital Paid Up \$7,000,000
 Reserve Fund \$7,500,000

Branches in Northern Ontario at
 Cobalt, South Porcupine, Cochrane, New
 Liskeard, North Bay, Matheson, Smooth
 Rock Falls, Kirkland Lake, Timmins and
 Hearst.

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

To Manufacturers

Valuable economic minerals, of
 which the people of this country
 as a rule have little knowledge,
 are distributed in various sections
 served by the Canadian National
 Railways. The field of utility for
 these minerals is constantly expand-
 ing and entering more and more
 into the realm of manufacture.

Information on this subject can be
 obtained by writing:—

**The Industrial and Resources
 Department Canadian National
 Railways**

TORONTO :: ONTARIO

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

BUILD FOR THE FUTURE! USE STEEL CONSTRUCTION
ELEVATED STEEL TANKS

for
 RAIL-ROAD, MUNICIPAL
 and
 FIRE-PROTECTION SERVICE



INQUIRIES INVITED ON ALL OTHER CLASSES OF HEAVY PLATE WORK

CANADIAN CHICAGO BRIDGE & IRON CO., LIMITED
 Sales Office: MONTREAL, Quebec, 260 St. James St.
 Works: BRIDGEBURG, Ontario

Electric Steel & Engineering, Ltd.

HEAD OFFICE:

WELLAND, - ONTARIO

MINING MACHINERY

ELECTRIC STEEL CASTINGS

HYDRAULIC MACHINERY

WORKS:

THE ELECTRIC STEEL & METALS CO., Limited - - WELLAND, ONT.

BOVING HYDRAULIC & ENGINEERING CO., Ltd. - LINDSAY, ONT.

THE WABI IRON WORKS, Limited - - - NEW LISKEARD, ONT.

ELECTRIC STEEL & ENGINEERING, LTD.

WELLAND - ONTARIO

Canadian Mining Journal

PUBLISHED WEEKLY.

Devoted to the Science and Practice of Mining, Metallurgy and the Allied Industries; and more particularly to their progress in Canada.

VOL. XLI.

GARDEN CITY PRESS, 16th April, 1920
Ste. Anne de Bellevue, Que.

No. 15

CONTENTS

Pages 285 to 304.

Editorial:—

- The Mines Act of 1907 305
Little discussion of Papers or Topics at the Annual Meeting of the Institute 305
In Memory of Captain O. E. LeRoy 306
Results of the Industrial Conference 306
Gold Production in Nova Scotia 307
Captain LeRoy Memorial. University of British Columbia 307

Correspondence:—

- The Petroleum Hysteria of the "Engineering and Mining Journal" "Canada's Alleged Autonomy" 308

Book Review:—

- "Further Incidents in the Life of a Mining Engineer" 309
The Department of Mines of Canada. Its Organization and Its Work 310

- Geologists Leave the Civil Service 314
Report on the Metalliferous Mines of Nova Scotia. With Special Reference to Gold Mining during 1919 314
Nova Scotia Notes 315
Northern Ontario Letter 316
Toronto Notes 318
Manitoba Letter 320
Port Arthur Notes 320
Advisory Conference Committee on Engineering Legislation in Ontario 318

Obituary:—

- Elias Rogers 307
Edward Hall Carter 315
J. A. M. Alley 318
A United States View of the Canadian Fuel Problem. Cartoon, from "Coal Age" of New York 319

Published every Friday by The Mines Publishing Co., Limited, at the Garden City Press, Ste. Anne de Bellevue, Que. 'Phone 165.

J. J. Harpell, Managing Director.

A. S. Christie, Eastern Manager,
Room 205 Drummond Building, Montreal.
'Phone Uptown 7773.

H. W. Thompson, Western Manager,
1402 C.P.R. Building, Toronto.
'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager,
528 Winch Building, Vancouver, B.C.
'Phone Sey. 3920.

Changes in advertisements should be in the Publishers' hands ten days before the date of issue.

F. W. GRAY, M. I. Min. E., Editor,
Ste. Anne de Bellevue, Quebec.

REGINALD E. HORE, Consulting Editor,
1403 C. P. R. Building, Toronto

The editor cordially invites readers to submit articles of practical interest which, on publication will be paid for.

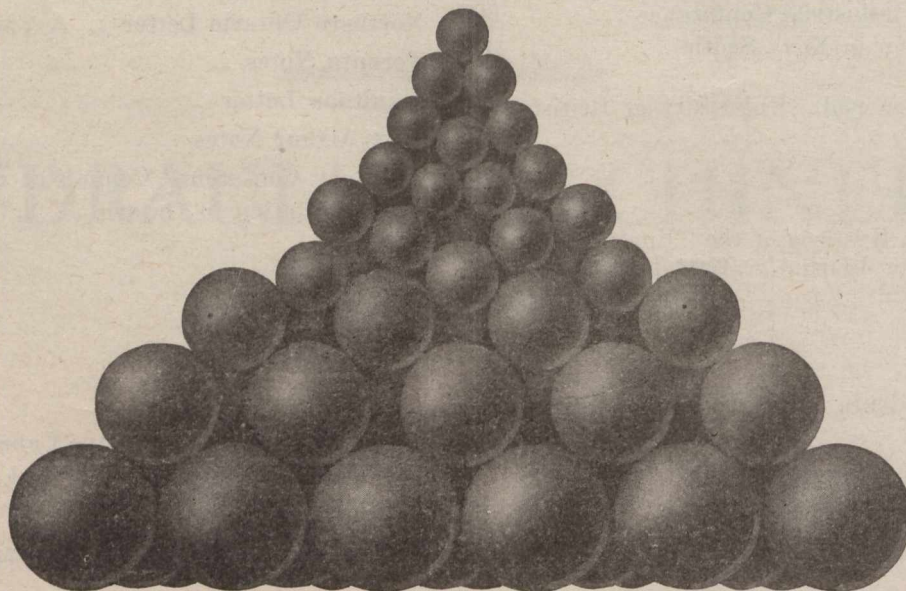
Subscription to any address in Canada, United States and British Empire, \$5.00 yearly. Other countries postage extra. Single copies 15 cents.

"If quality counts use 'HISCO' Products"

"HISCO" BALLS

"HISCO" products are noted for superior quality. "HISCO" products are made in Canada from Canadian ore by Canadian skilled workmen. The "HISCO" Forged Ball is one of the many "HISCO" products. Absolutely the best Ball on the market. The use of "HISCO" Forged Balls in your mills will substantially reduce your grinding costs. Money saved is money earned.

BUY "HISCO" BALLS



Sizes 3, 4, 5 and 6 inch carried in stock
Special sizes from 6 inch up, made to order

Write us for quotations on your requirements

HULL IRON & STEEL FOUNDRIES, LIMITED

Makers of Mining Equipment

HULL,

CANADA

EDITORIAL

The Mines Act 1907

We are publishing, for the information of our readers, and abstract of the Mines Act, 1907, under which the Department of Mines at Ottawa was established. Some information on the old classification and salary schedules is included; this information has all been gleaned from public documents which can be obtained from the King's Printer in Ottawa free of charge.

Members of the mining profession and others interested in mining matters in Canada appear to be lamentably ignorant of the Federal Department of Mines and the organization provided under the existing law. Our issue of February 25th last contained a resolution (on page 159) unanimously adopted at the last meeting of the Mining Society of Nova Scotia re Salaries of the Geological Survey. This resolution has been forwarded to the Government at Ottawa and, among other things, "Urges on the Minister of Mines the complete reorganization of the Department, including the uniting of the Geological and Mining Branches under one executive head."

Strange to relate these two Branches not only are perfectly logical divisions of the work of the Department but were definitely recommended to the Government by the Canadian Mining Institute in 1900, and this suggestion was adopted in the legislation introduced by the Hon. Clifford Sifton in 1907. The law has provided for a **single executive head** of the Department of Mines since its inception. The present executive head is Mr. Richard G. McConnell, B.A., who

has been Deputy Minister of the Department of Mines since the first of December, 1914. A reference to the text of our article on the Mines Act will show that the Geological Survey is a very large organization with a wide field, which embraces nearly all branches of Natural Science. In addition to Geology many other branches of scientific investigation are covered by the staff and the importance and value of this other work must not be overlooked.

We make these comments because we think that it is advisable that critics of the Department of Mines and would-be advisors of the Government should first carefully inform themselves as to the facts before making representations at Ottawa.

The salary question, the unrest in the Government service, and the question of resignations of the scientific staffs in Ottawa, will be dealt with more fully in a subsequent article. We wish to point out that the Department of Mines is only one of several Departments employing a scientific staff and that resignations from absolutely essential technical services have been very frequent of late throughout the whole public service. In the Department of Mines, it might be noted in passing, there have been more resignations from the Mines Branch than from the Survey, although the latter has about twice the staff. The work of certain divisions has been greatly reduced, and in some cases it may cease altogether.

Little Discussion of Papers or Topics at the Annual Meeting of the Institute

As a social gathering, and as a source of papers for inclusion in the Transactions, the recent meeting of the Institute in Toronto was an unqualified success. The papers were of high merit, and in accord with the best traditions of the Institute. There also prevailed the meeting a sense of nearness to active business affairs, and a feeling that the Institute was a real force in the direction of policies that was unusually vivid. There was also an actual participation in the meeting by men of large affairs and responsibilities that was much appreciated, particularly those features of the meeting which were made possible by the courtesy of the International Nickel Company.

Nevertheless, the meeting would have been a greater success if more discussion had taken place on the papers read, and on the topics that were listed on the programme for discussion.

For example, the symposium of papers on fuel supply represented much preparatory work by the Secretary and Committee, and can be correctly described as covering most of the phases of our fuel supply, comprising as it did papers that dealt with lignites, briquetting, oil, bituminous coal, anthracite, and questions of economics and transportation affecting fuel supply. Mr. Stirling's paper bristled with points on which discussion is needed concerning a coal field of

vital value to Canada. It is, we believe, a matter for genuine regret that this exceptionally complete symposium of fuel papers did not, as far as the coal and lignite papers are concerned, elicit any discussion at all; and, in regard to oil, an inadequate and rather irrelevant discussion.

There is no question of more pressing urgency before Canadian mining men than that of fuel supply, for upon it all the mining activities of the country are dependent. It is to be hoped that the complete absence of discussion on this matter in Toronto does not indicate a disinclination on the part of the members of the Institute to examine the fuel problem, or to tackle a question that is not made of lesser importance by fear of its many difficult phases. The Canadian Mining Institute can hardly expect definite action from those who direct the policies of Canada, if its own attitude remains obscure.

Mr. Mc. Evoy's paper on the Status of the Engineer was designed to provoke discussion. The fact that a discussion was desired was noted on the Programme, but in spite of all this no one said a word. The President explained very clearly the attitude of the outgoing Council, and the quite definite action it had taken, but if the incoming Council was looking for an expression of opinion on the part of the members to guide them in the coming year, they did not receive it. It may be that the members of the Institute so unanimously approved the action of the Council that they considered discussion unnecessary, but, as no one said anything, such a conclusion cannot be more than a surmise.

We ventured some months ago to suggest in this column that the programmes of technical society meetings are too crowded, and that papers selected for reading at the larger gatherings should be reduced to a few previously published papers, selected for discussion because of their topical, provocative or unusually important character, rather than for initial presentation.* We were also sufficiently ingenious to ask for expressions of opinion on this suggestion, but failed in this endeavor to "start something", much as the papers read in Toronto failed to elicit comment. It would, of course, be temerarious to infer that the members of the Institute are inarticulate as a body, because there is both traditional and contemporary evidence to prove that as individuals they can on occasion become loquacious, if not actually vociferous.

We believe the lack of discussion at Toronto was occasioned by the fullness of the programme, and the desire of those present to give an opportunity to every person who had prepared a paper to deliver it.

A full programme is a desirable thing, but adequate discussion is not less desirable. Is it not possible to compass both?

IN MEMORY OF CAPT. O. E. LeROY.

The "Journal" is in receipt of a communication from the University of British Columbia, published in this issue, which announces the successful commencement of the raising of a fund of ten thousand dollars for the endowment of a memorial scholarship at this University.

Simultaneously, we learn that the LeRoy Memorial Fellowship in Geology at McGill University is being founded, and that a sum of ten thousand dollars is being sought, from the proceeds of which a student will be able annually to take a post-graduate course in geology.

The "Journal" believes that those of its readers who knew the late Captain LeRoy will echo the comment of one of the McGill men who is trying—and with gratifying success—to forward the Montreal project, who, upon first learning of the Vancouver project, remarked, "Two memorials are none too many for O. E. LeRoy." The Canadian mining community is large enough and wealthy enough to justify the hopes of those who are seeking subscriptions both in the East and in the West.

J. Austen Baneroff, of the Department of Geology, McGill University, Montreal, is receiving subscriptions for the McGill Fellowship; and R. W. Brock, Dean of the University of British Columbia, Vancouver, for the Scholarship.

No memorial is so lasting, and so much in accord with our national traditions, as an educational endowment of future generations in memory of a scholar-soldier who died in battle. We recommend both these memorials to the generosity of the mining profession in Canada.

RESULTS OF THE INDUSTRIAL CONFERENCE.

It is announced that a conference with the Government is to take place at Ottawa between representatives of employers of labour, workmen, and provincial governments, with a view to unifying the existing provincial and federal laws that have to do with industrial occupations. This conference, although the fact is not announced in the newspapers, is presumably a result of the Industrial Conference held at the instance of the Minister of Labour in Ottawa last September, and is being convened by the Department of Labour. As the attention of the Federal Government is to be directed to the existing provincial statutes affecting minimum wages, mothers' pensions, workmen's compensation, factories acts, labour bureaus, hours of labour, child labour, and all legislation connected with arbitration and conciliation in labour disputes, it will be advisable for employers to keep in close touch with this very important matter.

One of the recommendations to be made that is likely to receive consideration by the Federal Government, is that urging uniform codification of workmen's compensation laws. In some of the pro-

*Issue November 26, 1919, page 879.

vines, workmen's compensation laws of much merit and fairness are being well administered, while in other provinces compensation laws exist that in one instance cause unnecessary and costly litigation and are very unsatisfactory from the workmen's point of view; and in another instance penalise the employer to an inordinate extent. It is very advisable that large employer should carefully watch the development of unification of compensation laws—which, in one form or another is a foregone conclusion—lest unfair provisions should be given wider application.

GOLD PRODUCTION IN NOVA SCOTIA.

The gold mining industry in Nova Scotia has had a hard task to exist for many years past, and production has declined year by year, but it will be readily understood that under the present conditions of labour and costs of wages and materials, the Nova Scotia industry has suffered more than that of any other part of Canada. The Mines Report states: "The continued demand for labour in other industries, together with higher rates, with no decrease in the cost of material, has had the effect of still further decreasing the output of gold in the Province." A special report on the gold mining industry has been prepared by Mr. G. F. Murphy of the Halifax Technical College, and is elsewhere published in this issue. It will be noticed that some relief from high fuel costs is hoped for from water-power electricity. Time was when Nova Scotia produced most of the gold mined in Canada, and it is to be hoped that some means will be found to prevent the entire cessation of gold mining in the Province, which appears to be not an unlikely contingency.

By the courtesy of the Editor of "Coal Age," who attended the Toronto Meeting of the Canadian Mining Institute, we reproduce in this issue a cartoon from "Coal Age" which is an example of the telling manner in which a clever cartoonist can sum up in one drawing the gist of many reams of writing. One thing we believe our readers will appreciate and admire in this cartoon is its good-natured limning, for while Miss Canada is shown wielding the hammer in business-like fashion, she is represented as a comely and youthful damsel, as we all believe her to be; and the correctness of Uncle Sam's attitude is just what one would expect from a well-bred old gentleman towards the young lady next door. Mr. Dawson Hall and the cartoonist are happy in their collaboration.

Many a fellow's prospects are bright only by contrast with his own dullness.

CAPTAIN LeROY MEMORIAL.

University of British Columbia.

In 1915 C. E. LeRoy, late of the Geological Survey, enlisted in the 72nd Seaforth Highlanders of Canada. After training with them in Vancouver, he was transferred, to help recruit and to command the company that the University of British Columbia, in its first session, was contributing to the 196th Western Universities Battalion.

While leading his company at Passchendaele in the autumn of 1917 he fell mortally wounded.

The returned boys whom he recruited, trained and led, have resolved that the memory of his life of service, his sterling qualities, his lovable nature, his generous disposition, his thoughtfulness for others, his devotion to duty, and his supreme sacrifice, shall be perpetuated as a priceless tradition to inspire present and future students of the University he so honored by his service.

It has always been a favorite, if secret, practice of Capt. LeRoy to assist needy students to attend college. Had he returned, he would now be helping some of his boys to fit themselves for leadership in civil life. The boys decided that such assistance shall continue to be forthcoming in his name. At a dinner on February 25th, the Universities Service Club undertook to raise at least \$10,000 to found the Captain LeRoy Memorial Scholarship to assist necessitous students, preference to be given first to returned soldiers and then to dependents of enlisted men. Over \$1,000 was immediately subscribed, in addition to \$250 cash paid in to permit announcing the Scholarship immediately for next session.

As the members are almost exclusively returned men who have their own financial difficulties in completing their college courses, they cannot attain this objective without outside help, but they realize that Capt. LeRoy's many friends (and all who knew him were his friends) will welcome this opportunity to assist in commemorating his memory in so appropriate a manner.

A new university stands in particular need of such scholarships; it stands in particular need of tradition to inspire its students with ideals of perfect citizenship. Returned soldiers now need such scholarships and many soldiers' orphans will need them if they are to receive the education their fathers would have provided for them. There will always be good students who can never receive a university training except by this means.

There is every incentive to make this memorial a worthy one. Anyone who wishes to be associated with this undertaking may communicate with R. W. Brock, University of British Columbia, Vancouver.

OBITUARY.

Elias Rogers.

With the death of Elias Rogers there passes a pioneer of the coal trade in North America. Mr. Rogers purchased the first coal mines opened in Jefferson County, Pennsylvania, and in 1876 came to Toronto and established with his brother Samuel the coal business which later became the Elias Rogers' coal company. In 1909, Mr. Rogers became President of the Crow's Nest Pass Coal Company. He died at the age of 70 years. Mr. Rogers was born at Whitechurch, York Co., Ont., and was a prominent member of the Society of Friends.

Correspondence

PETROLEUM HYSTERIA OF E. & M. JOURNAL.

To the Editor of the
"Canadian Mining Journal,"

Sir:

German propaganda and Sinn Feiners machinations are being carried on more actively than ever in the Great Republic to the south of us. Judging from the editorial in the "Engineering and Mining Journal," March 27th, pp. 733-4, even the Editor of your contemporary has been infected with the virus. In his hysterical "The Menace of Britain's Petroleum Policy" and the "Higher Patriotism" he says in part: "In the conduct of which campaign she (Britain) has discriminated against American commercial competitive progress, by laws, regulations, and decisions barring aliens from fields under her control." This statement is remarkable, or shall we say, amusing, when we consider what has long been the law of the United States regarding the staking of mineral deposits. No alien can get title to a mineral deposit in that country, as the following quotation from the American Mining Code shows: "All valuable mineral deposits in lands belonging to the United States, both surveyed and unsurveyed, are hereby declared to be free and open to exploration and purchase, by citizens of the United States and those who have declared their intention to become such . . ." but by no other persons.

Moreover an alien cannot even own a house in his own name in many, if not in all, the States.

Contrast these conditions as regards the treatment of aliens with those that prevail within the British Empire! But probably we have been too lenient and good natured in the past and it is well that we should now take a leaf out of Uncle Sam's book and prevent aliens from getting title to our natural resources, especially those like petroleum that are of both great military and industrial importance. Our friends in the Great Republic need not fear that we have ulterior motives if we are seeking to control the petroleum resources of the Empire. As it was in the last war, so it will be in the future, our Navy will stand for the protection especially of all the English-speaking peoples.

Has old Standard Oil come to life again after its almost complete dismemberment by the United States Government a few years ago? And are some of its hired men joining in the howl with Germans and Sinn Feiners against perfidious Albion?

At the beginning of the Great War one of the most important petroleum companies, although nominally under neutral control, was really enemy controlled and made conditions awkward for the allies. Why should the British Empire in the future not follow the United States example and not permit aliens of whatever nationality to get control of her natural resources?

From the following extract from a recent Press despatch it is evident that more control of the industry by government would do no harm in Britain, and elsewhere—"The present retail price of 3s 8½d a gallon of gasoline—about 90 cents if exchange were at par—compared with the wholesale price of 1s 6.4d f.o.b. at New York, reveals a good deal of profiteering in distribution. . . . The world supply of motor

spirit . . . is virtually controlled by the Standard Oil Company and the Royal Dutch Shell Company.

. . . There is some hope for British consumers in the fact that the Government controls the Anglo-Persian Company, and it is urged that the products be sold at a reasonable figure within the Empire. A recent British government report suggests that the whole question of the production and price of motor spirit should engage the attention of the League of Nations." But, according to the Editor of the "Engineering and Mining Journal," Britain is committing a crime in attempting to control profiteers! He would let the Standard, the Shell, and other concerns run the industry to suit themselves. He would even blacklist American oil geologists who enter the employ of the British! But after all is said we should make allowance for the E. and M. Editor's hysteria. The long drawn out discussion on the Peace treaty at Washington must tend to get on a fellow's nerves. We should remember that our friends are technically still at war.

PHILAMERICA.

April 6th, 1920.

CANADA'S ALLEGED AUTONOMY.

To the Editor of the
"Engineering and Mining Journal,"
New York.

Sir:

The Canadian Mining Journal, in its issue of Jan. 16 commenting upon an editorial which recently appeared in the "Engineering and Mining Journal" on the League of Nations, objecting to the plural vote for the British Empire, remarks that the article "betrays a curious inability to understand the status of Canada." Referring to British colonies for which votes are claimed, our contemporary goes on to say that "each of the peoples so named constitutes a self-supporting, autonomous, sovereign nation, and if this fact is not understood throughout the world, it is only possible to express surprise." The "Canadian Mining Journal" betrays a curious inability to understand the English language when it describes Canada as an autonomous, sovereign nation. Canada went to war automatically as soon as England desired hostilities. Her government pledged aid to the Allies, and preparations for an expedition were under way on an extensive scale long before the assent of the Canadian Parliament was asked as a mere matter of form. During the controversy which ensued the principle that "when Britain is at war Canada is at war" was accepted by all parties with the exception of the Quebec Nationalists. How can a country claim sovereignty and nationhood when it is bound to render military aid to a suzerain power whenever the latter demands it?

Lord Robert Cecil, a prominent advocate of the League of Nations, in a recent speech, displays the same "curious inability to understand the status of Canada" at which the "Canadian Mining Journal" can only express surprise. He is reported as saying that "We could not continue indefinitely the system by which the direction of our foreign policy was exclusively in the hands of the mother country, though any blunder in it might affect the prosperity and possibly the national existence of all parts of the em-

pire." In the face of such an admission the claim that Canada and the other Dominions are entitled to representation in the League as autonomous and sovereign states is preposterous.

PHILLIPS THOMPSON.

Oakville, Ont., Feb. 16, 1920.

Note.—The preceding letter to the editor of the "Engineering & Mining Journal" had been overlooked, but it requires a reply. While we entirely disagree with Mr. Thompson's statement that Canada has in recent years considered herself "bound to render aid to a suzerain power," it should be pointed out that our remarks in the 16th January issue had reference entirely to Canada's new status as a signatory to the Peace Treaty, in which is incorporated the provision for the League of Nations. If there existed any dubiety in 1914 as to Canada's status as "a self-supporting, autonomous, sovereign nation" none exists today, and it was this fact we desired to emphasise. We also understand Lord Robert Cecil's statement to be confirmation of our point of view, namely, that the exclusive direction of foreign policy in the Mother Country has passed away. This is not an "admission." It is weighty enunciation of a new condition. As to the assent of the Canadian Parliament being asked to a declaration of hostilities in 1914, we have yet to learn that the consent of the British House of Parliament was asked. The British Cabinet acted, and so did the Canadian Cabinet. If the Cabinet had not acted "automatically," or, (as is presumably meant) quickly, the Canadian people would speedily have empowered a new Cabinet. If ever there was a spontaneous expression of the popular will it was seen in the manner in which Canada went to war in 1914—Editor.

BOOK REVIEW.

"FURTHER INCIDENTS IN THE LIFE OF A MINING ENGINEER." By E. T. McCarthy.

Mr. McCarthy, the author of this book, is one of the most highly respected and best beloved of that now small number of English mining engineers who studied under Professors Huxley and Tyndall, and who form a genial coterie into which it is a particular pleasure for the engineer, visiting London, to be admitted.

His books, of which this is the second, give an account of his life in most of the mining districts of the world, including Canada, the United States, Mexico, Uruguay, South Africa, Australia, New Zealand, China, Manchuria, Siberia, the Malay States, Siam, Borneo and Japan.

He begins his stories, for the book is a series of more or less disconnected stories, with a trip to Chiapas in southern Mexico and his life for three years as the manager of an isolated copper mine. His staff was small and his men were mostly renegades and murderers who had fled from the more settled parts of Mexico and the Southern United States.

Later he describes another trip to a gold and silver mine in the States of Chihuahua where he stayed for a few weeks as examining engineer.

In 1897 he took charge of Pigg's Peak Mine in Swaziland where he remained with his wife and young son till 1899, when in spite of contrary instructions from his directors in England, and of objections and discouragement on every side, he closed the mine and fled with the men, women and children who would

go with him, to Lorenzo Marques on Delagoa Bay, whence he took ship to England. Three days after he left the mine, the Boers in South Africa opened active hostilities against the British, took possession of this property and took away the few men, who had insisted on remaining at it, and forced them to march hundreds of miles across country to Pretoria.

Most of the rest of the book is taken up with the author's life in the far east, including China, Japan, Malay States, Siam, Perak, Borneo and Korea. Afterwards he made several visits to the Spassky and Atbascair Copper Mines, as well as to many other places in Siberia, while the final short chapter is devoted to brief notices of two visits to Porcupine, in Northern Ontario, one after the great fire in 1911 and the other in 1914, just on the outbreak of the War. On the latter occasion he was accompanied by Mr. Edward Hooper, and shared the hospitality of our fellow Canadian Dr. J. Mackintosh Bell.

The book is dedicated to the memory of his wife, whom he found very ill when he returned from Canada and who shortly afterwards died. His tribute to the memory of his wife, who was his heroic companion throughout his travels, is very touching and pathetic. She had helped him to make a home wherever he went, both for his own family, and for the mine staff working under him.

The book is not only the account of the life of a mining engineer, it is the story of the doings of a forceful Englishman who has roamed over the world, and has helped to develop its resources, partly for his own benefit, but mostly for the benefit of humanity at large, for whoever induces the earth to increase its yield, whether of grain for food, or of metal for implements, etc., is advancing the cause of civilization and progress. He pushed civilization a little further forward by his ability and capacity for work and by his willingness to undergo hardship and privation for the sake of successful accomplishment. As long as the British race is dominated by the spirit that prevades this book, no matter how gloomy the immediate outlook, there need be no fear of its ultimate success.

The book should be read by all mining engineers and should be used as a text book in the mining courses of schools and colleges, for it indicates to all who contemplate entering the profession the trouble, labour, vicissitudes and pleasures that pave the way to a successful career.

As in the case of the former volume any profits that may be derived from the sale of the book have been generously devoted by the author to St. Dunstan's Hostel for the Blind.

Toronto, April 7th, 1920.

—J.B.T.

NEW MINING COMPANIES.

Recent mining company incorporations announced in the Ontario Gazette are: King Kirkland Gold Mines, Limited, with a capital stock of \$2,500,000; the Gowganda Engineering and Construction Company Limited, head office Toronto, authorized capital \$40,000. Silbar Cobalt Mines, Limited, head office Toronto, authorized capital \$1,500,000. Federal Feldspar, Limited, chief place of business, Ottawa, capital stock, \$40,000. Kitchener Kirkland Mines, Limited, head office, Kitchener, Ont., authorized capital \$3,000,000, provisional directors, H. O. Feick, C. A. Imerson, R. O. Kleinschmidt, C. W. Feick and G. E. Chapman.

The Department of Mines of Canada, its Organization and its Work.

The Department of Mines of Canada, as at present constituted was created by an Act of the Parliament of Canada assented to on the twenty-seventh of April, 1907. Although the Department has been in existence over twelve years, the plan of organization and the functions of the two branches and other subdivisions are matters not clearly understood, even by many in Canada who are closely associated with the mining industries and with the work of the departmental staff. The present article is intended to place before the readers of this journal a concise and accurate statement of the present organization and functions of the department as defined by the statute under which it was created. A brief historical sketch of the more important events which led to the organization of the department is included.

The Geological Survey of Canada, the forerunner of the present Department of Mines, first constituted in 1842, was organized only after some ten years' active propaganda on the part of interested persons. During its early years, the work of the survey was confined largely to general scientific geologic work, much of which had, however, an economic bearing. The investigations embraced only parts of the provinces of Ontario and Quebec, which then constituted Upper and Lower Canada. After confederation (1867) its work was extended to include the Maritime Provinces and, later, the whole of western Canada, and this with only a very slight increase of staff at that time.

During the next interval of a little more than two decades, general areal explorations were carried on in various parts of Canada; a few men inadequately equipped were required to explore the vast domain of half the continent.

In the early eighties of the last century, persons who were immediately concerned in the development of the mineral resources of Canada began to importune the government of the day to give more attention than had been given in the past to the collection of statistical and other information relating to these resources and to the mining industries of the country. The matter also seems to have been a subject of discussion among the interested members of the British Association for the Advancement of Science, which met in Montreal in 1884, for we find that members of this association, at this time, strongly urged that prompt steps be taken to supply this want. Two years later, in 1886, a strong and influential deputation of mining men and others interested in mining, representing all parts of Canada, waited on the Minister of the Interior, with a request that a "Bureau of Mining and Mineralogy" be established. Their memorial reads as follows:

Whereas, it is believed that the information and statistics regarding mining and mineral developments in Canada furnished by the Dominion Government are not in keeping with the desire of those interested in such developments, and are neither sufficient nor accessible enough to supply the public with full, authentic and prompt information on these subjects; we do, therefore, wish to respectfully bring to the attention of the government the following desires of a section of our community:

1. To have full and reliable information of the mining and mineral developments, and statistics connected therewith, for the whole Dominion, published each year, as soon after the end of the year as possible.

2. To have a medium through which information relating to our miners in all parts of Canada can be given to the public—such medium to be a monthly publication.

This would have a tendency to bring our mining industries constantly before the public and to educate them to take an interest in sound and legitimate mining enterprises, besides giving to the world at large constant information about mineral development in Canada compiled from records and reports of a mining bureau under government control which would be authentic and reliable.

This memorial contained five numbered suggestions, the first and most important of which reads as follows:

That a mining and mineralogical branch of the Geological Survey be established which will publish its reports separately and annually, such a branch to be presided over by an independent officer.

These recommendations seem to have been accepted and acted upon, for in the following year, 1887, was published a report entitled "Statistical Report on the Production, Value, Exports, and Imports of Minerals in Canada, during the year 1886 and previous years," the first report of its kind. Subsequently, a special Mines Section of the Geological Survey in charge of Mr. Elfric Dient Ingall, who is still a member of the Geological Survey, was organized to collect and publish information of this character.

Statistics and the various methods of compilation seem always to be a bone of contention and Canadian mining statistics have been no exception. Again, the rapid expansion of the country create new demands. In a new country, such as Canada, with her vast extent of territory, largely unexplored, where new industries are constantly being organized to exploit her natural resources, the demands upon the government for information and assistance in the establishment of these industries are both insistent and persistent. There are many enterprises where technical knowledge and skill are required, more especially in the initial stages, and there are many occasions where a paternal government can, in various ways, assist its constituents with technical information. Even after the organization of the Mines Section of the Geological Survey, these matters of statistical information and of more direct aid to mining industries of the country became matters of frequent discussion among mining and others associated with the industry.

These discussions seem to have culminated in the passing of the following resolution at the Montreal meeting of the newly organized Canadian Mining Institute in 1900.

Resolved that the Canadian Mining Institute in annual session assembled desires to direct the attention of the federal government to the magnitude and importance of our mining industry which during recent years has developed so rapidly and respectfully urges an increase of government aid wherever possible and the establishment of a strong and practical Department of Mines or of a department which shall be devoted to the interests of the mining and metallurgical industries and which shall include the Geological Survey and all other necessary branches.

This resolution when presented to the government, was also accompanied by a statement and recommendations with reference to the establishment of the proposed Bureau or Department of Mines, as follows:

It requires an independent head, which, while responsible to a minister, should be practically free from political control, and administration entirely on a non-partisan basis.

Should be divided in three main divisions, viz.,

- (1) A Geological Survey,
- (2) A Mining and Technical Branch,
- (3) A Statistical Branch.

1. The present survey to be reorganized and the different branches separated so as to avoid confusion; e. g., a Topographical branch, which would greatly expedite the work of another branch, viz., the Geological branch proper. There also should be divisions to include petrography, chemistry, palaeontology, etc.

2. The mining and technical branch should deal with inspections and reports concerning the economic possibilities of districts already discovered, and of regions yet to be explored. Monographs on various localities, industries, processes and methods should be issued frequently. This branch also should deal with questions of production, transportation and cost. If possible, the head of this division should be an experienced and practical (if not practising) mining engineer.

The difficulty of obtaining such a man leads to the suggestion that the head officer of this bureau should have a list of competent engineers who are authorities in the different fields or branches of the profession, who should be called upon, when required, to report upon special subjects or special operations, at the discretion of the head officer, or when demanded by the public interests.

3. Statistical work is rendered necessary by the different ways and units employed at present by the different provinces of the dominion, and by the fact that existing statistics from any department of the Government are not inclusive of all the information that is available on any one material or subject.

It happened that some years previously, as a result largely of informal discussions and interviews, this question of the establishment of a Department of Mines had already been favorably considered by a responsible minister of the Crown. We find that a few months after the resolution above quoted was presented to the cabinet an Order in Council was passed making a new appointment to the position of Superintendent of Mines, an office in the Department of the Interior which had been created nearly thirty years previously. The first duty assigned to this officer was the establishment of the Dominion Government Assay Office at Vancouver. In the following six years a number of technical reports on mining subjects were prepared and published under the direction of this officer. The most important work undertaken during this period was probably the investigation of the processes of Electric Smelting of Iron Ores in Europe, followed by the experimental work under government auspices in electric smelting of iron ores at Saulte Ste. Marie. Another important innovation was the introduction of the Swedish methods of magnetic surveying for exploring Canadian magnetite deposits, and the publication of a monograph on "Magnetometric Methods of Surveying."

During this period, we find an anomalous state of affairs in the organization of the governmental service for investigating mines and mining. The original Department of the Geological Survey, one branch of which was engaged in special investigation of mining matters, were presided over by the Minister of Interior. Under this same minister, in the Department of the Interior, was a Technical Branch, controlled by a Superintendent of Mines and a third branch called the Mines Branch,* also existed, in which was vested the control of mineral lands belonging to the Crown.

It was not until the end of the year 1906 that the

* At the present, the branch of the Department of the Interior is called "The Mining Lands and Yukon Branch," the chief administrating officer is Mr. H. H. Rowatt.

government decided to further accede to the wishes of those interested in the mining industry, as made known to it both by the resolution of the Canadian Mining Institute, and independently, by individuals and corporations. On the twenty-seventh of April, 1907, the statute now in force, entitled "An Act to Create a Department of Mines" (6-7 Edward VII., Chap. 29), became law. In general principles this Act embodies all the recommendations contained in the resolution of the Canadian Mining Institute, presented to the government six years before.

The principal clauses of this statute are as follows, the numbers being those of the original Act:¹

1-2. Include merely the short title of the Act and certain definitions.

3. Establishes "The Department of Mines under the control and management of a Minister of Mines."

4. "The department shall administer all laws enacted by the Parliament of Canada relating to mines and mining,² and shall also have the management and direction of all subjects assigned to it by the Governor in Council."

5. "The department shall consist of two branches, one of which shall be called the Mines Branch, and the other of which shall be called the Geological Survey."

6. "The functions of the Mines Branch shall be: (a) to collect and publish full statistics of the mineral production and of the mining and metallurgical industries of Canada, and such data regarding the economic minerals of Canada as relate to the process and activities connected with their utilization, and to collect and to preserve all available records of mines and mining works in Canada; (b) to make detailed investigations mining camps and areas containing economic minerals or deposits of other economic substances, for the purpose of determining the mode of occurrence, and the extent and character of the ore-bodies and deposits of the economic minerals or other economic substances; (c) to prepare and publish such maps, plans, sections, diagrams, drawings and illustrations as are necessary to elucidate the reports issued by the Mines Branch; (d) to make such chemical, mechanical and metallurgical investigations as are found expedient to aid the mining and metallurgical industry of Canada; (e) to collect and prepare for exhibition in the Museum specimens of the different ores and associated rocks and minerals of Canada and such other materials as are necessary to afford an accurate exhibit of the mining and metallurgical resources and industries of Canada."

7. "The functions of the Geological Survey shall be: (a) to make full and scientific examination and survey of the geological structure and mineralogy of Canada; to collect, classify, and arrange for exhibition in the Victoria Memorial Museum such specimens as are necessary to afford a complete and exact knowledge of the geology, mineralogy, palaeontology, ethnology, and fauna and flora of Canada; and to make such chemical and other researches as will best

¹ It has not been thought necessary to publish the statute in detail; only those clauses which explicitly define the functions of the various branches of the service and the scope of their investigations are here reproduced.

² This clause has never been put into force.

tend to ensure the carrying into effect the objects and purposes of this act; (b) to study and report upon the facts relating to water supply for irrigation¹ and for domestic purposes, and to collect and preserve all available records of artesian and other wells; (c) to map the forest areas of Canada, and to make and report upon investigations useful to the preservation of the forest resources of Canada,² (d) to prepare and publish such maps, plans, sections, diagrams and drawings as are necessary to illustrate and elucidate the reports of surveys and investigations; (e) to carry on ethnological and palaeontological investigations."

8. "The department shall maintain a Museum of Geology and Natural History for the purpose of affording a complete and exact knowledge of the geology, mineralogy and mining resources of Canada."

9. "The Governor in Council may appoint a Deputy Minister, a Director of the Mines Branch, a Director of the Geological Survey, and such other officers and clerks as are required for the proper conduct of the business of the department, who shall be appointed and classified under schedule A of 'The Civil Service Act,' and in accordance with and under the terms of section 6 of the said Act."³

10-19. Deal with internal affairs of the department, appointments, restrictions, equipment, and annual summary reports.

20. "The minister may cause distribution to be made of duplicate specimens to scientific, literary and educational institutions in Canada and other countries, and also authorize the distribution or sale of the publications, maps, and other documents issued by the department."

21. "The minister may, for the purpose of obtaining a basis for the representation of the mineral, mining and forestry resources and of the geological features of any part of Canada, cause such measurements, observations, investigations and physiographic, exploratory, reconnaissance surveys to be made as are necessary for or in connection with the preparation of mining, geological and forestry maps, sketches, plans, sections or diagrams."

22. "Chapter 65 of the Revised Statutes, 1906, is repealed."

During previous years, several statutes and amendments thereto had been passed, establishing the Department of the Geological Survey and defining its functions. These various statutes were subsequently consolidated and revised, appearing as Chapter 65 of the Revised Statutes of Canada. Section 22 of The Geology and Mines Act, 1907, specially repeals the statutes, and section 5 constitutes the Geological Survey Branch of the Department of Mines. The purpose of this change appears to have been to avoid having two deputy ministers administering small depart-

¹ These duties are performed in part by the Dominion Water Power Branch Department of the Interior, of which Mr. J. B. Challies is the present Superintendent.

² These duties are not performed by the Geological Survey, but by the Forestry Branch Department of the Interior, of which branch Mr. R. H. Campbell is Director.

³ The present Deputy Minister is R. G. McConnell, B. A. The present Director of Mines Branch is Dr. Eugene Haanel.

ments whose work was closely related, and to avoid a continual overlapping of work, which would lead not only to confusion but to waste of time and effort and loss of efficiency.

A comparison of sections 6 and 7 of the act, quoted, will show that in general the Mines Branch of the Department of Mines is concerned with technical problems and with the detailed investigation of mining properties, while the more purely scientific and geologic investigations and the exploratory work are assigned to the Geological Survey Branch.

The department is administered by a deputy minister, acting under the Minister of Mines. Directly under the deputy is a staff of 17 which includes the editor's branch and the accountant's branch neither of which is constituted as a special branch of the Department of Mines by the statute. The technical work of the department is carried on, under the administrative head, by the two principle branches of the department, the Mines Branch and the Geological Survey Branch. The work of each of these branches is controlled by principal technical officers, who are termed respectively the Director of the Mines Branch, and the Director of the Geological Survey Branch.

MINES BRANCH

The Mines Branch, as at present constituted, is divided into the outside and the inside service, both services being administered by the Director of the Mines Branch. The Dominion Government Assay office at Vancouver is attached to the outside service of this Branch: the inside service, with headquarters at Ottawa, is organized for administrative purposes into the following divisions, each with a chief technical officer and such additional staff as has been provided:¹

- Administration and Library Staff.
- Metal Mines Division.
- Non Metal Mines Division
- Fuel and Fuel-Testing Division.
- Ore Dressing and Metallurgical Division.
- Ceramic Division.
- Roads Material Division.
- Chemical Division.
- Mineral Resources and Statistics Division.

The civil estimates for the fiscal year 1919-20 provide for a staff of 63 exclusive of the Assay Office at Vancouver.

Outside Service. The Dominion Service Assay Office at Vancouver was established at that point to purchase and market gold from Yukon, British Columbia, and adjacent territories. The officials employed in this office number ten, in addition to the Director.

The various Testing laboratories at Ottawa require the services of a number of employees, which include technicians, skilled mechanics, and labor. These employees are also classed in the outside service. Their numbers vary from time to time. The Summary Report of the Mines Branch for the year 1916 gives 23 names on this staff.

Inside Service. The inside service of the Mines Branch has its headquarters in Ottawa and is compris-

¹ Compare Summary Report of the Mines Branch, 1916, p.1.

ed of those employees who are on the permanent staff. The estimates for the last fiscal year, as already noted, provide for a staff of 63 persons. Field officers of the Mines Branch also very frequently engage additional temporary assistance, but no statement of the number of persons employed on this service from year to year has been published in the annual reports.

Geological Survey Branch

The Geological Survey Branch of the Department of Mines, as constituted in 1913, was organized as follows under the Director of the Branch.¹ No essential changes are noted in this organization in the Summary Reports of recent years.

Administrative Division.

Geological Division.

Topographical Division.

Biological Division.

Anthropological Division.

Draughting and Illustrating Division.

Photographic Division.

Library.

This branch also undertakes the work of collecting and caring for material for the Victoria Memorial Museum. The Civil Estimates for the last fiscal year, 1919-20, provide for a permanent staff of 141 persons. During the field season it is customary to engage the services of a number of independent scientists, usually members of the several University Staffs. The field parties of the Geological Survey are also provided with such labor as may be required. The number of persons employed in their several capacities on outside temporary service of this character varies from year to year. The annual summary reports do not contain any statement showing the size of the extra staff employed upon field service by the Branch.

Explosive Division

Provision was made in 1914, by Act of Parliament, for the regulation of the Manufacture, Testing, Storage, and Importation of Explosives. (Chapter 31, 4-5 George V). The Explosives Act was put into effect by proclamation on Mar. 1st, 1920 as provided in clause 27 of the Act. Originally it was planned to have this Act administered under an Explosives Division of the Mines Branch. This plan has not been carried out. An Explosives Division has been organized in association with the administrative staff of the office of the Deputy Minister. The staff of this Division, as at present constituted, comprises four technical officials and two clerks. It is stated, non-officially, that it is proposed to constitute this Division as a separate Branch of the Department of Mines, but no provision for the creation of such a branch appears in the Mines Act or in the Explosives Act.

General Considerations

The Civil Estimates for the last fiscal year (1919-20) provide for a permanent staff of 222 persons in the Department of Mines at Ottawa exclusive of the newly organized Explosives Division. The total salary vote for this service was \$422,747. This amount does not include the salaries of persons employed on temporary service or those in the so-called outside service. The remuneration for these services is provided in other votes.

¹ The Summary Report of the Geological Survey, 1913, p.1.

The average salary provided is at the rate of \$1,904 per annum. The Mines Branch vote was \$123,362, providing an average salary of \$1,955 for the 63 Employees of that Branch. The Geological Survey vote was \$265,722, providing an average salary of \$1,884 for the 141 employees of this branch, the lower average being due to the larger proportion of clerical service provided.

The technical employees of this Department are grouped chiefly in the two upper divisions of the classification in effect at the time these estimates were provided. The Mines Branch estimates provide for 51 employees in the two upper divisions, with an average salary schedule of \$2,158 and a total vote of \$110,037. The Geological Survey vote provided for 109 employees in the two upper divisions, with an average salary schedule to be \$2,156 and a total vote of \$235,060. It is therefore to be inferred from these averages that the technical staffs in both branches of the service are paid on practically equivalent scales.

The maximum salary paid in the Department, exclusive of that paid the three chief administrative officers is \$3,700. There are four officials in the Geological Survey on this rating. The maximum in the Mines Branch is \$3,500. The salary of the Deputy Minister of the Department is \$6,000 per annum and is not included in the above averages. The salary of the Directors of the two Branches (Mines \$4,000, Geological Survey, \$3,800) are included in the averages.

Finally it is to be noted that in the case of all appointments made since 1896, which includes nearly all the staff with the exception of a few of the higher paid officials in the Geological Survey, five percent of the nominal salaries as given here is not paid to the employees, this amount being retained for a fund not under the control or available to the employees, and known as the Retirement Fund. The actual salaries paid, and available to the employees to meet the costs of living are only 95 per cent of the amount given in the greater number of cases.

GEOLOGISTS LEAVE THE CIVIL SERVICE

Whitehall Petroleum Co. and Universities Take Three Men

Dr. E. L. Bruce, geologist in charge of work in northern Manitoba, has tendered his resignation to the director of the Geological Survey in order to take a position for the summer with Whitehall Petroleum Co., before accepting the professorship in mineralogy at Queen's University, Kingston. The tremendous development taking place in the recently discovered mineral district north of The Pas has been greatly assisted by Dr. Bruce's timely reports and maps.

Dr. F. J. Alcock, who for a number of years has likewise been working in northern Manitoba and Saskatchewan, is also considering an offer of employment with Whitehall Petroleum Co.

It is announced that Dr. S. J. Schofield, who has had 13 years experience in British Columbia, is leaving in the fall to accept a professorship in geology at the University of British Columbia.

Report on the Metalliferous Mines of Nova Scotia

(Prepared by G. F. Murphy, and abstracted from the Mines Report for 1919.)

Serious Condition of the Gold Mining Industry.

The tremendous rise in the cost-level of labour and materials in the last few years has effected the gold-mining industry by causing a rising in the cost of production which, due to our monetary system, can not be balanced by a proportionate rise in the price of the product.

In Nova Scotia, where gold mining has been struggling for a number of years, this added burden has made profitable mining almost impossible. There were only three companies that carried on any regular mining operations throughout the past year, and in the case of at least two of these, I have reasons to believe that operating expenses were at least five times the value of the gold recovered. Therefore, their hope lies in the value of the product being increased by some means at present not apparent, or something done to reduce the cost of production. This seems more apparent when we remember that practically all the larger undertakings in past years, when operating costs were only half what they are today, failed badly. Many of these undertakings were no doubt, mismanaged and exploited without any sincere effort to make the venture pay, but all mismanagement has been discontinued in recent years by the increase in the cost of operation.

I have examined a statement of expenses of one company operating last year. These figures show that it has cost them—\$13.00 per ton for rock, broken or \$207.00 per ton of ore milled—50 per cent. of total expenditure went in wages and 16 per cent. for fuel. The value of the ore was \$40.00 per ton. These figures may not be altogether reliable as their tonnage is usually estimated, nor do I think this is a fair average of the cost of mining in Nova Scotia, but the figures can be used to compare with the cost of mining in Northern Ontario, where the total cost per ton of ore milled is as low as \$5.00

The great increase in cost in Nova Scotia per ton milled over per ton of rock broken, as noted in the above figures, is due to our narrow veins. In the mine referred to above, it is estimated that it is necessary to break 16 tons of rock to secure one ton of ore. This ratio would be a fair average for the entire province and is a difficulty with our gold veins that is seldom realized.

The question that naturally arises is what can be done to revive this industry, once an important source of revenue to the province.

The diamond drill has been used to great advantage in the development of the gold mines of Northern Ontario and other mining camps, and might be used to stimulate mining operation in some of our gold mining districts. Our irregular ore bodies with their many rolls and enrichment zones, are not as well suited to drilling operations as the large, regular ore bodies of Ontario; but there are many cases where drilling could be used to advantage in proving the existence of veins, especially those where the value is known and the lead has been lost by faulting, or in districts like Killag, where prospecting, on account of the heavy drift, is very expensive and uncertain.

Many reasons have been given for the present condition of our gold mining industry and a consider-

ation of them, no doubt, will help to guide future efforts, but I think that the important thing at present is to find a means of reviving the industry. I believe that we must realize that our gold mines must be worked on a small scale. That is, that only the enriched portions will pay to mine, more especially is this true with the increased cost of mining. It naturally follows therefore, that the building of elaborate plants must be discouraged, as our mines can not pay a large overhead-charge.

A difficulty at present is a scarcity of labour. Mines that are prepared to pay the prevailing wage cannot obtain miners, as only those remain in the districts who, due to family ties, could not move out. This, of course, will right itself eventually.

The fuel question is serious. Wood, the fuel that was chiefly used, has become very scarce in close proximity to the mines, and with the high cost of labour it is no longer a cheap fuel. The result is, not one of the mines operating at present is using it, but for the most part, have substituted oil engines. Coal, on account of transportation difficulties, is usually out of the question.

The only solution for this problem is to supply the mines with hydro-electric power. If, through the efforts of the Government, cheap power could be supplied, one of the chief difficulties in the way of successful gold mining would be removed.

I would therefore strongly recommend that the Government give the gold mining districts special consideration in their water-power project. Also give every aid to prospecting. Human nature will provide the incentive, and the search for gold will go on. Let the industry stand or fall on its own merits, its history in the past has been too tragic to be repeated.

The following is a list of the companies or individuals who have been mining during the last year:

Sherbrooke Mines & Power Co., Goldenville, Guysboro Co.

Montagu Goldfields, Ltd., Montagu, Halifax, Co.

H. F. Ross, Caribou, Halifax Co.

Caribou Gold Mining Co., Caribou, Halifax Co.

Alex. Greenough, Oldham, Halifax Co.

John Greenough, Oldham, Halifax Co.

Harry Ferguson, Oldham, Halifax Co.

John Hyland, Fairview, Halifax Co.

W. P. C. Inglis et al, Mt. Uniacke, Hants Co.

M. J. O'Brien, Renfrew, Hants Co.

Great Canadian Gold, Consolidated, Malega, Queens Co.

D. M. Thompson, Mill Village, Queens Co.

Scheelite Mines, Ltd., Scheelite, Halifax Co.

Malagash Co., Malagash, Cumberland Co.

Consolidated Manganese Co., New Ross, Queens Co.

The Malagash Salt Deposit, Nova Scotia.

The Annual Report of the Mines Department of Nova Scotia has the following reference to the Malagash salt deposit, to which previous references have been made in the "Journal":

As development proceeds in the Malagash salt deposit, more definite information is obtained. Last year's report mentioned that bore holes had tended to prove the existence of 600 square feet of salt-bearing

strata; at the close of 1919, drill holes had revealed the presence of brine underlying an area of about 5,000 square feet.

Messrs. Chambers and McKay continued the development during the whole of 1919, have sunk the shaft referred to in last year's report 33 feet farther or to a total depth of 118 feet, and had at close of year driven a tunnel north from the bottom of the shaft 20 feet into the salt strata. The salt extracted from the workings has been of a satisfactory character.

Evidence obtained from the bore holes and shaft, seem to indicate that the overlying 85 feet which is horizontally stratified, is made up of material derived from rock associated with salt that went into solution, and that below that plane the strata assumes the dip and strike found in the surrounding rocks that have been examined.

The structure of the main body of rock in the area is that of an overturned anticline, and the deposit lies in the northern limb with a south dip. Assuming that salt underlies wherever brine was encountered in the bore holes, there is space for a thickness of about 350 feet of salt strata with a dip of 35 degrees.

As the salt was doubtless formed in a basin-shaped body of water, it is reasonable to expect that a thickness of 350 feet must have had considerable lateral extent and that therefore, unless a great deal has been eroded, the salt must extend to considerable depth. The direction of the bedded strata is that of the belt of lower carboniferous rock that extends across the country from Malagash Point away towards Cumberland Basin. It is also reasonable to expect a continuation of the salt bearing strata in that direction. The surface features around the salt deposit are also suggestive of lowering, owing to underground material going into solution.

It seems, therefore, that the conclusion that there are millions of tons of salt present in the deposit, is quite a justifiable one. The presence of potash salts in the deposit is also a matter of great importance.

NOVA SCOTIA NOTES

Labor Matters at the Coal Mines

The Board of Conciliation which considered the wage questions at issue between the Nova Scotia Steel Company and its mine employees has recommended a higher scale of wages. In recommending the increase the Board explains that its suggestions of increase are not as large as it would have preferred to make them, but in view of the difficulties under which the Scotia mines are operated, in comparison with competing companies, the Board believes that the granting of rates as high as are paid in competing mines would necessitate the entire or partial closing down of the Sydney Mines collieries.

The Conciliation Board makes a suggestion of similar bearing to that made by the Fuel Controller in his final report, namely, that the Government Railway should contract to take a certain quantity of coal over a period of four or five years ahead. This has particular reference to the Jubilee mine, the coal from which is unsuited for some purposes, but has been largely used as locomotive steam coal on the Government Railway for some years past. If the company were able to count upon a definite outlet for Jubilee coal, the systematic arrangements for working the mine and assuring continuous employment could be made.

The Conciliation Board which sat at Inverness Colliery has also made its report, and recommends certain wage increases.

The United Mine Workers have been in convention at Truro, N.S., during the week beginning April 5th.

The Wage Committee recommends that a demand be made for a 27 per cent increase in wages to date from the first of May, 1920, which shall be cumulative upon and in addition to the general increase in wages granted at the first of the year. This increase was made the subject of a yearly agreement, which provided for revision at the end of each four months should the cost of living and other economic conditions have altered the relative status of wages and living costs.

The new increase is asked for as a result of the recent 27 per cent increase obtained by the United Mine Workers in the bituminous coalfields in the United States. As has been previously pointed out, it was agreed between the coal operators and the United Mine Workers at the beginning of 1918 that wage conditions in the United States should specifically not be taken as a basis of wage demands in Nova Scotia. In view of this agreement, and the general increase obtained January 1st, the recommendation of the Wage Committee that a further 27 per cent be asked was unexpected and will doubtless be vigorously combatted by the operators.

The Department of Labor announces that future Boards of Conciliation will be so arranged as to permit of simultaneous dealing with similar wage questions in one district. This is presumably to avoid such long-drawn out negotiations as have taken place in Nova Scotia since the first of the year, where it has not been possible to adjust the wage conditions in one district until another district had been dealt with.

The Convention was marked by reaction from the Winnipeg strike and the O. B. U. movement in the western collieries in District 18. While the Convention as a whole was distinctly opposed to the O. B. U. idea, there was evidently a minority in favor of it. Much discussion was caused by the reading of a confidential letter from the Minister of Labor pointing out the dangers and the unwisdom of the methods of the O. B. U. J. C. Watters said that to go over to the O. B. U. would bring chaos and disaster to Nova Scotia, and he advised adherence to the United Mine Workers, a sentiment that met with almost unanimous approval. The criticism of those who favored the O. B. U. side of the western controversy was directed against the limitation of individual action which had been enforced upon O. B. U. members by the "closed-shop" and "check-off" system compulsory in the mines of District 18.

The Late Edward Hall Carter.

The death took place in Toronto on April 18th at his residence in Toronto of Edward Hall Carter who for some years had been prominent in mining circles both in Ontario and British Columbia, where he was manager for several years of a gold mine in Yellowstone, and afterwards Inspector of Mines for Ontario from 1900 to 1906. The late Mr. Carter was also one of the geological party which drew the dividing line running from Lake Superior to the Hudson Bay between the Provinces of Ontario and Quebec. He won the gold medal at Bishop Ridley College and graduated from the University of Toronto as a Bachelor of Applied Science. He was a member of the National and Royal Canadian Clubs, and is survived by his wife, and four sons.

Northern Ontario Letter

THE SILVER MINES

Emphasis is placed on the importance of local silver refineries by the absence during the last week of March of any ore shipments from Cobalt. It demonstrates in a conclusive way the fact that an increasing percentage of the product of the mines of Cobalt is being refined at home. The great volume of white metal now goes out in silver bars in express cars, rather than the old expensive method of shipping the ore in its crude state with its thousands of tons of accompanying rock.

Silver quotations appear to have again become quite steady at a point not far below a parity with gold at 16 to 1. At such a price the mines are pushing operations to the maximum of capacity, and in the case of the leading producers the treasuries are literally building up cash. The companies for the greater part welcome this opportunity to strengthen their treasuries, in that some of the mines are growing old, and in order to perpetuate the prosperity accruing to the shareholders, new productive mines must be developed or purchased. To do this successfully, a substantial treasury is invariably necessary.

According to the belated annual statement of the Beaver Consolidated Gold Mines, the Company treated a total of 26,974 tons of ore during 1919 and recovered 301,781 fine ounces of silver. The total cost of mining, milling, administration, taxes, depreciation development, exploration and repairs amounted to only \$7.41 for each ton of ore treated. Despite the loss of time caused by the 7-week labor strike, as well as the influenza epidemic, the net profit on the year's operations amounted to \$158,215, as compared with \$168,642 in the previous year. Broken ore reserves total 25,696 tons in which the silver content is estimated at ten ounces per ton. In addition to this is \$73,892 in ore ready for shipment, plus a large tonnage of low grade material not included in the estimates. On the whole, the physical condition of the Beaver appears to have been strengthened during the year. As regards the financial statement, a surprise of \$1,049,080 is shown. In a sense, however, this is yet largely on paper. For instance, \$362,261 is shown as shares in the Kirkland Lake Gold Mines, while \$404,726 appears in bills receivable, this being money advanced to develop the Kirkland Lake Mine. The latter property is referred to again in this summary under the "Gold Mines" heading.

The Kerr Lake Mines have issued an interim report which promises to meet with general satisfaction, not only for the reason that it shows candour to the shareholders, but has several favorable features, not the least of which is the fact that a majority interest has been acquired in a Utah silver mine, and also a gold dredging property in New Zealand. The official statement follows:—

"Recent important acquisitions have been made for your company, and in order that you may be fully informed, the following interim statement is submitted covering the six month period ended February 29, 1919.

"As you have been previously advised, no definite life can be estimated for your property at Cobalt, and in view of this, it has been deemed advisable to prosecute a vigorous search for new mining ventures in which to employ the company's large cash resources.

"After due consideration and careful examination by competent mining engineers, a majority ownership has recently been acquired in a silver mine in Utah, and also in a gold dredging property in New Zealand. Further than this, your properties in Cobalt have been operated with little interruption and a satisfactory output has resulted therefrom.

"The Utah property referred to has recently been equipped and entered upon the productive stage in December, 1919, the mill having a capacity of 150 tons a day. The ore reserves of this mine stand at the present time at 87,000 tons, averaging 18 ounces of silver and 80 cents in gold. The productive limestone extends over a mile across the property, and approximately half this length on the surface shows an outcrop similar to that above the ore thus far developed. Only a small percentage of the total mineralized area has thus far been prospected, and the best geological opinion indicates the possibility that very many times the above tonnage will be developed.

"Taking silver at \$1.10 per ounce, which is a price substantially lower than now ruling, it is estimated that a net profit of approximately \$9.50 per ton will result from this ore. Thus the share of the Kerr Lake Mines in the annual earnings of the Utah property alone, after the repayment out of earnings of certain advances made on the purchase price of the property, is estimated at \$265,000, equivalent to about 45c. a share on its issued capital. Very favorable reports were made by the engineers who investigated the New Zealand property. The ground has been exhaustively tested and it is estimated that the area thus far drilled will net a profit of \$3,436,000 after deducting cost of property and equipment. It is estimated that the annual income accruing to Kerr Lake through the two-thirds interests in this property, will amount to approximately \$287,000 or approximately 50 cents a share. The equipment of this property with a dredge is now in process and should be completed by spring of next year."

In regard to the Kerr Lake Mine, itself, the report says:—

"The developed ore reserves as of August 31st, 1919, were reported at 500,000 ounces. Further underground work during the period produced additional ores with the result that the actual production for the six months ended February 29th, was 610,231 ounces. No accurate estimate of present reserves can be made, but it is expected that your Cobalt mine will continue to be productive for a considerable time. The production for the first two months of 1920 amounted to 213,234 ounces.

"Besides the money already invested in the new properties above referred to, your company had on hand as of February 29th, 1920, in cash and Government securities alone, \$2,415,027, or slightly in excess of \$4 per share on the outstanding capitalization."

During the month of February the Kerr Lake Mine produced between 99,00 and 100,000 ounces of silver valued at \$135,000, made up of silver at \$1.25 an ounce plus the premium on New York exchange.

During 1919 the Trethewey mine produced \$169,294, as compared with \$254,038 in the previous year. The net for the period amounted to \$31,814. In January, 1920, the company sold its Cobalt mine for \$100,000, as reported at that time in the "Journal." The annual statement declares that the \$100,000 thus received will finance the development of the company's recently purchased Castle property in Gowganda, if needed, but that at present the property has already been brought to almost a self-supporting basis. The report deals optimistically with the outlook at Gowganda.

The McKinley-Darragh financial statement for the first quarter of 1919 is very favorable, showing a total of \$474,864.39, made up as follows:—

Cash in Bank	\$203,594
Canadian Victory Loan Bonds	100,000
Ore in Transit and at Smelter	127,700
Ore at Mine Ready for Shipment	43,570
	<hr/>
	\$474,864

The McKinley plans to also start up its big oil flotation plant about May 1st.

An injunction has been issued restraining the La Rose from purchasing the minority interest of the University property. It holds good for three weeks.

It is reported that the Peterson Lake has made arrangements to have the Dominion Reduction Company treat its tailings pile, the arrangement having the appearance of being likely to result in a moderate profit to the Peterson Lake.

Water trouble caused at the Cross Lake property by rising water in Cross Lake are being overcome, and work will soon attain normal proportions.

At Gowganda, the Reeves-Dobie company is making arrangements to install additional grinding equipment in its mill, with which it is hoped to place the property on a profitable producing basis.

During the month of March, the Nipissing Mining Company produced \$384,723, or an average of \$12,410 every twenty-four hours. This compares with \$329,401 in February and \$423,139 in January. The output for the first quarter of 1920 amounted to a total of \$1,137,263 and is at the rate of \$4,549,052 a year, thus once more setting the highest record in the history of the Nipissing Mine, which company since 1904 has produced over fifty-seven million ounces of silver bullion valued at not far under forty million dollars.

In his regular monthly report to the President and directors, Hugh Park, manager, says:—

"During the month of March the Company mined ore of an estimated value of \$384,723 and shipped bullion from Nipissing and customs ore of an estimated net value of 136,771.

"General underground development at all shafts continued to be favorable during the month. Two small veins were found at the first level of 63 shaft. They are each one inch wide and contain good values. It is probable they are extensions or branches of the previously known veins. Development of these veins at the second level will be delayed until connection between 63 shaft and 96 tunnel has been completed, in about five weeks. This future development will probably produce satisfactory results.

"The low grade mill treated 6,814 tons. The high grade plant treated 173 tons. The refinery shipped 106,624 fine ounces of bullion.

"Following is an estimate of production for the month of March:—

Low Grade Mill	213,789
Washing Plant	170,934
Total	\$384,723

Silver Ore and Bullion Shipments

Ore shipments from Cobalt during the week ended April 9th totalled well over half a million pounds. Five companies contribute to the output, sending out a total of eight cars containing approximately 575,736 pounds.

Following is a summary:—

Shippers	Cars	Pds.
Temiskaming	2	156,663
Coniagas	2	148,000
Northern Customs	2	130,400
La Rose	1	65,673
Dominion Reduction	1	65,000
Totals	8	575,736

During the corresponding period, no bullion shipments were reported.

GOLD MINES

A slight, though gradual improvement in the economic conditions is steadily adding to the scope of mining operations in the gold-bearing districts of Northern Ontario. Questions pertaining to labor, that is to say: the temper of the workers and the question of wages, is one that may or may not enter into the calculations which are to correctly deal with this year's work. However, harmony is as much in evidence now as formerly, and the Porcupine district has not had a labor disturbance since 1912.

The Hollinger Consolidated continues to treat approximately 2,200 tons of ore daily, while the number of men engaged number 1,100. From this it will be noted that about two tons of ore is being treated for each man on the new pay-roll. This will compare with about 1½ tons per man at one time during the war.

At the Porcupine Crown, the mill is operating at nearly full capacity and mill heads are reported to be running high, the average grade of the broken ore being around \$11 to the ton.

The McIntyre-Porcupine has cut the downward continuation of its main, or No. 5 ore body, at a depth of approximately one quarter of a mile. The vein shows a width of about fourteen feet, and is comparatively high grade at the point where cut. This is confirmation of diamond-drill results formerly secured while drilling from the 1,000-ft. level. It is now proposed to carry out an aggressive development program at the present depth, as well as to direct attention toward still deeper workings.

Nothing of more than ordinary interest is reported this week on the Dome, with the exception that good progress is being made at the 1,100-ft. level in the work of exploring the Dome Extension property.

Reports that an exploration program has been outlined for the Gold Reef have served to attract interest toward that property. It is reported that a large block of stock has been underwritten at a price that promises to finance a fairly comprehensive scheme of exploration.

In the Kirkland Lake field, the report on the Kirkland Lake Gold Mines is one of the features of the week. The report shows that sufficient ore is blocked out between the 300-ft. level and the 700-ft. level to keep the mill operating at full capacity of 150 tons a day for more than two years. While the report thus refers to "ore," yet it is disappointing to note that no reference whatever is made as to either the grade of the ore tested during the past year, or to the gold content of that said to be blocked out.

Premature reports have been sent abroad that the Tough-Oakes Gold Mines had resumed early this month. The truth is that this is under consideration, and may possibly take place some time next month. Even such an early start has not been definitely decided upon.

On the Canadian-Kirkland it has been decided to discontinue the present plan of exploration underground, and, instead to carry on a diamond drilling campaign.

ADVISORY CONFERENCE COMMITTEE ON ENGINEERING LEGISLATION IN ONTARIO.

Views of all Engineers are sought.

In common with their fellows of other provinces, the engineers of Ontario are keenly interested in obtaining suitable legislation to establish their status and to regulate their practice. To accomplish any real results, it was realized that all branches of engineering should be consulted, and that all kinds of divergent opinions must be brought together on common ground.

The Advisory Conference Committee has been formed with this end in view. The Committee consists of two representatives of each of the following organizations:—

- Canadian Mining Institute;
- Engineering Institute of Canada—Ontario Division;
- American Society of Mechanical Engineers—Ontario Section;
- American Institute of Electrical Engineers—Toronto Section;
- Canadian Institute of Chemistry;
- Association of Ontario Land Surveyors.
- Ontario Association of Architects.

The above organizations have been chosen as most representative of their respective branches of engineering in Ontario.

Two lengthy sessions have already been held, and much progress has been made towards the establishment of broad general principles upon which legislation should be based. Now that the work is well organized, it is the intention of the Committee to pursue the matter vigorously until a conclusion has been reached. The task is not an easy one, and if some considerable span of time should be found necessary to its fulfillment, it will be because the Committee wish to be thorough, and to bring in a report, which can be freely endorsed by both parties. The matter is being considered by the committee with a view to meeting the requirements of the different branches of the profession as well as eliminating grounds for objection on the part of any branch, while retaining one general organization of the whole profession. It is perhaps not going too far to say that the result of the conferences already give reason to expect a satisfactory conclusion.

The views of all engineers of Ontario are sought, and any of them may feel free to communicate with the Committee to this end. Mr. Clifford E. Smith is chairman; Mr. Willis Chipman, Vice-Chairman, and Mr. F. R. Ewart, Secretary. Communications may be addressed to the latter at 207 Excelsior Life Building, Toronto.

TORONTO NOTES.

(By Our Toronto Correspondent.)

A meeting of the shareholders of the University Mine was held in Toronto on April 5th, when it developed that legal proceedings on behalf of certain minority shareholders of the company had delayed the sale of the assets of the mine to the La Rose Mine. The officers are now faced with an interim injunction to restrain the sale and an adjournment for three weeks was taken.

The La Rose Mine already owns about 98 per cent of the stock of the University, but news of the proposed transfer brought the 2 per cent minority, or some of them, into action, with the result that an interim injunction was granted by Judge Wallace in Woodstock, Ont. It is understood that the minority

shareholders of University Mines number about forty, and their share of the liability of \$61,000 of University to La Rose, which it was proposed to wipe out in payment for the entire property, is about \$1,200. The claim is made that to wipe out their rights, for this small debt, would be unfair and illegal, and that the proposed price is altogether inadequate.

It seems quite likely that extension of the T. & N. O. Railway from Cochrane to Moose Factory on James Bay will be proceeded with in the not far distant future. The Ontario Legislature has gone on record as favoring the extension of the line and Premier Drury has declared his entire approval of the project. The Premier said that the Government was placing \$25,000 in the estimates for surveys and exploration of the route to the Bay. He depreciates, however, embarking on any large capital expenditure at the present time.

The attempt of J. A. Jacobs of Montreal to secure by agreement certain rights with regard to the external affairs of Black Lake Asbestos and Chrome Company, has received a set-back by the decision of Mr. Justice Kelly in Toronto, granting an injunction to McDougall and Cowans on behalf of themselves and their shareholders against the directors of Black Lake restraining them from carrying out an agreement made with Mr. Jacobs. The action arose out of an agreement whereby Mr. Jacobs was to be given certain rights with regard to the internal affairs of the company, including the right to choose his own board of directors. Conditional thereto he undertook to purchase a proportion of the company's stock. It is anticipated that the court decision will defeat Mr. Jacob's attempt to gain control of the company.

At a meeting of the shareholders of the Black Lake Asbestos & Chrome Company held in Toronto on Wednesday of this week the proposal to move the head office of the company to Montreal was dropped. A committee was appointed to represent the shareholders and bondholders and co-operate with the directors in connections with any future negotiations for possible sale of control of the company.

Hugh Sutherland, of the firm of F. C. Sutherland and Company, and party of English capitalists who recently spent a week in Porcupine, Kirkland Lake and Cobalt, returned to the city last week and expressed themselves as being impressed with the mineral possibilities of Northern Ontario.

They were particularly surprised by the magnitude of operations at Porcupine. The party included two well-known mining engineers. As a result of their visit it would not be surprising to learn of a considerable volume of new capital coming into the camp in the immediate future. The party, accompanied by Mr. Sutherland, is returning to London via C.P.R. liner S.S. Corsican, sailing from St. John, N.B. Mr. Sutherland expects to be in England about two months.

Mr. J. A. M. Alley, a director and secretary-treasurer of Wasapika Consolidated Mines Ltd., died in Toronto on April 2. Mr. Alley was 65 years of age and was born in Quebec.

He early became identified with the Traders Bank, of which he was Secretary when the amalgamation with the Royal Bank took place. He was then appointed Manager of the Toronto office of the Royal Bank, a position which he held until he retired from the bank's service.

NEED OF "SEASONAL" COAL RATES.

A word much used, and like other commonly employed terms sometimes abused, is the adjective "seasonal" as applied to industry. Occasionally there appears to be an undue and unreasoning subservience to the restrictive influences of the seasons.

The bans imposed by nature upon agriculture are the least escapable. Even some of these have been made more elastic by more scientific farming. It is in mining and manufacture that a good deal of needless and wasteful tyranny, consecrated by custom, persists. Some of these customs are almost as arbitrary as the fashions.

A notable instance is the marketing of coal. The individual, seeking a convenience and cheapness that are often illusory, helps impose a collective handicap of cost or danger, and helps disorganize the great industry of coal mining—with such incidental effects as complaints and strikes of the miners. The need is to encourage an ordering of coal pretty much the year round, instead of a convergence of demand on a small part of the year.

The remedial suggestion expressed recently in the Boston News Bureau by Vice-President Cousens of the Metropolitan Coal Co., in favor of "seasonal" rates on bituminous coal to encourage the movement at the proper time of year, meets with favorable consideration from railroad men and coal people in New England.

As a matter of fact it is understood that during federal operation a suggestion to this effect was made but for some reason without result. The subject, however, is one that is likely to receive increasing attention. It is not revolutionary and seems to be one means of relieving New England of the recurring winter periods of distress from acute coal shortage.

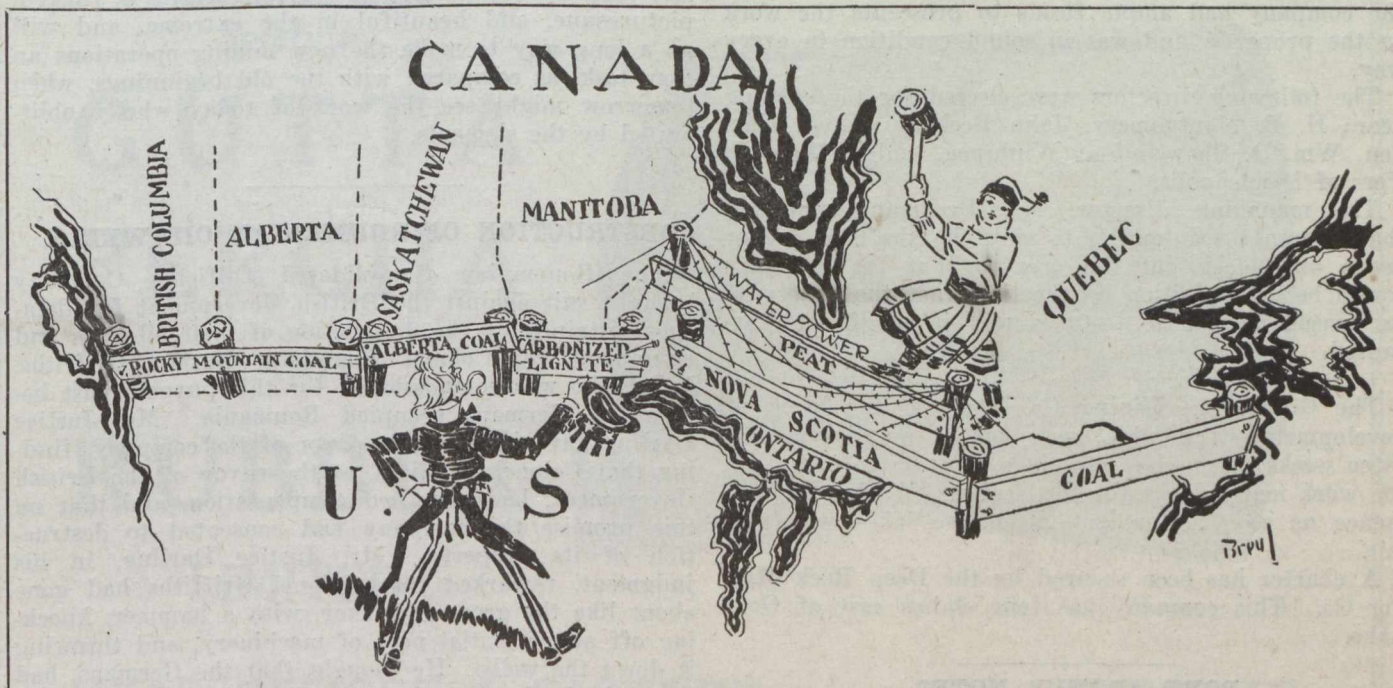
President E. J. Pearson, of the New Haven Railroad, says it is possible that the New England railroads may undertake to develop interest on the part of the consumers of coal in New England in the direction of laying in such quantities during the open season that along about the first of next December there will be an average of perhaps three months' supply at the various points of use or local distribution throughout New England.

Eugene McAuliffe, who has been largely identified with the use and production of fuel, and who did much valuable work during federal operation in the direction of fuel economy, declares that the fundamental and crying need of the bituminous business in stabilization, "The production curve, work day curve and workers' wage curve, as well as the profit and loss curve, all show too many peaks and valleys."

The effect of the fluctuating load that is now being placed on the over-taxed transportation facilities of the country represents a great source of economic waste. For instance during summer months the railroads, which own 974,547 coal-carrying cars, are ordinarily taxed for storage room in which to place their idle cars. Certain roads whose freight traffic is 50 per cent or 60 per cent coal are compelled to send their cars elsewhere in order to find room for them.

To bring about equalization it will probably be necessary for all consumers, including railroads, industries and domestic dealers and distributors, to purchase during the months of March to August, inclusive, about 50,000,000 tons of bituminous coal that is now ordinarily purchased during the remaining six months of the year.

The publication of "seasonal" coal freight rates with a reduction from the established basis from March to August, inclusive, would, assist very materially in remedying conditions.—Boston News Bureau.



"SURELY BY THIS THE CANADIANS SHOW THEMSELVES TO BE OUR BLOOD KIN."

"For they Exhibit the Same Readiness to Sell and the Chariness to Buy that is ours in Generous Measure."

—From "Coal Age" of March 25th, 1920.

MANITOBA LETTER.

By CHAS. A. MILICAN, Winnipeg, Man.

V. H. Campbell, of the Public Works Department, Provincial Government has left for the Rice Lake District to complete the survey and carry on construction of the new Summer Road from Hole River to Caribou Lake. All the camp equipment, hay and oats for feed, road scrapers, explosives and drilling tools have been delivered on the ground at Gold Creek, some three miles along the new road location, which starts from the Lower Bellevue Landing on Hole River. This work will be pushed ahead as rapidly as possible, so that the road may be in commission by July or August.

It is authoritatively stated that prominent and substantial Americans, including well known Minnesota bankers have secured a group of claims on Hole River. This group consists of six claims directly east of the Gold King's holdings. The claims are the "Omi Fraction," "Knox," "Dunn," "Marconi," "Jack Pine Fraction," and "Wilson." This property has been only partially prospected, but is said to have some very attractive leads. A wide vein runs diagonally across one of the claims, and it is the intention of the new owners to put a diamond drill on this lead and prove it up.

The Pan Extension Gold Mines Co., Ltd., held its annual meeting April 5th.

The directors reported that the affairs of the company were in a very satisfactory condition, and that preparations had been made for systematic and energetic work on the property. To this end one of the most complete plants in the province has been installed, and a large supply of wood for fuel purposes brought to the mine, sufficient to secure the operations on the property through the entire season.

The financial statement was read and showed that the company had ample funds to prosecute the work on the property, and was in sound condition in every way.

The following directors were elected for the ensuing year: H. B. Montgomery, John Beckman, E. J. Harden, Wm. D. Shaw, all of Winnipeg, and William F. Yers of Minneapolis.

The managing director, Mr. Beckman, explained that it was the intention to sink the shaft to deeper levels and block out the ores so that the company would be in a position by the time that the next winter season arrived to instal a mill if conditions warranted.

The Gold King Mining Co. has sold the block of development stock which was placed on the market three weeks ago and is now in a position to carry out the work mapped out for this season. Work will commence as soon as navigation on the lakes will permit.

A charter has been secured by the Deep Rock Mining Co. This company has four claims east of Gold Lake.

PORT ARTHUR NOTES.

By J. J. O'CONNOR.

Messrs. Wilson Bradley, and R. C. Jamison, of the Silver Islet Syndicate, are in Port Arthur, engaged in assembling the necessary plant and machinery for the opening of Silver Islet Mine. Much of this has al-

ready arrived, part of the plant is being secured locally, and all will be in readiness to begin this important undertaking on the opening of navigation, in about ten days.

For the present, they purpose unwatering the mine, down to the 100 foot level, and will then have a look over the roof and workings, to that depth.

A large percentage of values taken out under former operations, were found in that zone.

Further plans will be determined on the results of this preliminary work.

The water will be blown out of the mine by an air lift, with a capacity of one thousand gallons per minute. No difficulty is anticipated in keeping the zone of operations free of water, and it is expected that the work will be carried out under the very best of mining conditions.

No plans for the mainland operations have been definitely decided upon, but are being given consideration.

The revival of this famous old silver mine, will be watched with interest, by the whole mining fraternity, and their best wishes go out to these enterprising men, in their spectacular undertaking.

Conditions today, are in striking contrast to those that obtained in 1869, when the first mining work was done on this little speck of bare rock, less than one hundred, by one hundred feet, in size, and but nine feet above the surface of Lake Superior. At that time the mainland was an unbroken wilderness, now it is the most popular summer resort on the north shore of Lake Superior, peopled in season, by many happy souls, housed in the most inviting cottages, with ample wharf, and landing accommodations. There is no finer bit of scenery on the north shore of Lake Superior, than in the vicinity of Silver Islet, it is rugged, picturesque, and beautiful in the extreme, and will go a long way to make the new mining operations an easy task, as compared with the old beginnings, when tomorrow might see the work of today wholly obliterated by the elements.

DESTRUCTION OF ROUMANIAN OIL WELLS.

The Roumanian Consolidated Oilfields Company brought suit against the British Government for damages sustained by the destruction of their oil-wells and equipment by Colonel Sir John Norton Griffiths, M.P., who was commissioned for this purpose just before the Germans occupied Roumania. Mr. Justice Darling gave judgment in favor of the company, finding that Colonel Griffiths, as the envoy of the British Government, had promised compensation, and that on this promise the company had consented to destruction of its property. Mr. Justice Darling, in his judgment, remarked that Colonel Griffiths had gone about like the great god Thor, with a hammer, knocking off any essential part of machinery, and throwing it down the wells. He thought that the Germans, had they obtained possession of the oilfields undamaged would have worked them to their own advantage, nor could he imagine that these "foresighted summoners of war and waste" would have gone away and left enemy property in any better position than they left the library at Louvain.

(Look for this Trade Mark)



The Belt that Set the Pace

For Cone Drives and other
Difficult Transmission Service

*Manufactured
Solely by*

**GUTTA
PERCHA
AND
RUBBER
LIMITED**



175 FEET, 50 INCH 12 PLY
P.M.S. BELTING
WEIGHT 2900 POUNDS

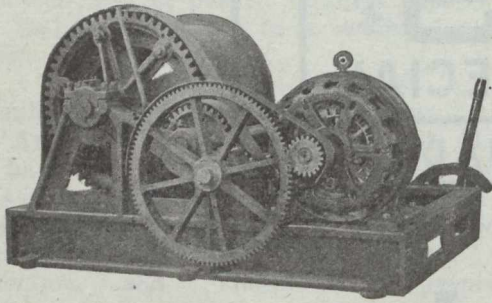
HEAD OFFICES & FACTORY . . . TORONTO

Branches in all leading Cities of the Dominion

A MARSH HOIST

IS MADE THE RIGHT SIZE FOR YOUR MINE

and in either Steam Power or Electric Power



This shows one of our Electric Mine Hoists. We make many other types. Send for our catalogue of Mine Hoists, Cars, Cages, Buckets, etc., and see what we offer you. It will repay you.

From the little 10 Horse Power size for prospectors or small mines to the massive 50 Horse Power size, one of our 7 sizes should be just right for your mine.

We are specialists in the building of Hoisting Machinery of all sorts. For nearly a quarter of a century we have been designing and building Hoists, and have developed a Hoist that we are really proud of—proud because of the record of good work they have done, and are doing in mines, quarries, and other classes of work from one end of Canada to the other.

MARSH ENGINEERING WORKS, Limited

ESTABLISHED 1846

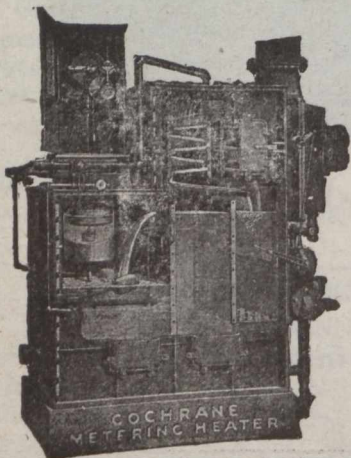
BELLEVILLE, ONTARIO, CANADA

Sales Agents:—MUSSENS, LIMITED, Montreal, Toronto, Winnipeg and Vancouver

Why Waste Coal When It Costs So Much?

THE COCHRANE METERING HEATER TELLS HOW
MUCH YOU ARE GETTING FOR YOUR MONEY.

How many pounds of coal do you use to produce a thousand pounds of steam? 200, 150, 100 or less. A Cochrane Metering Heater will tell how many pounds of water are evaporated per pound of coal, and it will instantly show any improvement in evaporation due to better fuel, better methods of firing, better condition of heating surfaces (removal of soot and scale), better condition of boiler setting (stopping up air leaks), etc.



Send for Catalogue No. 820

OFFICES---Toronto, Montreal, Quebec, Halifax, Sydney, Ottawa, Cobalt, S. Porcupine, Hamilton, London, Winnipeg, Calgary, Edmonton, Nelson, Vancouver.

CANADIAN ALLIS - CHALMERS

LIMITED

Chain Drives for Mines Mean Fewer Shut-downs

MINE drives must operate under varying conditions—dampness, dirt, heat, coldness. Each of these conditions has a direct effect on leather belts.

Sometimes they stretch. Sometimes they shrink. Sometimes they slip. Sometimes they break. Never do they render anywhere near 100% efficiency.

Link-Belt Silent Chain Drives are unaffected by heat, coldness or dampness. They deliver 98.2% of the power to the driven machine all the time. They never slip—never waste power—and breakage is almost unheard of.

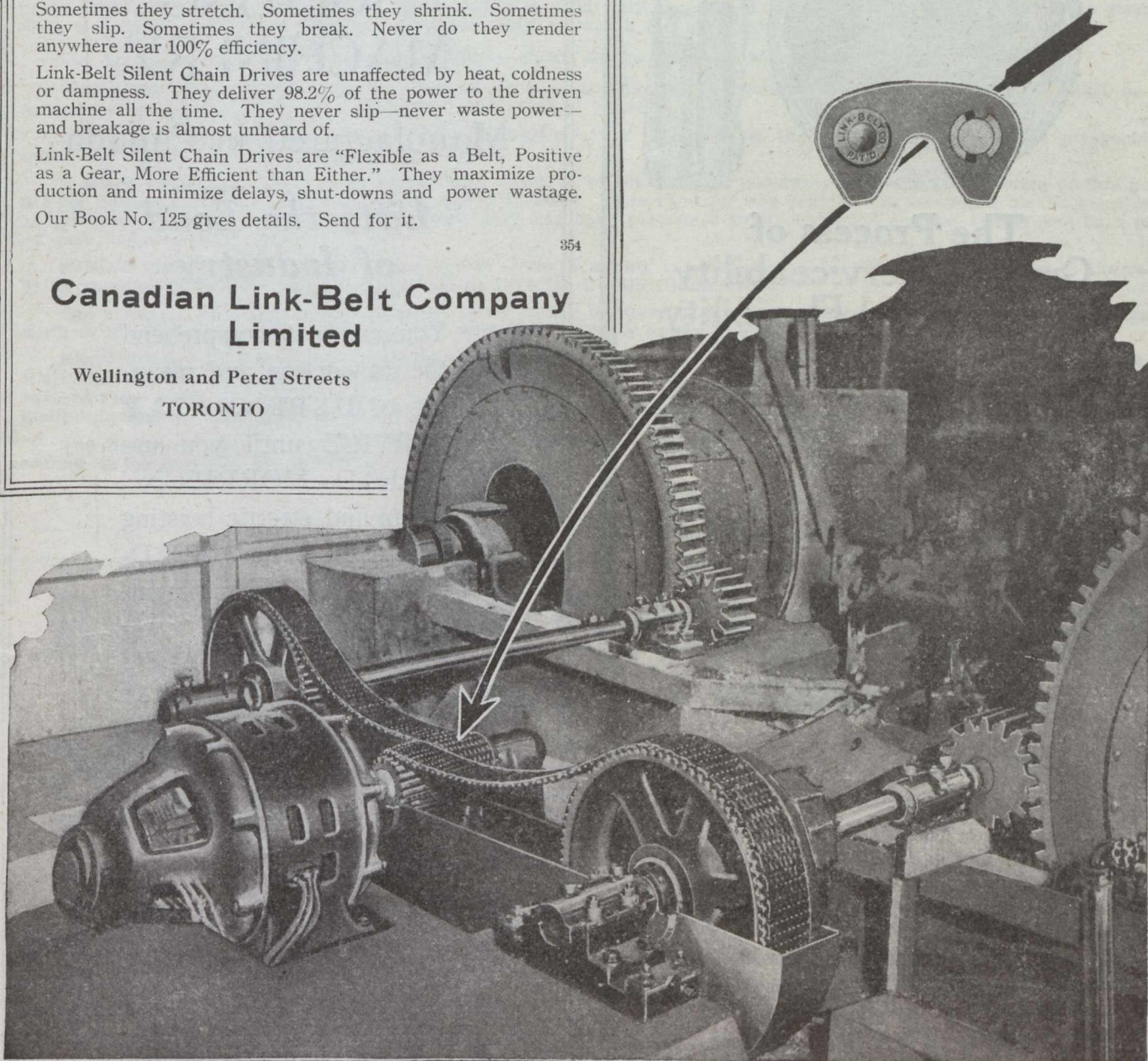
Link-Belt Silent Chain Drives are "Flexible as a Belt, Positive as a Gear, More Efficient than Either." They maximize production and minimize delays, shut-downs and power wastage.

Our Book No. 125 gives details. Send for it.

354

Canadian Link-Belt Company Limited

Wellington and Peter Streets
TORONTO



LINK-BELT SILENT CHAIN DRIVES

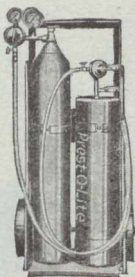
We Also Make

- Elevators and Conveyors
- Link-Belt and Sprockets
- Truck and Tractor Chains
- Electric Hoists
- Portable Loaders
- Coal and Ashes Systems
- Coal Pockets
- Complete Sand and Gravel Plants

Write for Catalogs
Place X in Square

Oxy-Acetylene Welding and Cutting

Prest-O-Lite



The Process of Greatest Serviceability Economy and Flexibility

Whether your problem involves the joining or sundering of metals or the maintenance of machinery, you will eventually come to Prest-O-Lite oxy-acetylene welding because of its greater range of serviceability, its economy and flexibility.

Prest-O-Lite, the purest acetylene, supplied in convenient, portable cylinders, is the gas without limitations, dissolved chemically so that a large quantity is available in small bulk.

Prest-O-Lite

DISSOLVED ACETYLENE

'The Universal Gas with the Universal Service'

Prest-O-Lite Service insures prompt replacements and a steady supply. Once your initial shipment of cylinders is at hand, you are ready for any kind of flame-heating operation—from the lightest soldering or brazing to the heaviest welding and cutting.

We'd like to tell you more about **Prest-O-Lite Service** and the plan under which our users enjoy it. Write,

PREST-O-LITE COMPANY
of Canada, Limited

Department C-108
Prest-O-Lite Building
TORONTO, ONT.

Branches: Montreal, Toronto,
Winnipeg

Plants at:—
Toronto, Ont. Shawinigan Falls, P.Q.
Merritton, Ont. St. Boniface, Man.



World's Largest Makers of Dissolved Acetylene

MEAD-MORRISON

CANADIAN
MM
©

CANADIAN
MM
©

HOISTING MACHINERY

Manufactured in Canada

*Lifts the Load
of Industry*

You can not comprehend the satisfaction and meaning of **DEPENDABLE SERVICE** until you use "MEAD - MORRISON" steam and electric hoisting engines or other "MEAD-MORRISON" equipment.

Builders of hoisting machinery for over 50 years.



CLAM SHELL
and
ORANGE PEEL GRAB BUCKETS



Contractors for complete
Material handling plants.



Put Your Problem Up To Us

CANADIAN MEAD-MORRISON CO

LIMITED
285 BEAVER HALL HILL
MONTREAL

WORKS

WELLAND ONT.



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 the 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 J. E. PERRAULT,
MINISTER OF COLONIZATION, MINES AND FISHERIES, QUEBEC.

BRITISH COLUMBIA

The Mineral Province of Western Canada

Has produced Minerals valued as follows: Placer Gold, \$75,436,103; Lode Gold, \$97,121,786; Silver, \$46,839,631; Lead, \$42,294,251; Copper, \$145,741,069; Other Metals (Zinc, Iron, etc.), \$13,278,058; Coal and Coke, \$187,147,652; Building Stone, Brick, Cement, etc., \$28,843,272; Miscellaneous Minerals, \$651,759; making its mineral production to the end of 1918 show an

Aggregate Value of \$637,353,581

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; for the year 1917, \$37,010,392; for the year 1918, \$41,782,474.

Production During last ten years, \$313,976,022

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



Tough as a Tire Tread— This Hose Cover

IN mines, quarries, tunnel work, ship-yards and structural steel work, the tough cover on Goodyear Air Drill Hose and Goodyear Pneumatic Tool Hose has resulted in more work and a lowering of hose cost.

The life of hose in this work depends about 75% on the cover. Dragged over rock and ore and steel girders, tramped on and run over, it takes a tough and well-designed hose to give any length of service.

We have records of Goodyear Air Drill Hose in constant service for 18 months to 2 years.

The cover of white rubber is as tough as a tire tread. It is extra thick. It wears long, even under rough handling.

To balance such a good cover is a specially developed, oil-resisting inner tube; and fabric of extra strength.

So good are Goodyear Pneumatic Tool Hose and Goodyear Air Drill Hose that five-ply is found as satisfactory as six or seven-ply of old-style hose.

The thoroughness with which Goodyear Air Drill and Pneumatic Tool Hose has been designed and built, is paralleled in every kind of Goodyear Industrial Hose. The problems of each industry have been studied carefully. The solution to those problems has been worked out in the Goodyear laboratories. The Goodyear Industrial Hose man has a mighty interesting story to tell to industrial executives. No obligation on your part if you have him call. Just phone, wire or write the nearest branch.

The Goodyear Tire & Rubber Co. of Canada, Limited

Branches—Halifax, St. John, Quebec, Montreal, Ottawa, Toronto, Hamilton, London, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Vancouver. Service Station Stocks in other Cities

GOOD YEAR
MADE IN CANADA
INDUSTRIAL HOSE

MANGANESE STEEL CASTINGS

FOR

All Kinds of MINING MACHINERY,
CRUSHER JAWS, HAMMERS AND
HAMMER TIPS, LINERS FOR
CYCLONE BEATERS
BUCKET TIPS, STAMPS AND DIES,
DREDGER POINTS

Mild Steel Castings for all purposes

Electric Process—therefore the BEST

Our Special Quality "HYMANG"
BALLS FOR BALL MILLS RE-
DUCE COST OF ORE PER TON
CRUSHED

CANADIAN BRAKESHOE CO., LIMITED
SHEPROOKE, QUEBEC

CARBIDE LAMPS

FLOAT FEED
Patented

The Simplest of All Lamps

It is less complicated than other lamps. You simply charge it with carbide and water, open the valve full wide, light and it burns and it keeps on burning until the charge is completely used up. No raking. No shaking. No adjusting.



Care of this lamp is equally simple. May we send you evidence of this in form of a sample lamp? No obligation incurred on your part.

DEWAR MFG. COMPANY

INC.

44 Pearl Street, TORONTO, ONT.

Deloro Smelting & Refining Co. LIMITED

SMELTERS AND REFINERS OF

Silver Bullion

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



Standard Underground Cable Co. of Canada, Limited

General Offices and Works, Hamilton, Ont.

Manufacturers of

Copper, Brass, Bronze Wire
Colonial Copper Clad Steel Wire
Insulated Wire of all kinds
Lead Covered and Armored Cables

Write our nearest office for prices

Montreal, Hamilton, Toronto, Seattle

The Consolidated Mining and Smelting Company

OF CANADA, LIMITED

Smelting and Refining: TRAIL, BRITISH COLUMBIA

Buyers of

GOLD, SILVER, COPPER, LEAD and ZINC ORES

Producers and Sellers of

Copper - Lead - Zinc

Tadanac Brand

General Sales Offices: - - Drummond Building, Montreal

The University of Toronto

and University College

with which are federated

VICTORIA

TRINITY

ST. MICHAELS

KNOX and WYCLIFFE COLLEGES

FACULTIES OF

Arts, Applied Science, Music, Medicine
Education, Household Science, Forestry

For further information apply to the Registrar of the University or to the Secretaries of the respective faculties.

Low Freezing Dynamites

Minimize danger and save time in cold-weather blasting. Their low freezing point eliminates thawing expense until temp. reaches 32 F., and adds to safety.

C. X. L. 30 to 60 per cent. strengths give special satisfaction in winter operations.

Distributing Magazines at all of the following district office points, and throughout all provinces of Canada.



Canadian Explosives, Limited

Head Office MONTREAL, P.Q.
Main Western Office VANCOUVER, 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.

- Acetylene Gas:**
Canada Carbide Company, Ltd.
Canadian Fairbanks-Morse.
Prest-O-Lite Co. of Canada, Ltd.
- A.C. Units:**
MacGovern & Co.
- Agitators:**
The Dorr Co.
- Air Hoists:**
Canadian Ingersoll-Rand Co., Ltd.
Mussens, Limited.
- Alloy and Carbon Tool Steel:**
H. A. Drury Co., Ltd.
International High Speed Steel Co., Rockaway, N.J.
- Alternators:**
MacGovern & Co.
Spielman Agencies, Regd.
- Aluminium:**
- Amalgamators:**
Northern Canada Supply Co.
Mine and Smelter Supply Co.
Wabi Iron Works.
- Antimony:**
Canada Metal Co.
- Antimonial Lead:**
Pennsylvania Smelting Co.
- Arrester, Locomotive Spark:**
Hendrick Manufacturing Co.
- Arsenic White Lead:**
Coniagas Reduction Co.
- Assayers' and Chemists' Supplies:**
Dominion Engineering & Inspection Co
Lymans, Limited
Mine & Smelter Supply Co.
Pennsylvania Smelting Co.
Stanley, W. F. & Co., Ltd.
- Ash Conveyors:**
Canadian Link-Belt Company
- Ashes Handling Machinery:**
Canadian Mead-Morrison Co., Limited
- Assayers and Chemists:**
Milton L. Hersey Co., Ltd.
Campbell & Deyell
Ledoux & Co.
Thos. Heys & Son
C. L. Constant Co.
- Asbestos:**
Everitt & Co.
- Balls:**
Canadian Foundries and Forgings, Ltd.
Canadian Steel Foundries, Ltd.
Hull Iron & Steel Foundries, Ltd.
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
The Wabi Iron Works.
The Hardinge Conical Mill Co.
- Ball Mills:**
Hardinge Conical Mill Co.
Hull Iron & Steel Foundries, Ltd.
Mine and Smelter Supply Co.
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
The Wabi Iron Works.
- Balances—Housser:**
Canadian Fairbanks-Morse Co., Ltd.
Mine and Smelter Supply Co.
- Babbit Metals:**
Canada Metal Co.
Canadian Fairbanks-Morse Co., Ltd.
Hoyt Metal Co.
- Ball Mill Feeders:**
Fraser & Chalmers of Canada, Ltd.
Hardinge Conical Mill Co.
Hull Iron & Steel Foundries, Ltd.
- Ball Mill Linings:**
Hardinge Conical Mill Co.
Hull Iron & Steel Foundries, Ltd.
- Belting—Leather, Rubber and Cotton:**
Canadian Fairbanks-Morse Co., Ltd.
Link Belt Co.
The Mine & Smelter Supply Co.
Northern Canada Supply Co.
Jones & Glaseco.
- Belting:**
R. T. Gilman & Co.
- Belting (Transmission):**
Goodyear Tire & Rubber Co.
- Belting (Elevator):**
Goodyear Tire & Rubber Co.
- Belting (Conveyor):**
Goodyear Tire & Rubber Co.
- Blasting Batteries and Supplies:**
Canadian Ingersoll-Rand Co., Ltd.
Mussens, Ltd.
Northern Canada Supply Co.
Canadian Explosives, Ltd.
Giant Powder Co. of Canada, Ltd.
- Bluestone:**
The Consolidated Mining & Smelting Co.
- Blowers:**
Canadian Fairbanks-Morse Co., Ltd.
MacGovern & Co., Inc.
Northern Canada Supply Co.
Fraser & Chalmers of Canada, Ltd.
- Boilers:**
Northern Canada Supply Co.
Canadian Ingersoll-Rand Co., Ltd.
Marsh Engineering Works
MacGovern & Co., Inc.
R. T. Gilman & Co.
Fraser & Chalmers of Canada, Ltd.
The John Inglis Company
Wabi Iron Works.
- Blue Vitriol (Coniagas Red):**
Canadian Fairbanks-Morse Co., Ltd.
- Bortz and Carbons:**
Diamond Drill Carbon Co.
- Boxes, Cable Junction:**
Standard Underground Cable Co. of Canada, Ltd.
Northern Electric Co., Ltd.
- Brazilian Rough Diamonds:**
Diamond Drill Carbon Co.
- Brazilian Mica:**
Diamond Drill Carbon Co.
- Buggies, Mine Car (Steel)**
Hendrick Manufacturing Co.
- Brazilian Ballas:**
Diamond Drill Carbon Co.
- Brazilian Rock Crystal:**
Diamond Drill Carbon Co.
- Brazilian Tourmalines:**
Diamond Drill Carbon Co.
- Brazilian Aquamarines:**
Diamond Drill Carbon Co.
- Bridges—Man Trolley and Rope Operated—Material Handling:**
Canadian Mead-Morrison Co., Limited
- Bronze, Manganese, Perforated and Plain:**
Hendrick Manufacturing Co.
- Buckets:**
Canadian Ingersoll-Rand Co., Ltd.
Canadian Mead-Morrison Co., Limited
The Electric Steel & Metals Co.
R. T. Gilman & Co.
Hendrick Manufacturing Co.
Link-Belt Co.
Marsh Engineering Works
Mussens, Ltd.
MacKinnon Steel Co., Ltd.
Northern Canada Supply Co.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works
- Buckets, Elevator:**
Hendrick Mfg. Co.
- Cable—Aerial and Underground:**
Northern Canada Supply Co.
Standard Underground Cable Co. of Canada, Ltd.
- Cableways:**
Canadian Mead-Morrison Co., Limited
Fraser & Chalmers of Canada, Ltd.
Mussens, Ltd.
The Wabi Iron Works
R. T. Gilman & Co.
- Cages:**
Canadian Ingersoll-Rand Co., Ltd., Montreal, Que.
Northern Canada Supply Co.
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
The Mine & Smelter Supply Co.
Mussens, Ltd.
The Wabi Iron Works

THE CONIAGAS REDUCTION

COMPANY, LIMITED

St. Catharines - - - Ontario

Smelters and Refiners of Cobalt Ores

Manufacturers of

Copper Sulphate

Bar Silver—Electrically Refined

Arsenic—White and Metallic

Cobalt Oxide and Metal

Nickel, Oxide and Metal

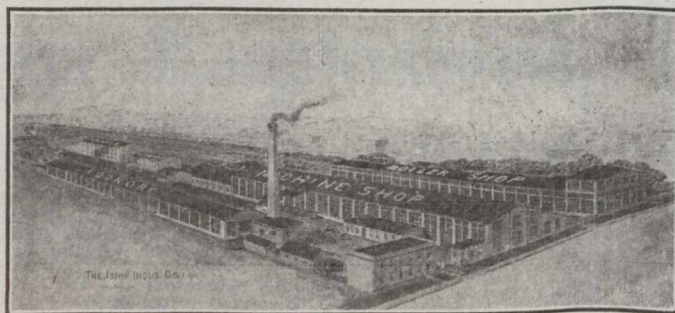
Telegraphic Address:
"Coniagas."

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

Bell Telephone, 603 St. Catharines

ENGINES, BOILERS and TANKS

WRITE US
FOR PRICES
AND
SPECIFICATIONS



HEAVY
PLATE WORK
and
SPECIAL
MACHINERY

PLANT OF THE JOHN INGLIS CO. LIMITED

THE JOHN INGLIS COMPANY, LIMITED

14 Strachan Avenue, TORONTO, Canada

Representatives in Eastern Canada:
Ottawa Representative:

JAS. W. PYKE & CO., LTD., 232 St. James Street, MONTREAL
J. W. ANDERSON, 7 Bank Stree Chambers

Canadian Miners' Buying Directory.—(Continued)

- Cables—Wire:**
Standard Underground Cable Co. of Canada, Ltd.
Canada Wire & Cable Co.
Fraser & Chalmers of Canada, Ltd.
Northern Electric Co., Ltd.
Osborn, Sam'l (Canada) Limited.
R. T. Gilman & Co.
- Cable Railway Systems:**
Canadian Mead-Morrison Co., Limited.
- Cam Shafts:**
Canada Foundries & Forgings, Ltd.
Hull Iron & Steel Foundries, Ltd.
- Car Dumps:**
Sullivan Machinery Co.
R. T. Gilman & Co.
Canadian Fairbanks-Morse Co., Ltd.
Canadian Mead-Morrison Co., Limited.
- Carbide of Calcium:**
Canada Carbide Company, Ltd.
- Cars:**
Canadian Foundries and Forgings, Ltd.
Canadian Ingersoll-Rand Co., Ltd.
Canadian Fairbanks-Morse Co., Ltd.
Canadian Mead-Morrison Co., Limited.
John J. Gartshore
MacKinnon Steel Co., Ltd.
The Electric Steel & Metals Co.
Northern Canada Supply Co.
Osborn, Sam'l (Canada) Limited.
Marsh Engineering Works
Mine and Smelter Supply Co.
Fraser & Chalmers of Canada, Ltd.
Mussens, Limited
R. T. Gilman & Co.
The Wabi Iron Works
- Car Wheels and Axles:**
Canadian Car Foundry Co., Ltd.
Burnett & Crampton
Hull Iron & Steel Foundries, Ltd.
John J. Gartshore
Marsh Engineering Works, Ltd.
Osborn, Sam'l (Canada) Limited.
The Electric Steel & Metals Co.
The Wabi Iron Works
- Carriers (Gravity):**
Jones & Glasco
- Castings—Brass**
The Canada Metal Co., Ltd.
- Castings (Iron and Steel)**
Burnett & Crampton
Canadian Steel Foundries, Ltd.
Hull Iron & Steel Foundries, Ltd.
Osborn, Sam'l (Canada) Limited.
The Electric Steel & Metals Co.
The Wabi Iron Works
- Cement and Concrete Waterproofing:**
Spielman Agencies, Regd.
- Cement Machinery:**
Northern Canada Supply Co.
Hadfields, Limited
Hull Iron & Steel Foundries, Ltd.
Osborn, Sam'l (Canada) Limited.
Fraser & Chalmers of Canada, Ltd.
Canadian Fairbanks-Morse Co., Ltd.
The Electric Steel & Metals Co.
R. T. Gilman & Co.
Burnett & Crampton
- Chains:**
Jones & Glasco
Northern Canada Supply Co.
Canadian Fairbanks-Morse Co., Ltd.
Link-Belt Co.
Greening, B., Wire Co., Ltd.
- Chain Drives:**
Jones & Glasco
- Chemical Apparatus:**
Mine and Smelter Supply Co.
- Chemists:**
Canadian Laboratories
Campbell & Deyell
Thos. Heyes & Sons
Milton Hersey Co.
Ledoux & Co.
Constant, C. L. Company
- Chrome Ore:**
The Electric Steel & Metals Co.
Everett & Co.
- Classifiers:**
Mine and Smelter Supply Co.
Mussens, Limited
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works
R. T. Gilman & Co.
The Dorr Company
- Coal:**
Dominion Coal Co.
Nova Scotia Steel & Coal Co.
- Coal Cutters:**
Osborn, Sam'l (Canada) Limited.
Sullivan Machinery Co.
Canadian Ingersoll-Rand Co., Ltd.
- Coal Crushers:**
Canadian Mead-Morrison Co., Limited
- Coal Mining Explosives:**
Canadian Explosives, Ltd.
- Coal Mining Machinery:**
Osborn, Sam'l (Canada) Limited.
Canadian Rock Drill Co.
Denver Rock Drill Mfg. Co., Ltd.
Canadian Ingersoll-Rand Co., Ltd.
Sullivan Machinery Co.
Marsh Engineering Works
Hadfields, Ltd.
Hendrick Mfg. Co.
Fraser & Chalmers of Canada, Limited
Mussens, Limited
R. T. Gilman & Co.
- Coal and Coke Handling Machinery**
Canadian Mead-Morrison Co., Limited.
Link-Belt Co.
- Coal Pockets:**
Canadian Mead-Morrison Co., Limited.
- Coal Pick Machines:**
Sullivan Machinery Co.
- Coal Screening Plants:**
Canadian Mead-Morrison Co., Limited.
- Cobalt Oxide:**
Coniagas Reduction Co.
Everitt & Co.
- Compressors—Air:**
Canadian Fairbanks-Morse Co., Ltd.
Smart-Turner Machine Co.
Canadian Ingersoll-Rand Co., Ltd.
Northern Canada Supply Co.
MacGovern & Co., Inc.
R. T. Gilman & Co.
Fraser & Chalmers of Canada, Ltd.
Musser, Limited
The Mine & Smelter Supply Co.
- Concrete Mixers:**
Canadian Fairbanks-Morse Co., Ltd.
Northern Canada Supply Co.
Gould, Shapley & Muir Co., Ltd.
MacGovern & Co., Inc.
Mussens, Limited
R. T. Gilman & Co.
- Condensers:**
Canadian Fairbanks-Morse Co., Ltd.
Smart-Turner Machine Co.
Northern Canada Supply Co.
MacGovern & Co., Inc.
- Concentrating Tables:**
The Mine & Smelter Supply Co.
Deister Concentrator Co.
The Wabi Iron Works
- Converters:**
Northern Canada Supply Co.
MacGovern & Co., Inc.
- Conveyors—McCaslin Gravity Bucket:**
Canadian Mead-Morrison Co., Limited.
- Contractors' Supplies:**
Canadian Fairbanks-Morse Co., Ltd.
- Consulters and Engineers:**
Hersey Milton Co., Ltd.
- Conveyors:**
The Mine & Smelter Supply Co.
- Conveyor Flights:**
Hendrick Mfg. Co., Ltd.
- Conveyor—Trough—Belt:**
Canadian Fairbanks-Morse Co., Ltd.
Link-Belt Co.
Hendrick Mfg. Co.
Mussens, Limited
Jones & Glasco (Roller, Belt and Chain)
Hendrick Mfg. Co.
The Wabi Iron Works
- Conical Mills:**
Hardinge Conical Mill Co.
- Copper:**
The Canada Metal Co., Ltd.
Consolidated Mining & Smelting Co.
- Cranes:**
Canadian Fairbanks-Morse Co., Ltd.
Canadian Mead-Morrison Co., Limited.
Canadian Link-Belt Company
R. T. Gilman & Co.
Smart-Turner Machine Co.
- Crane Ropes:**
Allan Whyte & Co.
Greening, B., Wire Co., Ltd.
- Crucibles:**
Canadian Fairbanks-Morse Co., Ltd.
The Mine & Smelter Supply Co.
- Crusher Balls:**
Canada Foundries & Forgings, Ltd.
Hull Iron & Steel Foundries, Limited, Hull, Que.
Osborn, Sam'l (Canada) Limited.
- Crude Oil Engines:**
Swedish Steel & Importing Co., Ltd.
- Crushers:**
Canadian Fairbanks-Morse Co., Ltd.
Canadian Steel Foundries, Ltd.
Hull Iron & Steel Foundries, Ltd.
Hardinge Conical Mill Co.
Osborn, Sam'l (Canada) Limited.
The Electric Steel & Metals Co., Ltd.
R. T. Gilman & Co.
Lyman, Ltd.
Mussens, Limited
The Mine & Smelter Supply Co.
Hadfields, Limited
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works

Surplus Machinery and Equipment Property of U.S. Government

FOR SALE

AIR COMPRESSORS

Can. Ingersoll Rand, Class P.L.B.-2, power driven, two stage, cross compound, low-pressure cylinder 16", high pressure cylinder 10", stroke 12", displacement 624 cu. ft. per min., 225 R.P.M., H.P. recommended to drive 110. Fly wheel 5' x 18", weight 1900 lbs., with vertical air receiver 42" x 10'. Capacity, 700 cu. ft. at 110 lbs. Location, Montreal, Que.

No. 8301.

Can. Ingersoll Rand, Class R.L.-3, Duplex type, steam driven, with cross-compound steam and cross-compound air cylinders. Cylinder sizes, H.P. steam 13", L.P. steam 22", H.P. air 12", L.P. air 20", stroke 16", displacement 1160. R.P.M. 200. Indicated H.P. in steam cylinders, 200 Boiler H.P. recommended. non-condensing 162-146 condensing 132-116. Fly wheel 8' dia., weight 4500 lbs. No. 8 Ingersoll Rand Air receiver. 48" x 12", and No. 1706 Ingersoll Rand aftercooler. Location, Leaside, Ont.

No. 2171

Sullivan Machinery Co., Class W.G.-3 horizontal single stage, power driven. Cylinder 12" dia., 12" stroke, displacement 345 cu. ft. R.P.M. 220. H.P. recommended. 75; terminal air pres-

sure, 120 lbs.. Fly wheel, 60" x 14½". With unloader. Location, Leaside, Ont.

No. 17897.

Can. Ingersoll Rand, Class B-3, cross compound steam driven, steam cylinders 14" x 24", air cylinders 14" x 22", high pressure 22" x 22", low pressure, displacement 1160 cu. ft., at 120 R.P.M., indicated H.P. in steam cylinders 200, steam pressure recommended 125, with water-tube inter-cooler. Location, Montreal, Que.

Two machines numbered as follows:

No. 4040.

No. 4041.

Bury Compressor Co., Class L., horizontal single stage power driven, cylinder 12" dia. by 12" stroke, displacement 310 cu. ft., R.P.M. 200, terminal air pressure 100 lbs., belt wheel 12" x 54", H.P. recommended 75. Location, Brantford, Ont.

Two machines numbered as follows:

No. 2594.

No. 2595.

(With standard Air Receivers, 42" x 10'.)

No. 2596.

No. 2597.

We issue a weekly Bulletin, which shows the materials available for sale at date of issue. If you are not on our Mailing List, we request your name and address.

Toronto District Salvage Board, Ordnance Dept., U.S. Army

39 Adelaide St., E.,

TORONTO, Ontario

Canadian Miners' Buying Directory.—(Continued)

- Cyanide:**
American Cyanamid Company.
- Cyanide Plant Equipment:**
The Dorr Co.
The Mine & Smelter Supply Co.
- D. C. Units:**
MacGovern Co.
- Derricks:**
Smart-Turner Machine Co.
Canadian Mead-Morrison Co., Limited.
Marsh Engineering Works
R. T. Gilman & Co.
Canadian Fairbanks-Morse Co., Ltd.
Mussens, Limited
- Diamond Drill Contractors:**
Diamond Drill Contracting Co.
E. J. Longyear Company
Smith & Travers
Sullivan Machinery Co.
- Diamond Tools:**
Diamond Drill Carbon Co.
- Diamond Importers:**
Diamond Drill Carbon Co.
- Digesters:**
Canadian Chicago Bridge and Iron Works
- Dies:**
Canada Foundries & Forgings, Ltd.
Hull Iron & Steel Foundries, Ltd.
- Dredger Pins:**
Canadian Steel Foundries, Ltd.
Hull Iron & Steel Foundries, Ltd.
The Electric Steel & Metals Co.
Hadfields, Limited
- Dredging Machinery:**
Canadian Steel Foundries, Ltd.
Canadian Mead-Morrison Co., Limited.
Hadfields, Limited
Hull Iron & Steel Foundries, Ltd.
R. T. Gilman & Co.
- Dredging Ropes:**
Allan, Whyte & Co.
Greening, B., Wire Co., Ltd.
R. T. Gilman & Co.
- Drills, Air and Hammer:**
Canadian Ingersoll-Rand Co., Ltd.
Canadian Rock Drill Co.
Denver Rock Drill Mfg. Co., Ltd.
Sullivan Machinery Co.
Northern Canada Supply Co.
Osborn, Sam'l (Canada) Limited.
The Mine & Smelter Supply Co.
Mussens, Limited
- Drills—Core:**
Canadian Ingersoll-Rand Co., Ltd.
E. J. Longyear Company
Standard Diamond Drill Co.
Sullivan Machinery Co.
- Drills—Diamond:**
Sullivan Machinery Co.
Northern Canada Supply Co.
E. J. Longyear Company
- Drill Steel—Mining:**
H. A. Drury Co., Ltd.
Hadfields, Limited
International High Speed Steel Co., Rockaway, N.J.
Osborn, Sam'l (Canada) Limited.
Mussens, Limited
Swedish Steel & Importing Co., Ltd.
- Drill Steel Sharpeners:**
Canadian Ingersoll-Rand Co., Ltd.
Canadian Rock Drill Co.
Denver Rock Drill Mfg. Co., Ltd.
Northern Canada Supply Co.
Sullivan Machinery Co.
Osborn, Sam'l (Canada) Limited.
The Wabi Iron Works
- Drills—Electric:**
Canadian Fairbanks-Morse Co., Ltd.
Sullivan Machinery Co.
Northern Electric Co., Ltd.
- Drills—High Speed and Carbon:**
Canadian Fairbanks-Morse Co., Ltd.
Osborn, Sam'l (Canada) Limited.
H. A. Drury Co., Ltd.
Hadfields, Limited
- Dynamite:**
Canadian Explosives
Northern Canada Supply Co.
- Dynamos:**
Canadian Fairbanks-Morse Co., Ltd.
MacGovern & Company
- Ejectors:**
Canadian Fairbanks-Morse Co., Ltd.
Canadian Ingersoll-Rand Co., Ltd.
Northern Canada Supply Co.
- Elevators:**
Canadian Mead-Morrison Co., Limited.
Sullivan Machinery Co.
Northern Canada Supply Co.
Hadfields, Limited
Fraser & Chalmers of Canada, Ltd.
Mussens, Limited
The Wabi Iron Works
- Engineering Instruments:**
C. L. Berger & Sons
- Engines—Automatic:**
Canadian Fairbanks-Morse Co., Ltd.
Canadian Mead-Morrison Co., Limited.
Fraser & Chalmers of Canada, Ltd.
- Engines—Gas and Gasoline:**
Canadian Fairbanks-Morse Co., Ltd.
Alex. Fleck
Fraser & Chalmers of Canada, Ltd.
Osborn, Sam'l (Canada) Limited.
Sullivan Machinery Co.
Gould, Shapley & Muir Co., Ltd.
MacGovern & Co., Inc.
The Mine & Smelter Supply Co.
- Engines—Haulage:**
Canadian Ingersoll-Rand Co., Ltd., Montreal, Que.
Canadian Mead-Morrison Co., Limited.
Marsh Engineering Works
Fraser & Chalmers of Canada, Ltd.
- Engines—Marine:**
Canadian Fairbanks-Morse Co., Ltd.
MacGovern & Co., Inc.
Swedish Steel & Importing Co., Ltd.
- Engines—Steam:**
Canadian Fairbanks-Morse Co., Ltd.
Canadian Mead-Morrison Co., Limited.
R. T. Gilman & Co.
MacGovern & Co., Inc.
Fraser & Chalmers of Canada, Ltd.
- Engines—Stationary:**
Swedish Steel & Importing Co., Ltd.
- Engineers:**
The Dorr Co.
- Ferro-Alloys (all Classes):**
Everitt & Co.
- Feed Water Heaters:**
MacGovern & Co.
- Flashlights—Electric:**
Spielman Agencies, Regd.
- Flood Lamps:**
Northern Electric Co., Ltd.
- Flourspar:**
The Consolidated Mining & Smelting Co.
Everitt & Co.
- Forges:**
Canadian Fairbanks-Morse Co., Ltd.
Northern Canada Supply Co.
- Forging:**
Canadian Mead-Morrison Co., Limited.
Canadian Foundries and Forgings, Ltd.
Hull Iron & Steel Foundries, Ltd.
Smart-Turner Machine Co.
Hadfields, Limited
Fraser & Chalmers of Canada, Ltd.
- Frogs:**
Canadian Steel Foundries, Ltd.
Hull Iron & Steel Foundries, Ltd.
John J. Gartshore
- Frequency Changers:**
MacGovern & Co., Inc.
- Furnaces—Assay:**
Canadian Fairbanks-Morse Co., Ltd.
Lymans, Limited
Mine & Smelter Supply Co.
- Fuse:**
Canadian Explosives
Northern Canada Supply Co.
- Gears (Cast):**
Hull Iron & Steel Foundries, Ltd.
The Link-Belt Co.
- Gears, Machine Cut:**
Canadian Fairbanks-Morse Co., Ltd.
Canadian Steel Foundries, Ltd.
The Electric Steel & Metals Co.
The Hamilton Gear & Machine Co.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works
- Granulators:**
Hardinge Conical Mill Co.
- Grinding Wheels:**
Canadian Fairbanks-Morse Co., Ltd.
- Gold Refiners**
Goldsmith Bros

Canadian Miners' Buying Directory.—(Continued)

- Gold Trays:**
Canada Chicago Bridge & Iron Works
- Hose (Air Drill):**
Goodyear Tire & Rubber Co.
- Hose (Fire):**
Goodyear Tire & Rubber Co.
- Hose (Packings)**
Goodyear Tire & Rubber Co.
- Hose (Suction):**
Goodyear Tire & Rubber Co.
- Hose (Steam):**
Goodyear Tire & Rubber Co.
- Hose (Water):**
Goodyear Tire & Rubber Co.
- Hammer Rock Drills:**
Canadian Rock Drill Co.
Denver Rock Drill Mfg. Co., Ltd.
Osborn, Sam'l (Canada) Limited.
Mussens, Limited
The Mine & Smelter Supply Co.
- Hangers and Cable:**
Standard Underground Cable Co. of Canada, Ltd.
- High Speed Steel:**
Canadian Fairbanks-Morse Co. Ltd.
H. A. Drury Co., Ltd.
Osborn, Sam'l (Canada) Limited.
Hadfields, Limited
International High Speed Steel Co., Rockaway, N.J.
- High Speed Steel Twist Drills:**
Canadian Fairbanks-Morse Co., Ltd.
H. A. Drury Co., Ltd.
Northern Canada Supply Co.
Osborn, Sam'l (Canada) Limited.
- Hoists—Air, Electric and Steam:**
Canadian Ingersoll-Rand Co., Ltd.
Canadian Fairbanks-Morse Co., Ltd.
Canadian Rock Drill Co.
Denver Rock Drill Mfg. Co., Ltd.
Jones & Glassco
Canadian Mead-Morrison Co., Limited.
Marsh Engineering Works
Northern Canada Supply Co.
Mine & Smelter Supply Co.
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
The Wabi Iron Works
R. T. Gilman & Co.
Mussens, Limited
Link-Belt Co.
- Hoisting Engines:**
Canadian Fairbanks-Morse Co., Ltd.
Canadian Rock Drill Co.
Denver Rock Drill Mfg. Co., Ltd.
The Electric Steel & Metals Co.
Mussens, Limited
Sullivan Machinery Co.
Canadian Ingersoll-Rand Co., Ltd.
Canadian Mead-Morrison Co., Limited.
Marsh Engineering Works
Fraser & Chalmers of Canada, Ltd.
The Mine & Smelter Supply Co.
- Hoisting Towers:**
Canadian Mead-Morrison Co., Limited.
- Hose:**
Canadian Fairbanks-Morse Co., Ltd.
Northern Canada Supply Co
- Hydraulic Machinery:**
Canadian Fairbanks-Morse Co., Ltd.
Hadfields, Limited
MacGovern & Co., Inc.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works
- Industrial Chemists:**
Hersey, M. & Co., Ltd.
- Ingot Copper:**
Canada Metal Co., Ltd.
Hoyt Metal Co.
- Insulating Compounds:**
Standard Underground Cable Co. of Canada, Ltd.
- Inspection and Testing:**
Dominion Engineering & Inspection Co.
- Inspectors:**
Hersey, M. & Co., Ltd.
- Jacks:**
Canadian Fairbanks-Morse Co., Ltd.
Can. Brakeshoe Co., Ltd.
Northern Canada Supply Co.
R. T. Gilman & Co.
Mussens, Limited
- Jack Screws:**
Canadian Foundries and Forgings, Ltd.
- Laboratory Machinery:**
Mine & Smelter Supply Co.
- Lamps—Acetylene:**
Dewar Manufacturing Co., Inc.
- Lamps—Carbide:**
Dewar Manufacturing Co., Inc.
- Lamps—Miners:**
Canada Carbide Company, Limited
Canadian Fairbanks-Morse Co., Ltd.
Dewar Manufacturing Co., Inc.
Northern Electric Co., Ltd.
Mussens, Limited
- Lamps:**
Dewar Manufacturing Co., Inc.
- Lanterns—Electric:**
Spielman Agencies, Regd.
- Lead (Pig):**
The Canada Metal Co., Ltd.
Consolidated Mining & Smelting Co.
- Levels:**
C. L. Berger & Sons
- Locomotives (Steam, Compressed Air and Storage Steam):**
Canadian Fairbanks-Morse Co., Ltd.
H. K. Porter Company
R. T. Gilman & Co.
Fraser & Chalmers of Canada, Ltd.
Mussens, Limited
- Link Belt**
Canadian Fairbanks-Morse Co. Ltd.
Northern Canada Supply Co.
Jones & Glassco
- Machinists:**
Burnett & Crampton
- Machinery—Repair Shop:**
Canadian Fairbanks-Morse Co., Ltd.
- Machine Shop Supplies:**
Canadian Fairbanks-Morse Co., Ltd.
- Magnesium Metal:**
Everitt & Co.
Hull Iron & Steel Foundries, Ltd.
- Manganese Steel:**
Canadian Steel Foundries, Ltd.
The Electric Steel & Metals Co.
Hadfields, Limited
Osborn, Sam'l (Canada) Limited.
Hull Iron & Steel Foundries, Ltd.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works
- Metal Marking Machinery:**
Canadian Fairbanks-Morse Co., Ltd.
- Metal Merchants:**
Henry Bath & Son
Geo. G. Blackwell, Sons & Co.
Coniagas Reduction Co.
Consolidated Mining & Smelting Co. of Canada
Canada Metal Co.
C. L. Constant Co.
Everitt & Co
- Metallurgical Engineers:**
The Dorr Co.
- Metallurgical Machinery:**
The Dorr Co.
The Mine & Smelter Supply Co.
- Metal Work, Heavy Plates:**
Canada Chicago Bridge & Iron Works
- Mica:**
Everitt & Co.
Diamond Drill Carbon Co.
- Mining Engineers:**
Hersey, M. Co., Ltd.
- Mining Drill Steel:**
H. A. Drury Co., Ltd.
Osborn, Sam'l (Canada) Limited.
International High Speed Steel Co., Rockaway, N.J.
- Mining Requisites:**
Canadian Steel Foundries, Ltd.
Dominion Wire Rope Co., Ltd.
Hadfields, Limited
Osborn, Sam'l (Canada) Limited.
Hull Iron & Steel Foundries, Ltd.
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
The Wabi Iron Works
- Mining Ropes:**
Dominion Wire Rope Co., Ltd.
- Mine Surveying Instruments:**
C. L. Berger & Sons
- Molybdenite:**
Everitt & Co.
- Monel Metal (Wire, Rod, Sheet and Foundry Metal):**
International Nickel Co.
- Motors:**
Canadian Fairbanks-Morse Co., Ltd.
R. T. Gilman & Co.
MacGovern & Co.
The Mine & Smelter Supply Co.
The Wabi Iron Works

Canadian Miners' Buying Directory.—(Continued)

Motor Generator Sets—A.C. and D.C.
MacGovern & Co.

Nails:
Canada Metal Co.

Nickel:
International Nickel Co.
Coniagas Reduction Co.
The Mond Nickel Co., Ltd.

Nickel Anodes:
The Mond Nickel Co., Ltd.

Nickel Salts:
The Mond Nickel Co., Ltd.

Nickel Sheets:
The International Nickel Co. of Canada.
The Mond Nickel Co., Ltd.

Nickel Wire:
The Mond Nickel Co., Ltd.
The International Nickel Co. of Canada

Oil Analysts:
Constant, C. L. Co.

Ore Handling Equipment:
Canadian Mead-Morrison Co., Limited.

Ore Sacks:
Northern Canada Supply Co.

Ore Testing Works:
Ledoux & Co.
Can. Laboratories
Milton Hersey Co.
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
Oxford Copper Co.
Canada Metal Co.
Hoyt Metal Co.
Everitt & Co.
Pennsylvania Smelting Co.

Packing:
Canadian Fairbanks-Morse Co., Ltd.

Paints—Special:
Spielman Agencies, Regd.

Perforated Metals:
Northern Canada Supply Co.
Hendrick Mfg. Co.
Canada Wire and Iron Goods Company.
Greening, B., Wire Co.

Pig Tin:
Canada Metal Co., Ltd.
Hoyt Metal Co.

Pig Lead:
Canada Metal Co., Ltd.
Hoyt Metal Co.
Pennsylvania Manufacturing Co.

Pillow Blocks:
Canadian Link-Belt Company

Pipes:
Canadian Fairbanks-Morse Co., Ltd.
Canada Metal Co., Ltd.
Consolidated M. & S. Co.
Northern Canada Supply Co.
R. T. Gilman & Co.

Pipe Fittings:
Canadian Fairbanks-Morse Co., Ltd.

Pipe—Wood Stave:
Pacific Coast Pipe Co.
Mine & Smelter Supply Co.

Piston Rock Drills:
Mussens, Limited
Mine & Smelter Supply Co.

Plate Works:
John Inglis Co., Ltd.
Hendrick Mfg. Co.
The Wabi Iron Works
MacKinnon Steel Co., Ltd.

Platinum Refiners:
Goldsmith Bros.

Pneumatic Tools:
Canadian Ingersoll-Rand Co., Ltd.
Jones & Glassco
R. T. Gilman & Co.

Prospecting Mills and Machinery:
The Electric Steel & Metals Co.
E. J. Longyear Company
Standard Diamond Drill Co.
Mine & Smelter Supply Co.
Fraser & Chalmers of Canada, L.
The Wabi Iron Works

Pumps—Pneumatic:
Canadian Fairbanks-Morse Co., Ltd.
Smart-Turner Machine Co.
Sullivan Machinery Co.

Pumps—Steam:
Canadian Fairbanks-Morse Co., Ltd.
Canadian Ingersoll-Rand Co., Ltd.
The Electric Steel & Metals Co.
The Mine & Smelter Supply Co.
Mussens, Limited
Northern Canada Supply Co.
Smart-Turner Machine Co.
R. T. Gilman & Co.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works

Pumps—Turbine:
Canadian Fairbanks-Morse Co., Ltd.
Smart-Turner Machine Co.
Canadian Ingersoll-Rand Co., Ltd.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works

Pumps—Vacuum:
Canadian Fairbanks-Morse Co., Ltd.
Smart-Turner Machine Co.
The Wabi Iron Works

Pumps—Valves:
Canadian Fairbanks-Morse Co., Ltd.

Pulleys, Shaftings and Hangings:
Northern Canada Supply Co.
Canadian Fairbanks-Morse Co., Ltd.
The Wabi Iron Works

Pulverizers—Laboratory:
Mine & Smelter Supply Co.
The Wabi Iron Works
Hardinge Conical Mill Co.

Pumps—Boiler Feed:
Smart-Turner Machine Co.
Northern Canada Supply Co.
Canadian Fairbanks-Morse Co., Ltd.
Fraser & Chalmers of Canada, Ltd.
Mussens, Limited
Mine & Smelter Supply Co.

Pumps—Centrifugal:
Canadian Fairbanks-Morse Co., Ltd.
The Electric Steel & Metals Co.
Smart-Turner Machine Co.
Canadian Mead-Morrison Co., Limited.
Canadian Ingersoll-Rand Co., Ltd.
Mine & Smelter Supply Co.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works

Pumps—Diaphragm
The Dorr Company

Pumps—Electric
Canadian Fairbanks-Morse Co., Ltd.
Fraser & Chalmers of Canada, Ltd.
Mussens, Limited
Smart-Turner Machine Co.

Pumps—Sand and Slime:
Canadian Fairbanks-Morse Co., Ltd.
Fraser & Chalmers of Canada, Ltd.
Mine & Smelter Supply Co.
The Electric Steel & Metals Co.
The Wabi Iron Works
Smart-Turner Machine Co.

Quarrying Machinery:
Canadian Rock Drill Co.
Denver Rock Drill Mfg. Co., Ltd.
Sullivan Machinery Co.
Canadian Ingersoll-Rand Co., Ltd.
Hadfields, Limited
Mussens, Limited
R. T. Gilman Co.

Rails:
Hadfields, Limited
John J. Gartshore
R. T. Gilman & Co.
Mussens, Limited

Railway Supplies:
Canadian Fairbanks-Morse Co., Ltd.

Refiners:
Goldsmith Bros.

Riddles:
Hendrick Mfg. Co.

Roofing:
Canadian Fairbanks-Morse Co., Ltd.
Northern Canada Supply Co.

Rope—Manilla:
Osborn, Sam'l (Canada) Limited.
Mussens, Limited

Rope—Manilla and Jute:
Jones & Glassco
Northern Canada Supply Co.
Osborn, Sam'l (Canada) Limited.
Allan, Whyte & Co.

Canadian Miners' Buying Directory.—(Continued)

- Rope—Wire:**
Allan, Whyte & Co.
Dominion Wire Rope Co., Ltd.
Greening, B. Wire Co.
Northern Canada Supply Co.
Mussens, Limited
- Rolls—Crushing**
Canadian Steel Foundries, Ltd.
Fraser & Chalmers of Canada, Ltd.
Hull Iron & Steel Foundries, Ltd.
Osborn, Sam'l (Canada) Limited.
Hadfields, Limited
The Electric Steel & Metals Co.
Mussens, Limited
The Wabi Iron Works
- Samplers:**
Fraser & Chalmers of Canada, Ltd.
C. L. Constant Co.
Ledoux & Co.
Milton Hersey Co.
Thos. Heyes & Son
Mine & Smelter Supply Co.
Mussens, Limited
- Scales—(all kinds):**
Canadian Fairbanks-Morse Co., Ltd.
- Screens:**
Greening, B. Wire Co.
Hendrick Mfg. Co.
Mine & Smelter Supply Co.
Canada Wire and Iron Goods Company.
Link-Belt Co.
- Screens—Cross Patent Flanged Lip:**
Hendrick Mfg. Co.
- Screens—Perforated Metal:**
Hendrick Mfg. Co.
- Screens—Shaking:**
Hendrick Mfg. Co.
- Screens—Revolving:**
Hendrick Mfg. Co.
- Scheelite:**
Everitt & Co.
- Separators:**
Canadian Fairbanks-Morse Co., Ltd.
Smart-Turner Machine Co.
Mine & Smelter Supply Co.
- Shaft Contractors:**
Hendrick Mfg. Co.
- Sheet Metal Work:**
Hendrick Mfg. Co.
- Sheets—Genuine Manganese Bronze:**
Hendrick Mfg. Co.
- Shoes and Dies:**
Canadian Foundries and Forgings, Ltd.
H. A. Drury Co., Ltd.
Fraser & Chalmers of Canada, Ltd.
Hull Iron & Steel Foundries, Ltd.
The Electric Steel & Metals Co.
The Wabi Iron Works
- Shovels—Steam:**
Canadian Foundries and Forgings, Ltd.
Canadian Mead-Morrison Co., Limited.
Osborn, Sam'l (Canada) Limited.
R. T. Gilman & Co.
- Ship Bunkering Equipment:**
Canadian Mead-Morrison Co., Limited.
- Siline:**
Coniagas Reduction Co.
- Saline Refiners:**
Goldsmith Bros.
- Smelters:**
Goldsmith Bros.
- Sledges:**
Canada Foundries & Forgings, Ltd.
- Smoke Stacks:**
Hendrick Mfg. Co.
MacKinnon Steel Co., Ltd.
Marsh Engineering Works
The Wabi Iron Works
- Special Machinery:**
John Inglis Co., Ltd.
- Spelter:**
The Canada Metal Co., Ltd.
Consolidated Mining & Smelting Co.
- Sprockets:**
Link-Belt Co.
- Spring Coil and Clips Electrico:**
Canadian Steel Foundries, Ltd.
- Steel Barrels:**
Smart-Turner Machine Co.
Fraser & Chalmers of Canada, Ltd.
- Stamp Forgings:**
Canada Foundries & Forgings, Ltd.
Hull Iron & Steel Foundries, Ltd.
- Steel Castings:**
Canadian Brakeshoe Co., Ltd.
Canadian Steel Foundries, Ltd.
Fraser & Chalmers of Canada, Ltd.
Osborn, Sam'l (Canada) Limited.
Hull Iron & Steel Foundries, Ltd.
The Electric Steel & Metals Co.
Hadfields, Limited
The Wabi Iron Works
- Steel Drills:**
Canadian Fairbanks-Morse Co., Ltd.
Canadian Rock Drill Co.
Denver Rock Drill Mfg. Co., Ltd.
Sullivan Machinery Co.
Northern Canada Supply Co.
The Electric Steel & Metals Co.
Osborn, Sam'l (Canada) Limited.
Canadian Ingersoll-Rand Co., Ltd.
Mussens, Limited
Swedish Steel & Importing Co., Ltd.
- Steel Drums:**
Smart-Turner Machine Co.
- Steel—Tool:**
Canadian Fairbanks-Morse Co., Ltd.
H. A. Drury Co., Ltd.
N. S. Steel & Coal Co.
Osborn, Sam'l (Canada) Limited.
Hadfields, Limited
Swedish Steel & Importing Co., Ltd.
- Structural Steel Work (Light):**
Hendrick Mfg. Co.
- Stone Breakers:**
Hadfields, Limited
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
Osborn, Sam'l (Canada) Limited.
Mussens, Limited
R. T. Gilman & Co.
The Wabi Iron Works
- Sulphate of Copper:**
The Mond Nickel Co., Ltd.
Coniagas Reduction Co.
- Sulphate of Nickel:**
The Mond Nickel Co., Ltd.
- Surveying Instruments:**
C. L. Berger
- Switches and Switch Stand:**
Canadian Steel Foundries, Ltd.
Mussens, Limited.
- Switches and Turntables:**
John J. Gartshore
- Tables—Concentrating:**
Mine & Smelter Supply Co.
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
- Tanks:**
R. T. Gilman & Co.
- Tanks—Acid:**
Canadian Chicago Bridge & Iron Works
The Mine & Smelter Supply Co.
- Tanks (Wooden):**
Canadian Fairbanks-Morse Co., Ltd.
Gould, Shapley & Muir Co., Ltd.
Pacific Coast Pipe Co., Ltd.
Mine & Smelter Supply Co.
The Wabi Iron Works
- Tanks—Cyanide, Etc.:**
Hendrick Mfg. Co.
Pacific Coast Pipe Co.
MacKinnon Steel Co.
Fraser & Chalmers of Canada, Ltd.
Mine & Smelter Supply Co.
The Wabi Iron Works
- Tanks—Steel:**
Canadian Fairbanks-Morse Co., Ltd.
Canadian Ingersoll-Rand Co., Ltd.
Canadian Chicago Bridge & Iron Works
Marsh Engineering Works
Osborn, Sam'l (Canada) Limited.
MacKinnon Steel Co.
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
Hendrick Mfg. Co.
The Wabi Iron Works
- Tanks—Oil Storage:**
Canadian Chicago Bridge & Iron Works
The Mine & Smelter Supply Co.
- Tanks (water) and Steel Towers:**
Canadian Fairbanks-Morse Co., Ltd.
Canadian Chicago Bridge & Iron Works
Gould, Shapley & Muir Co., Ltd.
MacKinnon Steel Co.
Mine & Smelter Supply Co.
The Wabi Iron Works

Canadian Miners' Buying Directory.—(Continued)

Tramway Points and Crossings:
Canadian Steel Foundries, Ltd.
Hadfields, Limited

Transits:
C. L. Berger & Sons

Transformers:
Canadian Fairbanks-Morse Co., Ltd.
R. T. Gilman & Co.
Northern Electric Co., Ltd.

Transmission Apparatus:
Jones & Glasco

Troughs (Conveyor):
Hendrick Manufacturing Co.

Trucks—Electric:
Canadian Fairbanks-Morse Co., Ltd.

Trucks—Hand:
Canadian Fairbanks-Morse Co., Ltd.

Trucks:
Canadian Fairbanks-Morse Co., Ltd.

Tubs:
Hadfields, Limited

Tube Mills:
The Electric Steel & Metals Co.
Fraser & Chalmers of Canada, Ltd.
Hardinge Conical Mill Co.

Tube Mill Balls:
Canada Foundries & Forgings, Ltd.
Fraser & Chalmers of Canada, Ltd.
Hull Iron & Steel Foundries, Ltd.

Tube Mill Liners:
Burnett & Crampton
Fraser & Chalmers of Canada, Ltd.
Hull Iron & Steel Foundries, Ltd.

Turbines—Water Wheel:
MacGovern & Co.

Turbines—Steam:
Fraser & Chalmers of Canada, Ltd.
MacGovern & Co.

Twincones:
Canada Foundries & Forgings, Ltd.

Uranium:
Everitt & Co.

Weighing Larries:
Canadian Mead-Morrison Co., Limited.

Welding—Rod and Flux:
Prest-O-Lite Co. of Canada, Ltd.
Imperial Brass Mfg. Co.

Welding and Cutting—Oxy-Acetylene:
Prest-O-Lite Co. of Canada, Ltd.
Canadian Fairbanks-Morse Co., Ltd.
Imperial Brass Mfg. Co.

Wheels and Axles:
Canadian Steel Foundries, Ltd.
Hadfields, Limited
The Electric Steel & Metals Co.
The Wabi Iron Works

Winches—Power Driven:
Canadian Mead-Morrison Co., Limited.

Winding Engines—Steam and Electric:
Canadian Fairbanks-Morse Co., Ltd.
Canadian Ingersoll-Rand Co., Ltd.
Marsh Engineering Works
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
Mussens, Limited
R. T. Gilman & Co.
The Wabi Iron Works

Wire:
Canada Wire & Cable Co., Ltd.
Greening, B. Wire Co.

Wire Rope:
R. T. Gilman & Co.
Canada Wire and Iron Goods Company.
Dominion Wire Rope Co., Ltd.

Wire Rope Fittings:
Canada Wire and Iron Goods Company.

Wire Cloth:
Northern Canada Supply Co.
Greening, B. Wire Co.
Canada Wire & Iron Goods Company

Wire (Bars and Insulated):
Standard Underground Cable Co. of Canada, Ltd.
Northern Electric Co., Ltd.

Wolfram Ore:
Everitt & Co.

Woodworking Machinery:
Canadian Fairbanks-Morse Co., Ltd.

Zirconium:
Everitt & Co.

Zinc:
The Canada Metal Co., Ltd.
Consolidated Mining & Smelting Co.

Zinc Spelter:
Canada Metal Co., Ltd.
Hoyt Metal Co., Ltd.

FOR SALE.—One Hawley-Schwartz oil fired Melting Furnace, size 60 inch, latest type, nearly new, good condition.—Monarch Metal Co., Ltd., Hamilton, Canada.

REGINALD E. HORE*Consulting Geologist*

(Specialty: Pre-Cambrian Ore Deposits)

Office: 1402 C. P. R. Bldg., TORONTO

Phone Ad. 3310

FORGINGS

SEND PRINTS FOR PRICES

CANADA

FOUNDRIES & FORGINGS, LIMITED

WELLAND, ONT.

C. L. CONSTANT CO.,

42 New Street

New York

SHIPPERS' AGENTS

FOR

**Selling, Sampling and Assaying Ore,
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

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*

THE CANADIAN MINING JOURNAL
ALPHABETICAL INDEX TO ADVERTISERS

A

Allan Whyte & Co., Ltd. 47
American Cyanamid Co.
American Zinc Lead & Smelting Co.

B

Balbach Smelting & Refining Co. . . 47
Bell, J. M. 10
Blackwell, G. G. Sons & Company. . 12
Berger, C. L. & Sons 12
Brigstocke, R. W. 11
British Columbia, Province of . . . 35
Burns, L. P., Ltd. 12
Burnett & Crampton

C

Canadian Allis-Chalmers. 31
Can. Chicago Bridge & Iron Works 13
Canadian Explosives, Ltd. 38
Canadian Fairbanks-Morse Co., Ltd.
Canadian Mead-Morrison Co., Ltd. . . 34
Canadian Milk Products, Ltd. 8
Canadian National Railways. 13
Canadian Ingersoll-Rand Co., Ltd. . . 6
Canadian Link-Belt Co., Ltd. 33
Canadian Laboratories, Ltd. 10
Canada Foundries & Forgings, Ltd. 47
Canada Wire & Iron Goods Co. 9
Canada Wire & Cable Co.
Canadian Rock Drill Co. 49
Canadian Steel Foundries, Ltd.
Canada Carbide Company
Canada Metal Co. 9
Canadian Brakeshoe Co. 37
Canadian Sirocco Co.
Capper Pass & Son, Ltd. 10
Consolidated Mining & Smelting Co. 37
Crane, Ltd. 9
Coniagas Reduction Co 40
Constant, C. L. & Co. 47

D

Denver Rock Drill Mfg. Co. 49
Deloro Smelting & Refining Co. . . 37
Dewar Mfg. Co. 37
Department of Mines, Canada 3
Diamond Drill Carbon Co. 48
Diamond Drill Contracting Co. 12
Drury, H. A. Company 8
Dominion Coal Co., Ltd. 10
Donald, J. T. & Co. 10
Dorr Co. 11
Dresser, John A. 11
Dominion Wire Rope Co., Ltd. 7
Dwight & Lloyd Sintering Co., Inc
Dominion Engineering & Inspection Co. 10

E

Electric Steel & Engineering Ltd. 1-14
Electric Steel & Metals Co. 1-14
Engineering & Machine Works of Canada 8
Everitt & Co., Ltd.

F

Fleck, Alex
Ferrier, W. F. 11
Fasken, Robertson, Chadwick & Sedgewick 10
Fraser & Chalmers of Canada, Ltd.

G

Gartshore, John J. 12
General Engineering Co. 12
Giant Powder Company
Goldie & McCulloch
Goldsmith Bros., Smelting & Refining Co., Ltd. 12
Goodyear Tire & Rubber Co. of Canada, Ltd. 36
Greening, B. Wire Co., Ltd.
Grover & Grover 10
Gutta Percha & Rubber, Ltd. 33

H

Hadfields, Ltd. 50
Hamilton Gear & Machine Co. 12
Hassan A. A. 11
Hendrick Mfg. Co. 12
Hersey, Milton Co., Ltd. 11
Heys Thomas & Son 11
Hull Iron & Steel Foundries, Ltd. . . 16
Hore, Reginald E. 47
Hoyt Metal Co. 50

I

Imperial Bank of Canada 13
Imperial Trading Co.
International Business Machines . .
International Nickel Co. of Canada, Ltd. 5
Inglis, J. & Co. 40
International Nickel Company

J

Johnston, Matthey & Co. 10
Jones & Glassco (Regd.)

L

Laurie & Lamb
Ledoux & Co. 10
Lindsey, G. G. S. 11
Longyear, E. J. Company 10
Lymans, Ltd. 13

M

Manitoba, Province of
McDonald, M. P. 11
MacGovern & Co., Inc.
MacKinnon Steel Coal Co., Ltd. . . .
Marsh Engineering Works 31
McEvoy, Jas. 11
Mine & Smelter Supply Co.
Mond Nickel Co.
Mussens, Ltd.

N

Northern Canada Supply Co.
Northern Electric Co., Ltd.
Nova Scotia Government 7
Nova Scotia Steel & Coal Co. 7

O

Ontario, Province of 4
Osborn, Sam'l Co., Ltd. 2

P

Pacific Coast Pipe Co.
Peacock Bros., Ltd. 50
Pennsylvania Smelting Co. 10
Powley & Townsley 9
Prest-O-Lite Co. of Canada 34

Q

Quebec, Province of 35

R

Ridout & Maybee 12
Rogers John C. 11
Rogers, Geo. R. 11
Reddaway, F. & Co.

S

Smart-Turner Machine Co.
Smith & Travers Company, Ltd. . . 10
Standard Underground Cable Co. of Canada, Ltd. 37
Stewart, Robert H. 11
Spielman Agencies, Regd.
Sudbury Diamond Drilling Co., Ltd. 10
Sullivan Machinery Co.
Swedish Steel & Importing Co. . .
Swedish Steel (Bolinder's)

T

Toronto Iron Works
Toronto District Salvage Board . . 42
Tyrrell, J. B. 11

U

University of Toronto. 37

W

Whitman, Alfred R. 11

Good Cores

Can only be obtained if proper care be exercised in the selection of diamonds. We are always ready to give our customers the benefit of our experience when selecting stones.

Write or wire at our expense for particulars.


THE DIAMOND DRILL CARBON CO.

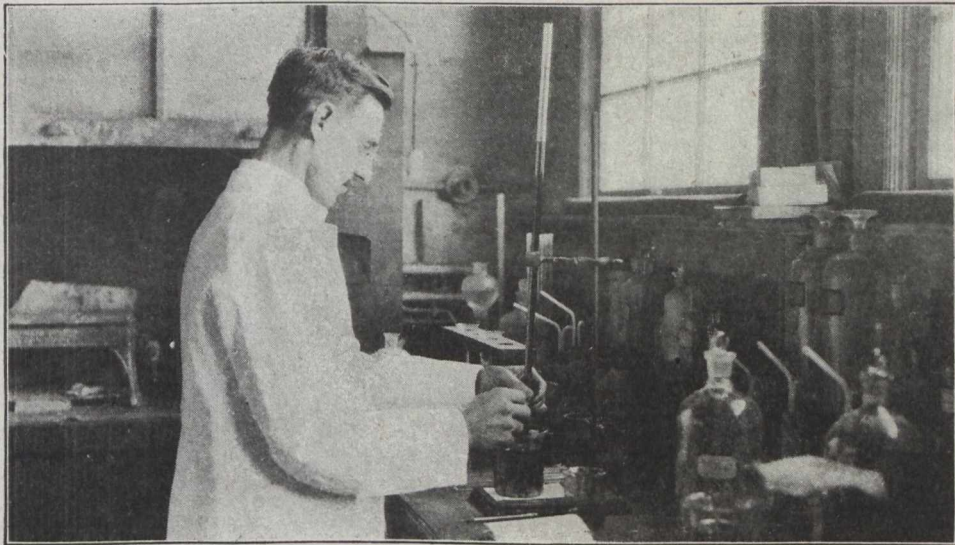
Direct Importers

GARBONS of BORTZ

BALLAS

61 PARK ROW
New York - N.Y.





“The Acid Test”

THE ACID TEST of a rock drill is its performance on the job, and Waugh drills in every instance meet this test so satisfactorily that the best mines the world over are specifying “all-Waugh” equipment.

One reason for their unusual efficiency is that every step in the manufacture of these remarkable drills is carefully followed by the watchful eyes of expert Waugh chemists who immediately reject any and all material that contains even the slightest imperfection.

This is only one of many tests applied in the manufacture of Waugh products to insure to the customer the best machine scientifically attainable.

Is your mine “all-Waugh-equipped” yet?

Canadian Rock Drill Company, Limited

TORONTO, ONT.
COBALT, ONT.

NELSON, B.C.
VANCOUVER, B.C.

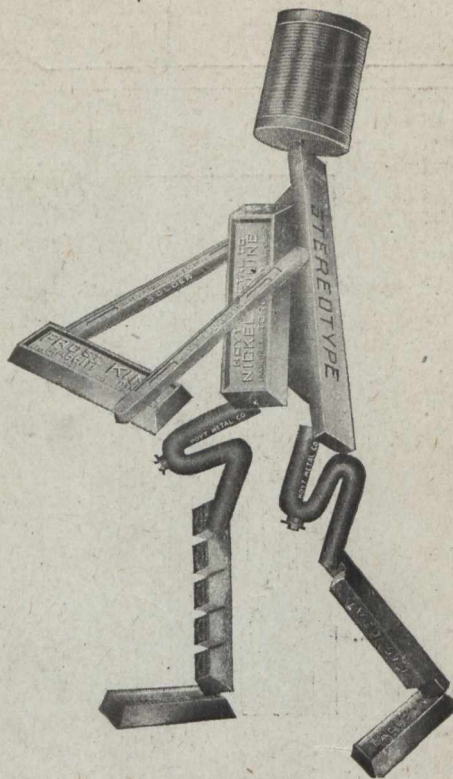
Sole Agents in Canada for

THE DENVER ROCK DRILL MANUFACTURING COMPANY
OF DENVER, COLORADO, U.S.A.

THE METALMAN

recommends Frost King

This is the Babbitt Metal which relieves the master mechanic from worry over bearing troubles. For rolling mills, stationary engines and general utility purposes it is without a peer.

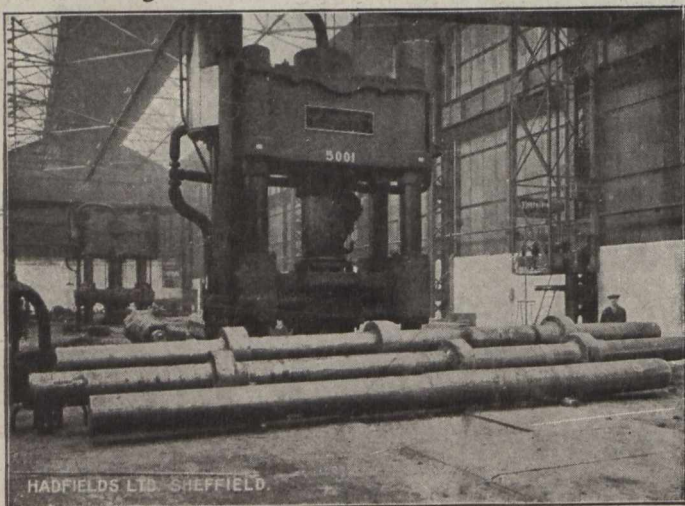


HOYT METAL COMPANY
 MONTREAL TORONTO WINNIPEG

HADFIELDS Ltd.

Workmen employed 15,000 East Hecla and Hecla Works, SHEFFIELD, England Works area over 200 acres

Sole Agents: PEACOCK BROTHERS, Limited, 179 Delorimier Avenue, MONTREAL



HADFIELDS LTD. SHEFFIELD

"HECLA" STEEL FORGINGS

in the rough, rough machined, or finished,
 FOR MARINE AND OTHER ENGINEERING PURPOSES
 of any analysis and to pass any required test.

INGOTS, BLOOMS, SLABS
 made by the
 OPEN HEARTH OR ELECTRIC PROCESS



(Trade Mark)

Sole Makers of Hadfield's Patent
MANGANESE STEEL
 THE SUPREME MATERIAL

for
 Railway and Tramway Special Track-
 work, also Wearing Parts of Stone
 Breaking and Ore Crushing Machinery,
 etc.

Hadfield's "Heclon Superior" High-Speed Tool Steel

The finest air hardening steel for machining the hardest and toughest material

SPECIAL ALLOY HIGH TENSILE STEELS for Aircraft and Motor Car Engines

Makers of the best kinds of
STONE BREAKING & ORE CRUSHING MACHINERY

MINING REQUISITES
 of every description