

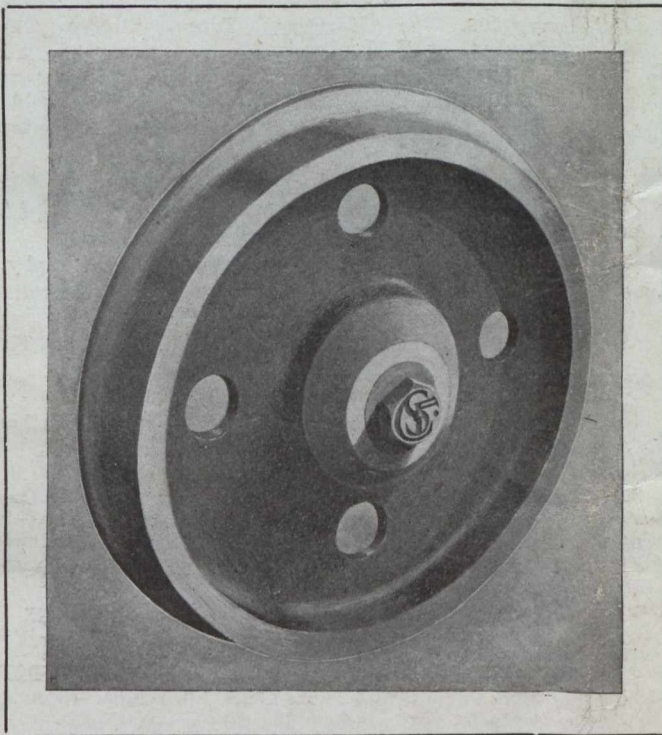
# CANADIAN MINING JOURNAL

Vol. XL

GARDEN CITY PRESS, Ste. Anne de Bellevue, SEPTEMBER 3, 1919.

No. 35

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### 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.

Occurrences and Testing of Foundry Moulding Sands. Bulletin No. 21, by L. H. Cole, 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, 1917.

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 95. Onaping Map-Area, by W. H. Collins.  
Memoir 105. Amisk-Athapapuskw Lake district, by E. L. Bruce.

Memoir 107. Road materials in the vicinity of Regina, Saskatchewan, by L. Reinecke.

Memoir 108. The Mackenzie River basin, by Charles Camsell 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 112. Geology of the district belt of southwestern Alberta, by J. S. Stewart.

Map 42A. Duncan sheet, Vancouver Island. Geology.

Map 44A. Sooke sheet, Vancouver Island. Geology.

Map 115A. Sheep river, Alberta. Topography.

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

Map 179A. Onaping; Sudbury and Timiskaming districts, Ont. Geology.

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.

Maps 1697 and 1698. Explored routes in a belt traversed by the Canadian Northern Ontario railway,—in two sheets: Sheet 1 Gogama to Missonga, Sudbury district; Sheet 2 Oatland to Penhurst, Algoma district, Ontario.

Map 1690. Whiteburn Gold District, N.S. Geology.

Map 1702. Klotassin, Yukon Territory. Geology.

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

Map 1710. Bothwell-Thamesville oil region, Kent county, Ontario.

Map 1712. Foothills of Southern Alberta, St. Mary river to Hig:wood river. Geology.

Map 1714. The Niagara peninsula, Ontario. Geology.

Map 1715. The Ontario peninsula. Geology.

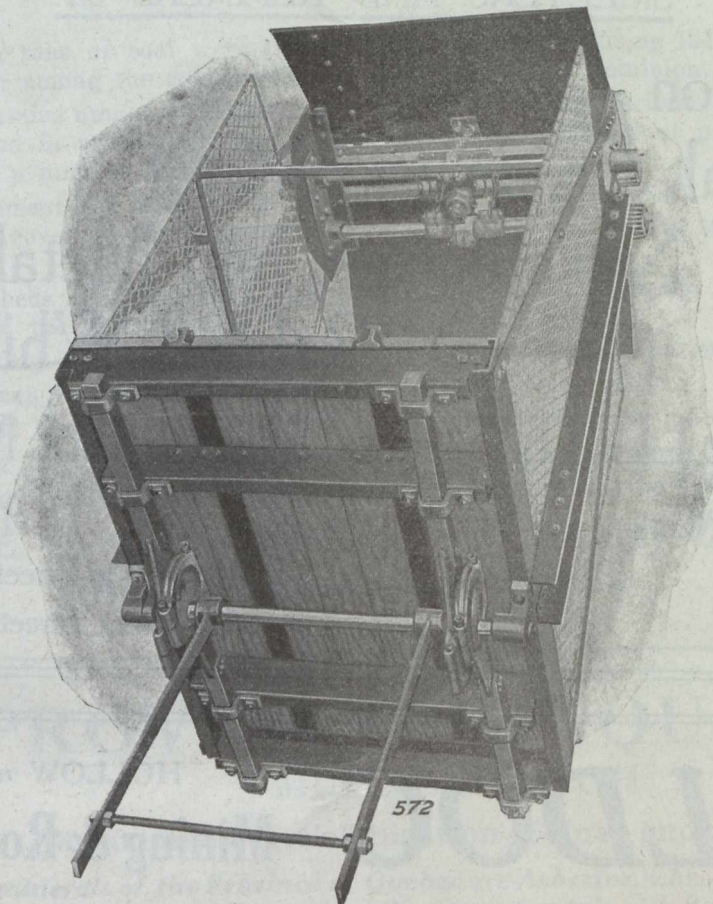
Applicants for publications not listed above should mention the precise area concerning which information is desired.

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.



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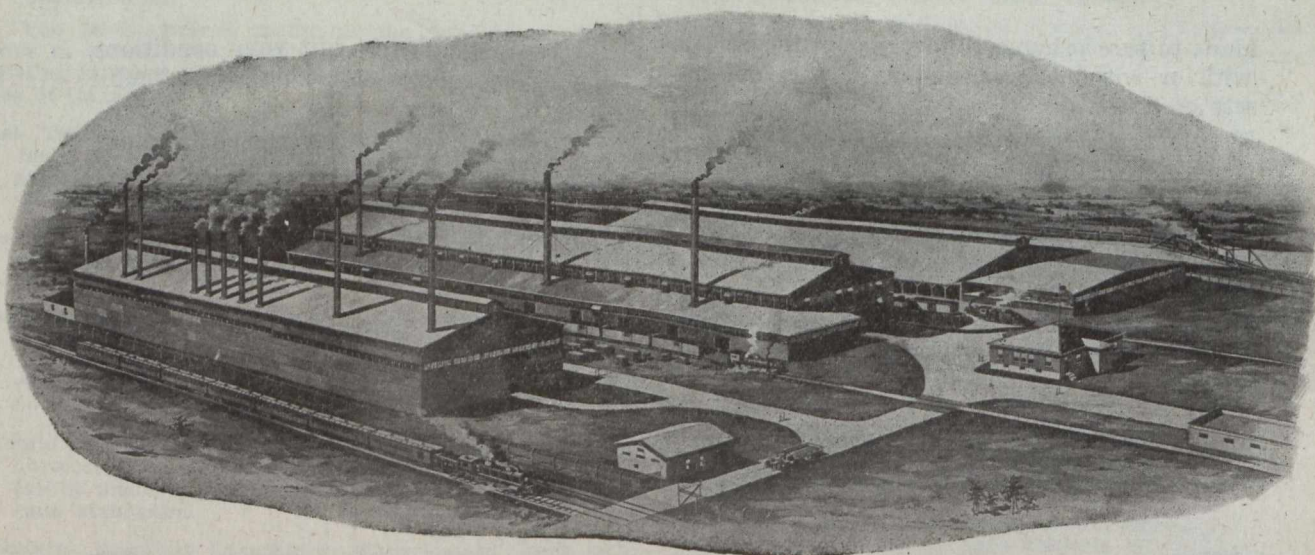
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**Iron** The province contains numerous districts in which occur various varieties of iron ore, practically at tide water and in touch with vast bodies of fluxes. Deposits of particularly high grade manganese ore occur at a number of different locations.

**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.

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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

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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 HONORE MERCIER,

MINISTER OF COLONIZATION, MINES AND FISHERIES, QUEBEC.

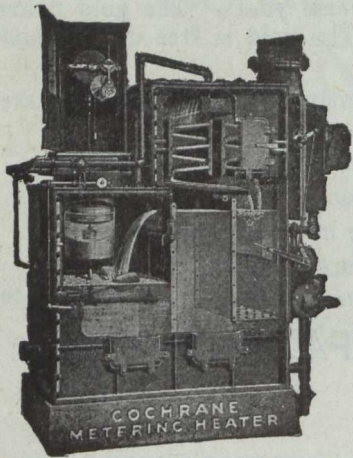


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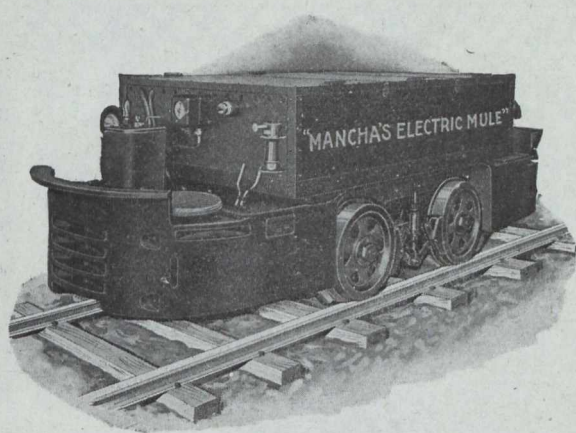
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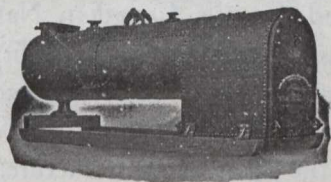
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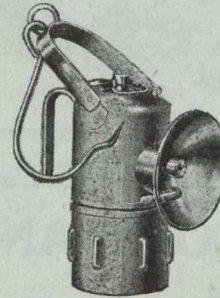
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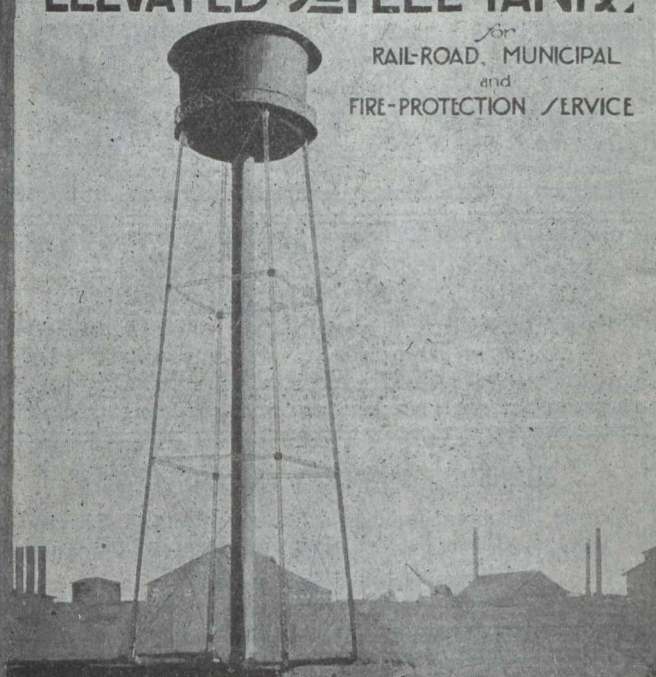
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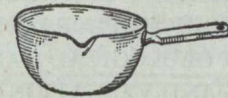


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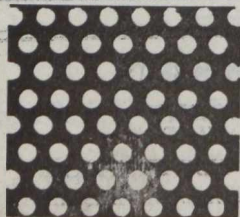
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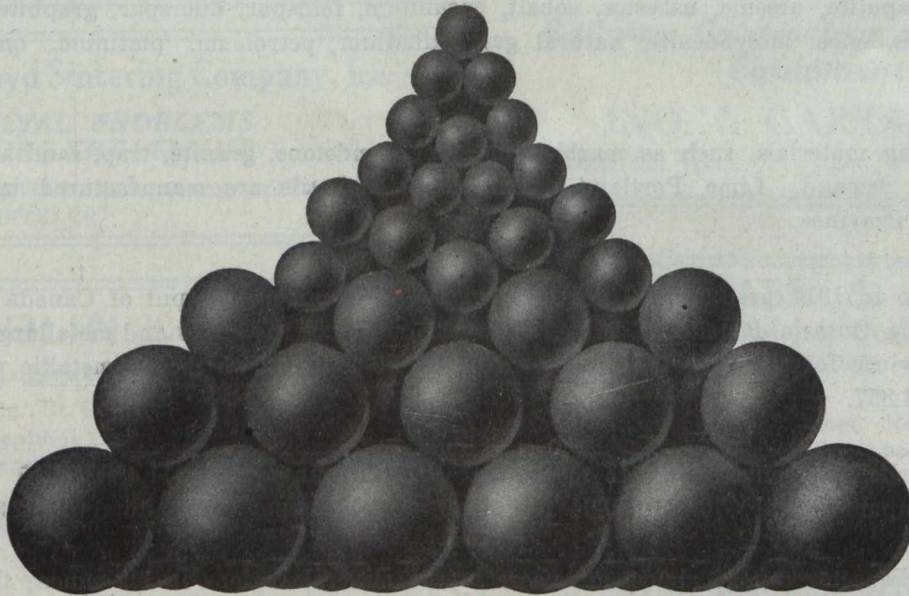


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## CONTENTS

### Editorial:

The Prince of Wales . . . . .	653
Hoisting Men in British Columbia Mines New Safeguards . . . . .	653
Mining Courses for Working Miners . . . . .	653
Ruin and Restitution in France . . . . .	654
"Wild Cats" . . . . .	654

### Articles:

The Geology of Ontario as it affects Gas and Oil Production, by Dr. M. Y. Williams . . . . .	655
Ruin and Restitution in France, illustrated by original photographs, by courtesy of "Mining and Scientific Press" . . . . .	661

### Special Correspondence:

Northern Ontario . . . . .	662
British Columbia . . . . .	665
Prosecution for Breach of Ontario Mine Law governing Man Cages . . . . .	662
B. C. Regulations concerning Winding Ropes and Cages . . . . .	670
Coal Production in Alberta . . . . .	670





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# EDITORIAL

## THE PRINCE OF WALES.

Racey, the clever cartoonist of the "Montreal Star" expressed a happy symbolism when he recently portrayed Canada as a smiling maid disclosing the treasures of our Dominion to our visiting Prince.

Youth will be served, and youth has a spontaneous companionship with youth that is denied to those of maturer years. The youth of Canada has been to the wars, young maidens as well as young men, and the Prince was there too. In this fact lies a bond that ensures the Prince a royal progress throughout Canada, such as the Dominion has never seen before.

The Prince of Wales comes to us smiling and debonaire, speaking both the tongues of our country, at the victorious conclusion of a bitter war in which Canada did what her people conceived to be their duty, and from which the Canadian people has emerged a nation acknowledged as valorous and as one of the League of Nations.

Surely the signs are propitious that bring this young Prince at this time to a people that has been stirred to its depths by the wounds it has suffered in a war in which it voluntarily assumed unprecedented responsibilities and burdens, and which, without boasting, it knows it materially assisted to win.

The ideal for which our young men died is symbolized in the Prince of Wales, as he also symbolizes for the bereaved parents of Canada the youth they mourn, and all this, the summation of five years of tense national living, when added to the undisguised and boyish pleasure shown by the Prince at the lively reception given him in his progress, is part of that amazing community of interest and ideal, that intangible, sometimes seemingly incongruous and contradictory spirit that binds together the commonwealth of the British peoples.

## HOISTING MEN IN B.C. MINES—NEW SAFEGUARDS.

As a result of the lessons learnt from the investigation of the causes of the accident at Nanaimo by which sixteen men were killed through the breaking of a hoisting rope, the Coal Mines Regulation Act of British Columbia has been amended by the insertion of new clauses requiring that all cage chains in general use shall be annealed once in every six months, and that detaching hooks shall be cleaned and re-fitted once in every three months. It is also required that every winding-rope shall be given a bath in hot oil before being put on, and that every winding-rope shall be recapped at intervals not exceeding six months. It is also

provided that no winding rope which has been in use for more than two years, or which has been spliced, shall be used for raising and lowering persons.

These are all very necessary, and rather elementary precautions, and if they are strictly enforced the risk connected with hoisting men in mine shafts should be much lessened.

Examination of the thimble or ring through which the hoisting rope passes immediately after leaving the pulley is also necessary. There is a case on record in Nova Scotia where the detaching hook failed to hold the cage because the ring had been worn too wide by the constant friction of the hoisting rope.

Hoisting ropes, and indeed wire ropes of all kinds used in mining, are too often neglected. Haulage pulleys are not replaced when broken, and are often found so worn or misplaced as not to revolve. The haulage rope drags on the wet ground, often in acid water, and altogether wire ropes are more often misused than used. Ropes supplied by good makers are manufactured with sufficient internal lubrication to last for a reasonable time in use, but no manufacturer can overcome the results of later neglect to lubricate, or of mis-use. Above all, no rope should be used too long. Ropes that are too weakened or too old for one situation often do very well in lighter work, but most accidents in connection with ropes occur from too prolonged use.

## MINING COURSES FOR WORKING MINERS.

The August Bulletin of the American Institute of Mining & Metallurgical Engineers contain an announcement with regard to the commencement of a "Co-operative Department of Mining Engineering" in the Division of Science and Engineering of the Carnegie Institute of Technology, the especial interest of which lies in the attempt that is to be made to afford an opportunity for higher technical education to men who have, as the "Bulletin" phrases it, "made good" as practical coal miners.

This is the great lack of technical education as applied to coal-mining, or indeed any kind of mining, in Canada. There exists abundant opportunity for the young men who can attend university classes as a day student for a number of years, but there is a great hiatus between these institutions of learning and the "man at the face."

In a Bulletin dealing with the coal mines of Nova Scotia, written four years ago, the Editor pointed out that in Nova Scotia the provincial government had provided a Technical College at Halifax where mining and general engineering courses could be taken, and



that there were five other colleges in Nova Scotia at which engineering courses could be taken, yet, with all this provision of educational institutions, not one of them has the financial resources to equip really adequate laboratories for research work, nor are any of these colleges sufficiently near to the mining districts to allow the use of their laboratories and scientific equipment by students who work during the day and attend schools in the evenings.

It was suggested that it might be found possible by a system of scholarships awarded on the excellence of work done in the evening mining schools, to select promising students for short mining courses in Halifax, and "thereby remove the financial limitation that prevents many young miners from taking advantage of the Halifax Technical College."

This difficulty is still a very real one. One of the most promising attempts to remedy it, is the Haileybury Mining School, which, fortunately it has been found possible to place within tram-distance of the mining activities of Cobalt.

The wealth invested in Canada's coal mines, and the number of persons employed therein, is of course very small compared with the phenomenal status of the United States coal industry, and we have not such wealthy foundations as the Carnegie Institute to help our educational authorities, but unless some feasible bridge is provided by which the son of the miner, and the son of the minor colliery official, can obtain a more adequate education in the science of mining, these men will continue to suffer under a heavy disability. This does not mean that many Canadians have not been able to forge their way to positions of responsibility and eminence in the mining profession minus the aid that a university education would have given them, but they have done so despite their lack of opportunities, and many deserving men have just failed to grasp that higher status in their profession that a little more technical education would have given them. They have seen the son of the stranger take the positions they themselves should have filled, but for this small yet fatal lack.

One of the problems of the large mining companies is to find suitable men for official positions. One often hears the complaint that our young men are not what they used to be, but a little thought will show the unfairness of such a complaint. The truth is that in some of the provinces of Canada we have not only failed to keep step in the educational march, but we have slipped back.

Technical education in coal-mining should not consist of sufficient knowledge of formulae and text-book lore to pass an examination for a certificate of competency in an official position. There is nothing of less real value as the test of a man's fitness for official positions than the average examination, which is a test not of knowledge, but of memory.

There should be some means provided by which stu-

dents, already working in the mine, should be selected and given the opportunity to take such a course of technical training as will occupy from six months to two years. Until this bridge is built, the mining industry can never draw fully upon that reservoir of material composed of the working mining population itself, which if heredity and native skill goes for anything, should provide the very best kind of officials. We are daily wasting our national man-power when we leave untapped this great body of hereditary occupational skill. Indeed, such a course is worse than waste, because the brains that might under proper training have served to build up the mining industry, may, because of thwarted opportunities and lack of outlet for intellectual energies, turn around and pull it down, as they have done elsewhere.

#### *RUIN AND RESTITUTION IN FRANCE.*

We reproduce in the current issue of the "Journal" a description by Dr. Frank H. Probert, a first-hand and competent witness, of the far-reaching economic destruction carried out by the Germans while in France, and particularly just before they were driven out by force of arms.

Thanks to the courtesy of the Editor of the "Mining & Scientific Press," from which excellent periodical Dr. Probert's article is copied, the "Journal" is able to include a series of original photographs taken by Dr. Probert, which are of a nature to make comment superfluous.

#### *"WILD CATS."*

It is pleasing to learn that the Ontario Government contemplates following up its recent prosecution of doubtful oil promotions by devoting some attention to the more than dubious mining stocks that are being so freely advertised at this time.

Reports of a revival of mining activity from every part of Canada are reaching this "Journal," and in British Columbia as well as in Ontario the quickening of interest in mines is being accompanied by the unwarranted booming of unproven mining ventures. Some remarkable phrases are being used to dazzle and attract the moths to the candle. One advertisement referred to cross-cutting "in the sheared zone of third enrichment" which sounds like something, but really means nothing.

Other advertisements emphasize the proximity of prospects which are being promoted to proved mines, which also implies nothing. Again, one reads of surface veins which are expected to join at depth, and when so joined are expected to contain high values.

Some extremely reputable newspapers are opening their advertising columns to this kind of bunkum information that is intended to deceive, properly characterized by the Attorney-General of Ontario as being vague, illusive, and mainly "glittering generalities of the 'get-rich-quick' variety."



# The Geology of Ontario as it Affects Gas and Oil Production

By DR. M. Y. WILLIAMS, D.G.S., Ottawa, Ont.  
Presented at the Organization Meeting of the Natural  
Gas and Petroleum Association of Canada,  
London, Ont., June 18th, 1919.

Both gas and oil are rock products and controlled in their occurrence by geological conditions. It is, consequently, the work of geologists to seek out and interpret the controlling conditions.

Investigations follow two main channels: first, the study of rock outcrops; and second, the study of well samples and well records. Without the study of exposed rocks we could not determine the age or many of the characters of the rock formations, and without the drillers' records, we would, for the most part, be in the dark as to the conditions of oil occurrence.

For gas or oil accumulation the necessary conditions are: the presence of oil or gas in the formation being tested; porous rock which may contain oil or gas; an impervious cover rock, or in some cases an impervious basal formation; and last but not least, suitable rock structure to cause oil or gas accumulation.

In general, oil and gas occur together, in varying relative proportions, and are accompanied by salt water. Because of the greater specific gravity of salt water, the oil and gas are caused to accumulate in anticlines and domes, at abrupt changes in rock dip, or in the upper parts of lenses of porous rock. Where no water is present with the oil and gas, or where the formation is only partially filled with these fluids there is a tendency for pools to form in synclines or basin structures above an impervious floor rock.

In Ontario five formations have produced gas and oil and a sixth is reported to have produced gas. Starting with the highest formation and going downward, these are, the Corniferous, the Salina, the Guelph, the Clinton, the Medina and the Trenton.

The Corniferous (also known as the lower or big lime and by geologists divided into an upper division called the Delaware limestone, and a lower division called the Onondaga limestone) formation is the producer of oil at Petrolia, Bothwell, Oil Springs, Mosa and other smaller fields. The Salina is reported to be the gas-bearing formation of the Kent field and one of the oil-bearing formations of the Tilbury Field.

The Guelph formation produced oil in the Leamington Fletcher, and Wheatley fields, and gas in Gosfield, Mersea, Wheatley, Tilbury, Oil Springs and Shetland.

The Clinton produces gas in the Onondaga, Caledonia, and Cayuga fields and at Port Colborne west of the canal.

The Medina sandstone is the main gas producing formation of the Niagara Peninsula, near Brantford, in the Port Dover and Delhi fields and elsewhere, and produces some oil in Onondaga township near Brantford.

The Trenton formation has produced small quantities of oil on Manitoulin Island, at Milton, and near Kingsville. It is now attracting merited attention because of its commercial production of both oil and gas in Dover West township.

The important problem for us all is the future production of oil and gas. We will consider this by formations.

The Corniferous formation has been, obviously most explored, 1st because it occurs at shallow depth, and

2nd because it is penetrated in the drilling of deeper holes. The oil occurrence corresponds closely to the rock structure and new fields are best explored after careful structural work has been done such as that carried through to such splendid success by F. J. Carman and John McLeod in Mosa Township. Portions of Eastern Lambton county, Western Middlesex county and a few selected areas in Elgin and Kent and possibly Essex counties are still insufficiently explored.

I can say little of the future of the Salina formation as at present it is not clearly differentiated from the Guelph.

The Guelph formation lying west of a line drawn from Southampton past Kitchener to Paris, and north of a line from Paris to Windsor can scarcely be said to be explored outside of a few localities, such as Oil Springs. The structure in the Guelph is not easy to determine as where salt lenses occur in the overlying Salina formation the Guelph is not parallel the higher formations. There are no horizons in the Guelph which can be readily recognized from place to place, and hence the structure is not readily worked out, even where numerous records are available.

The Clinton and Medina formations have been carefully explored, and the gas companies are well prepared to explore any untested areas.

The Trenton is perhaps the most alluring and at the same time the most illusive of the oil and gas bearing formations of Ontario.

On Manitoulin island where it has been drilled at several places, the formation varies in depth from surface outcrops to about six or seven hundred feet from the surface. Oil has been struck in a number of wells, but the supply did not last. However, the wells were drilled too near the outcrops to test the field properly and no attempt was made to work out rock structure.

The recent careful and systematic work carried on by the Union Natural Gas Company in Dover West Township has been crowned with success, and a commercial production of oil and gas is being obtained from the Trenton at a depth of 3,000 to 3,500 ft. We learn from this drilling, however, that pockety, porous rock seems to control the accumulation of oil and gas, which here occurs in a syncline. Only a small quantity of salt water is present. If any general theory can be deduced from a study of the Dover field it is that low, rather than high structure is favorable for oil in the Trenton formation.

Besides the south half of Manitoulin island, large areas of land underlain by untested Trenton lie between Lakes Huron, Erie and Ontario, and a line drawn from Collingwood to Port Hope.

One other area of possible value for oil and gas is to be found to the west and south of Hudson Bay. Here the Corniferous and the Trenton formations have been found, and it is probable that the Guelph also occurs there. It is my plan to start for Moose Factory on James Bay the 1st of August to study conditions affecting oil or gas occurrence.



## Ruin and Restitution In France

By Frank H. Probert.

It is almost five years to a day since the fostered dreams of world domination by Germany assumed tangible expression by challenging the balance of power. The dream is dissipated, right has conquered might, but at what cost! During the seemingly endless days of struggle the Allies looked to the United States for moral, financial, and material support, and finally for the man-power that gave strength to the knock-out blow. The peace treaty was signed after much discussion, deliberation, and delay, in the same room at Versailles as witnessed the preliminary parleys for the exacting treaty imposed by Germany on the French, concerning the price to be paid for the Franco-Prussian war, but has the world caught the reflection from the Hall of Mirrors of the ruins of northern France, or the image of crimes unthinkable? This is not the time to arouse or excite hatred of the Hun, but 'lest we forget' that the wounds of France still gape and that crippled industry will have to struggle for many years, a few close-up views are worth contemplating.

In 1918 M. de Billy,\* as head of the French High Commission visiting Washington, invited Secretary Lane of the Interior Department to send a commission to France to study the condition of the coal and iron mines and discuss with French engineers plans for the future. At that time many properties had been destroyed by shell-fire—a destruction inevitable in waging such a war—but since June 1918 ruin of another kind has been wrought and wrongs done that cannot be excused, explained, or exculpated. In January of this year I visited the Western Front as a member of the American Mining Mission, my associates being Dr. F. G. Cottrell, and Mr. George S. Rice, of the U. S. Bureau of Mines. Every facility and courtesy was extended to us by both the French and United States governments to carry out the investigation, and in three months we motored nearly 2000 miles through the Pas de Calais and Nord districts of the Valenciennes coal-fields, the iron-ore districts of Luxemburg, Lorraine, and Lorraine Annexée, and the coal areas of the Saar Valley. My remarks are not based on hear-say information; my convictions come from close personal contact with the conditions as they exist to-day, and the accompanying views were portrayed by my camera. Documentary evidence is available to show that it was the intention of Germany to destroy the mines of France and so render her commercially impotent; field evidence shows that their plans were executed systematically, scientifically, and almost successfully.

In order to understand the German strategy of the Western Front it is necessary to look back fifty years. At that time Germany had great coal mines in Westphalia and the Saar province, and but limited iron ore resources. The possibilities of Eastern Lorraine were being proved and by the Treaty of Frankfurt, signed on May 10, 1871, France ceded to her conquerors all the outcrop mines of the vast iron-field. The boundary was drawn with meticulous care, guided by engineers and geologists, to include all the land known

to be commercially mineralized, but when Thomas and Gilchrist, two English metallurgists, developed the basic Bessmer process to treat high phosphorus ores, the French explored the lands to the west of Lorraine Annexée, with the result that in 1913 the known reserves of the great Briey basin were owned by the Germans and French in the ratio of 2,330,000,000 to nearly 3,000,000,000 tons respectively.

Immediately following the close of the Franco-Prussian war the Germans developed their steel industry with great rapidity, and just before the outbreak of the recent war they produced 21 million tons of iron ore from Lorraine Annexée and purchased 9 million tons from French Lorraine, from which they made 19 million tons of pig-iron annually. Of the iron ore smelted in German furnaces 58% came from Lorraine Annexée, and with the return of this land to France, the domestic supply will be less than 20% of the capacity of the plants. France received German coke in return for iron ore. In normal times France is compelled to import coal to meet her domestic and industrial needs. In 1913, 43 million tons of coal was mined from the Valenciennes field and 20 million tons imported. Here then was the situation; an iron ore supply coveted by Germany coextensive with Lorraine Annexée, and practically all the coal mines lying immediately south of the Belgian border. The German hordes swept down into France and for over four years the titanic struggle was fought out on the fringe of the mineralized area. Two-thirds of the iron reserves were in the hands of the enemy during the War. It was in order to strengthen the hold on this important asset that the St. Mihiel salient was formed and Verdun attacked in 1916, while the bitterest of battles were ceaselessly waged for possession of Lens, the centre of the coal-field. Both iron and coal mines were worked by the Germans during their occupancy, worked as intensively as their diminishing virile man-power would permit; captive labor was forced to assist, and compelled under threat of death to participate in the wilful destruction, as soon as the inevitable result of the war was realized. The steel works of Lorraine, metallurgical plants planned and equipped with every modern device for efficient operation, were quickly modified to turn out weapons of war during the first year of the conflict, after which, as I shall show, they were dismantled piecemeal; the desirable equipment being transported across the Rhine, the rest destroyed with a deviltry difficult to comprehend. At the south end of the district the steel plants at Pont-a-Mousson were damaged by shell-fire; this town was never occupied by the Germans, but from Briey northward to the Luxemburg line, the wonderful works have been sacked and wrecked beyond recognition. Coal and iron are complementary minerals, the two *grands seigneurs* of the mineral world. From them are fabricated the weapons of war as also the plowshare of peace; with them a nation is strong financially, commercially, and industrially, always, of course, assuming the legitimacy of motive prompting production. Bismarck characterized the former war as one of "blood and iron." the iron of Lorraine was the price of peace, and the industrial association of Berlin and Dusseldorf in 1917 declared to Hertling and Hindenburg that "the annexation of

\* We regret deeply to record the fact that Colonel Edouard de Billy was thrown from his horse and killed on June 12 in France.—Editor, M. & S. Press.



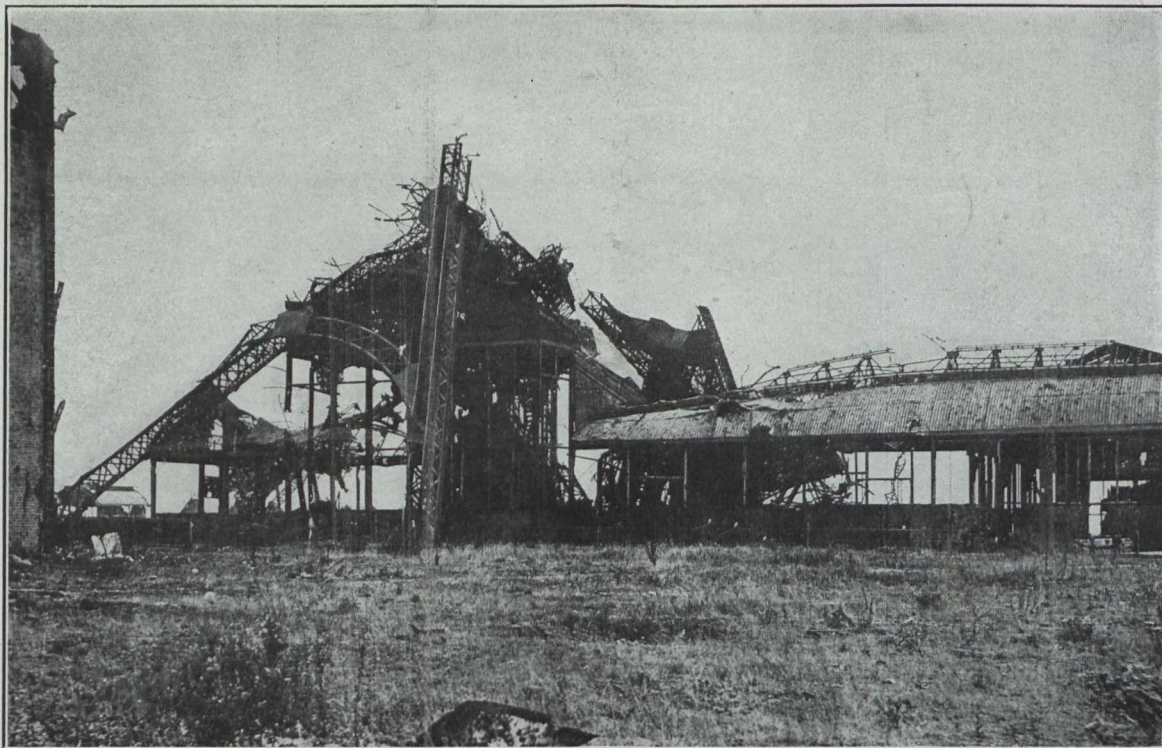


Lens, in April, 1919.



Shaft No. 4 at Courriere, in the Pas de Calais.





Shaft No. 11, at Bethune.



Surface Plant at the No. 4 Shaft, at Courriere.



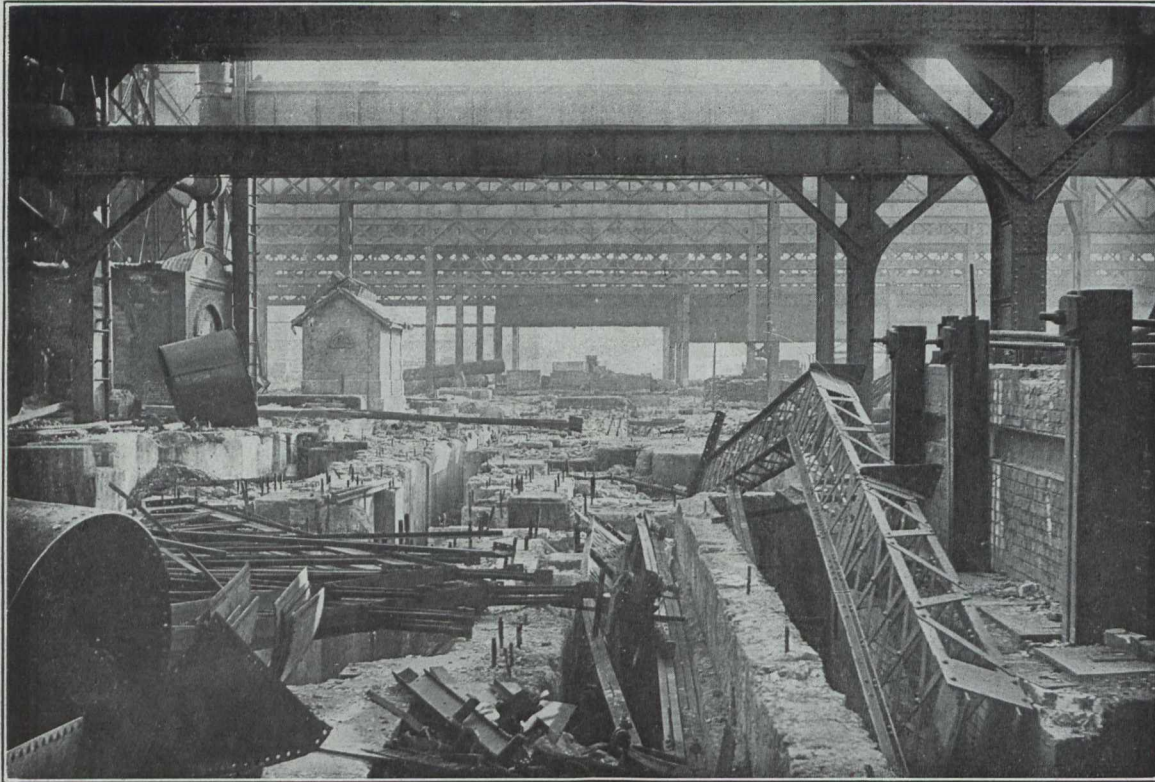


Steel Plant at Longwy.



Rolling-Mill of the Longwy Steel-Plant.





Steel Works at Mont St. Martin.



Shaft and Plant at Bethune.



the Briey and Longwy basin is indispensable because the possession of this region is of incalculable value to Germany for economic, industrial, and agricultural reasons, in view of a future war."

In 1913 the 29 iron mines of the invaded section of the Briey and Longwy basins gave employment to 15,200 men and produced 17½ million tons of ore. During the four years following August 1914 the Germans worked the mines intermittently, the shipped all of the ore on the stock-piles to the steel works, and mined at the rate of 30% normal output. The underground workings were not seriously damaged at any of the properties, although many of the surface plants, particularly the miners' dwellings, were razed. The damage is more indirect and the visiting engineer notes that the ore was removed from the most convenient workings; pillars have been robbed near the main galleries, thus threatening the arteries of underground transportation; the extraction of ore without proportionate advance of development headings will postpone the pre-war scale of output for some time; the machinery has been abused for want of lubricants and every ounce of copper, the trolley-wires, motors, brass fittings, as well as all rubber, have been removed. The truth of the story that thunderous applause followed the statement of the Chancellor in the Reichstag denying the shortage of copper was drowned by the noise of the tinsmiths removing the copper-sheeting from the roof of the buildings, is emphasized wherever one goes in the invaded territory.

Unquestionable large sections of the developed areas underground will be permanently abandoned because of the improper mining done by the robbers. At St. Pierremont I was impressed by the extraordinary regard for the welfare of the workmen; hundreds of cases of mineral water were stored at the shaft-station on one of the levels for the Germans to drink, fearing the valiant had copied the vicious and contaminated the water supply!

Iron ore is of no value unless it can be beneficiated. What has happened to the steel plants? Visit Micheville, go to Longwy, ponders the ruins at Mont St. Martin; never a shell was fired here, but the destruction is complete. At the first mentioned plant, M. Nahan, the veteran manager, bowed with the weight of years and tormented by the nightmare of recent events, tells of the conscription of 2000 of his Italian workmen to destroy the model plant. German officers dwelt in his house while he was kept prisoner, presentation bronzes were confiscated for the few pounds of copper they contained, and the plant itself, what of it? All machines that could be moved were shipped to Fatherland, the rest destroyed; it is a mass of fallen stone and twisted steel, a scrap-heap impossible to describe. At the Aciéries de Longwy, the largest steel works in France and employing 7000 men before the War, the ground must be cleared clean that a new mill may memorialize the irrepressible spirit of France. Here one sees train-loads of high-grade steel cut up into movable pieces that were to have been sent to Holland to be turned into shell; the crankshafts, rollers from the mills, and cylinder-heads were cut with the oxy-acetylene torch or broken by liquid-air cartridges (high nitro-glycerine explosives were getting short toward the end), the boilers were blasted, and the structural steel of the buildings cut at the base, to be overturned. M. Dreux, the managing director of the company, showed me two antique brass

candle-sticks on the mantel of his living-room labeled by the marauders and spared to posterity because they were considered 'works of art.' Surely such magnanimity entitled Germany to mercy at the peace-table!

The Pas de Calais and Nord coal mines have suffered even more than the iron and steel plants. The damaged area embraces 24 of the 27 concessions; the Gruay mines were not forced to shut-down although damaged by long-range shell-fire and aerial bombs; eight concessions suffered from artillery bombardment and were later pillaged, while toward the eastern end of the district sabotage finds its most glaring expression. Twelve concessions had the surface plants of the many mines completely destroyed wilfully and systematically during the final retreat of the defeated Germans, even as late as October 28, 1918. The coal measures are overlain by water-bearing strata and quicksands, so that the shafts were sunk by special boring methods and lined with steel cuvellage; this was blasted with dynamite and the mines flooded. Of the 286 shafts 70 were dynamited, 172 are now filled with water, and 235 of the surface plants, magnificent steel structures built with the idea of permanency of operation, are partly, more often totally, destroyed. The few that escaped show the nature of the crime committed, for every building, every head-frame, bears a label giving the estimated quantity of high explosive necessary to wreck it. Many of the steel supports were cut by the oxygen flame and tumbled over into the already flooded shaft. The accompany photographs tells the story better than words. Lens, the centre of the coal-field, is completely destroyed and presents one of the dreariest spectacles imaginable. Near Lens the little river of Souchez was turned into the mines and for part of its course has disappeared, now flowing through the underground workings. Between Gruay and Valenciennes there is widespread, deliberate, and malicious destruction. Bethune, Lens, Courriere, La Basse, Douai, and other coal-mining centres, are crushed and crumbling ruins.

The problems of reconstruction, reparation, and rehabilitation are many. They are faced with a fortitude, courage, and determination equal to the gigantic task, and they will be solved. France has lost during the War 75 per cent of her peace-time industries, the debts now aggregate three-fifths the total wealth of the country, her young man-power is sadly depleted and greatly exhausted, during the War the deaths exceeded the births by 800,000, but, while materially impoverished, France is morally strengthened, and moral energy is as important as material resource. Full restitution for the wrongs done is impossible except in so far as the allied powers combine to permanently wreck the national industry of Prussia — which was to wage war.

The peace treaty of June 28, 1919, gives to France Alsace-Lorraine, 5,600 square miles, the frontiers to be as before 1871. In part compensation for the destruction of the coal mines, and as reparation, Germany cedes full ownership of the coal mines of the Saar Valley with their subsidiaries, accessories, and facilities. This is but a sop, for if France will beneficiate the additional iron ores of Lorraine she must purchase proportionately larger quantities of coal. The coal situation was menacing before the War; it is now aggravated. In 1913 it was necessary to import 20 million tons, and this when the Valenciennes field was giving its normal output. The whole product of the Saar mines



in actual tonnage, saying nothing of the inferior quality of the coal, is not sufficient to offset the lack of coal from Northern France.

The Saar produces four grades of coal none having the calorific value of the coals of northern France or of Westphalia. They can be used most advantageously for steam and domestic purposes but they are not good coking coals, one ton yielding little more than half a ton of coke, which is friable and of very inferior quality metallurgically. The Saar coal is sometimes referred to erroneously as the economic complement of Lorraine iron. Under German control the iron ores of Lorraine, the coal of the Saar and Westphalia; and the steel plants of all three districts, were treated more or less as a unit industry and most effective exchanges were made by means of the available cheap transportation. It is of vital importance to France that this exchange be maintained under intelligent government control; if coal from Westphalia is withheld the steel industry cannot expand, and either many of the iron mines will remain idle or a great surplus must be exported.

It would be presumption on the part of an American mining engineer to suggest improvements in methods or practice in French mining. The French engineers have long known their own problems and have solved them in accordance with their system of finance. Their mines are developed and equipped with the idea of permanent industry, and unless there is serious labor unrest and extraordinary advances in wage scale, the old French practice is peculiarly suited to French conditions. Their policy is progressive and there is constant search for new mineral areas or extensions of proved deposits. French Lorraine has greater reserves of iron ore than Lorraine Annexe and just before the outbreak of the War drill-holes had shown the extension of the coal measures of the Pas de Calais southward. Iron and coal are complementary minerals. France will have them both in larger quantity than in 1914, and when her reconstruction program is carried out, the steel industry will be among the first assets of a land that has suffered greatly.—Mining and Scientific Press.

#### PROSECUTION FOR BREACH OF ONTARIO MINE LAW GOVERNING MAN CAGES.

The White Reserve Mining Company, Limited, were fined \$100 and costs by Police Magistrate S. Atkinson at Haileybury, on August 4th, 1919, for permitting men to be hoisted on a cage whose sides were not enclosed and which was not equipped with doors as required by the Mining Act of Ontario.

#### NIPISSING DECLARES DIVIDEND.

At a meeting of directors held in Toronto on Aug. 29 the usual quarterly dividend of 5 per cent was declared. The financial statement showed a substantial cash surplus on hand, in spite of the fact that production was discontinued five weeks ago by the striking of the miners. Surplus assets on Aug. 23, in cash, war bonds, ore and bullion totalled \$3,863,386.

Japanese coal output in 1918 was 27,500,000 tons, compared with 21,083,000 tons in 1913, and consumption in 1918 was 25,980,000 tons, an increase of 7,925,000 tons over 1913.

## Special Correspondence

### NORTHERN ONTARIO.

#### The Gold Mines.

Reports from the Porcupine field continue favorable. The gold production having reached a point that exceeds any previous record in Ontario's history, and increasing in volume, the outlook for this most northerly of the mining camps of the province is bright. Labor strikes in Cobalt and in Kirkland Lake have released not far under three thousand men a large number of whom are finding their way to Porcupine. Interesting reports continue to come from Northern Manitoba in connection with the new gold find. A fair sized rush of prospectors is taking place and, within the next week or two, more or less detailed information should be available. A number of prospectors from this district are on the scene of the discovery.

With the Hollinger Consolidated Gold Mines now producing gold at the rate of around \$7,000,000 annually; the Dome producing at the rate of around \$2,000,000 annually, and the McIntyre producing at a rate about on a par with the Dome, it is evident that the combined output of these three gold mines is at a greater rate than ever before established by all the gold producing mines in the province of Ontario.

Official figures confirm the above estimates in so far as they apply to the Hollinger and the McIntyre. In regard to the Dome, while the figures given may be actually about the present rate of output, yet shareholders would perhaps do well not to look upon this as being maintained without variation. It will be remembered that according to official advice presented not long ago in these columns that the directors of the Dome are willing to issue monthly statements just as soon as uniform production is achieved, but that to issue such statements under the present circumstances might lead to erroneous analysis being made.

One fact is made quite clear, however, and that is that gold mining is once more on a fair way to become a profitable business. With the three leading mines rising above the adverse influences, it is considered probable that the medium-sized gold mines will soon follow suit, and that during the coming year all will again be well.

The limited amount of information coming through in connection with the new gold discovery in Northern Manitoba is such as would arouse the interest of prospectors in general. It is stated that the pay-streak in the vein discovered, is about four inches in width and is very rich. What has not yet been definitely learned here is as to whether or not the vein outside of the pay-streak contains commercial gold values.

As is well known in gold mining, narrow pay-streaks are usually found to be erratic and cannot be depended upon as a source of steady output. On the other hand, provided the main body of the vein carries commercial values, the pay-streak even though narrow would serve to greatly increase the average value of the whole. The general impression appears to be that an important find has been made, and the early future will be looked to to justify or refute this impression. In the meantime a fair sized rush of prospectors is taking place.



**Cobalt.—General Situation.**

The later situation at Cobalt remains unchanged, except for the fact that more men are leaving the camp for the purpose of finding employment elsewhere. The mining companies show no inclination to change their attitude in so far as the Cobalt Miners' Union is concerned. Through the Returned Soldiers they have offered all workers of Cobalt re-instatement to their former positions and as stated last week have agreed to a system of collective bargaining that would give representation to every worker in the camp through one Central Council, and beyond that they refuse to budge. In a word the only obstacle to a resumption of work and an open discussion of all questions pertaining to labor is the recognition of the Cobalt Miners' Union which the companies declare is but the Western Federation of Miners under a changed name, the latter of which they will not recognize. In the meantime the quotations for silver continue to rise, being quoted recently at \$1.15¼ an ounce in New York.

During the month of July, from July 1st to noon of July 23rd, the Kerr Lake mine produced 196,637 ounces of silver valued at over \$200,000. This compares with an output of 105,402 ounces for the whole of June.

The McKinley-Darragh has declared its regular quarterly dividend of three per cent, payable October 1st. The disbursement will amount to \$67,428, and will be the fourth dividend paid this year.

The McKinley-Darragh went on a dividend paying basis in 1907 during which year a two per cent disbursement was made. Up to the end of 1918 a total of 241 per cent or \$5,349,595 had been paid. Added to this is the 1919 disbursements, amounting to 12 per cent or \$268,712, including that declared for October first, thus making a grand total of 253 per cent or \$5,618,307.

The McKinley-Darragh Company is in the happy position of having earned almost a full year's dividend requirements during the first seven months of the year, and a strike, even though it should last for several months might not seriously impair the financial position of the company.

As a result of no general effort to induce the Ontario government to make arrangements for throwing the Gillies Limit open for prospecting this year, it is feared nothing will be done.

The New Liskeard Branch of the G. W. V. A. took up the question at a meeting not long ago, at which it was decided to submit the following letter to the Hon. G. Howard Ferguson, Minister of Lands, Forests and Mines:—

"This branch of the G. W. V. A. considers the time has now arrived for the opening of the Gillies Limit for prospecting, and that the said Limit should be opened up this fall, Returned Soldiers to have one month's preference to stake claims thereon before others are allowed to stake on said Limits."

(Signed), J. M. Baird.

Sec.-Treas.

Concerning this, not a few returned men have been looking quietly into the possibilities of the Limit, and have volunteered the opinion to the writer that they are confident the Limit would develop in a promising way if opened this fall, thus permitting prospectors to

do a limited amount of surface stripping before winter sets in, to be followed by sinking test pits during the winter.

Similar views have been expressed by others, but as yet no statement has been forthcoming that would indicate that the government has lent a sympathetic ear to the proposal. However, it is perhaps not yet too late to press the request, which, if granted, might reasonably result in considerable activity in the more promising parts of the Limit.

**Kirkland Lake.—Workmen the Only Sufferers From Strike.**

In a number of instances, some of the leading mining companies in the Kirkland Lake gold area are laying plans for remaining idle for considerable time, in some instances until next spring.

The labor strike caught the camp just at a time when, with one exception, the mines were not paying any revenue to their shareholders. The Tough-Oakes had only been reopened after staggering for several years through litigation which had a direct bearing on retarding its development; the Burnside was being explored in a comprehensive way for the first time in its history and is to be merged with annex the Tough-Oakes, thus leaving it in a position similar to the latter; the Wright-Hargreaves had just completed arrangements to instal a big new mill to be completed before winter set in; the Kirkland Lake Gold Mines had just started to produce gold in a small way; the Teck-Hughes had succeeded in treating a tonnage sufficient to indicate that it was at last nearing a point where a fair margin of profit might be realized; while, the one paying mine, the Lake Shore, was working at full capacity and returning dividends at a moderate rate to its shareholders.

To those who are familiar with the situation, it is evident that a number of the mines were soon to begin returning revenue to their shareholders, in spite of the high wages being paid the employees and the abnormal cost of material and supplies. However, now that operations have been curtailed by a labor strike, the consensus of opinion appears to be that the mines as a whole will ultimately yield a larger amount of profit to their shareholders than had they been worked unremittingly during the present period of abnormal costs. With these facts in mind, it will perhaps not come as a very great surprise to learn that such mines as the Tough-Oakes should make arrangements to remain idle until next spring.

This fall should see the macadam road completed as far as the Wright-Hargreaves mine, and with the arrival of next spring the balance of the road as far east as the Tough-Oakes can be soon completed.

Therefore, the indications are that by early next summer the mines will all be in a position to operate at full blast, and probably not handicapped by economic conditions such as exist this year. Therefore, the labor strike appears destined to be responsible for the loss of one year, although perhaps ultimately advantageous to company shareholders. To the workers in the mines and mills it will probably represent a reduction in payroll of approximately one million dollars.

**Boston Creek—Government Surveying for Road.**

The government is making a survey from Boston Creek station on the T. & N. O. Ry. as far east as the centre of activity in the Skead township gold area according to information just to hand. Prospectors



have travelled most of the intervening territory and believe that they have located a suitable route, and government surveyors are stated to be making a preliminary survey.

According to available information, no serious obstacles are to be encountered and with the exception of building a bridge over the Blanche river, the road, it is believed, may be built at very reasonable cost.

With development work in Boston Creek proving highly satisfactory, and with an excellent prospective area extending all the way east to the east side of the township of Skead, a road some fifteen or sixteen miles in length would pass through a strip of territory which gives promise of containing commercial deposits of gold in various places for the entire distance.

#### Miller-Independence Mine.

The necessary contracts have been entered into between the Miller Independence and the Northern Ontario Light and Power Company in connection with the electric energy required to operate the new modern mining and milling plant which is being installed this fall at the Independence. A survey has been made, and the route chosen runs due east from Boston Creek, following a line a half a mile south of the north boundary of the township of Pacaud.

On Monday of this week a contract was let for the cutting of a right of way for the transmission line from the main line at Boston Creek to the mine. This work will be started immediately, and should be completed by the end of September. Cement for new foundations, as well as a large part of the building material is already on the ground.

A meeting of the directors of the company has been called for August 29th.

#### Examination of Lake Agotawekami Properties.

A recent revival of interest has taken place in the Agotawekami Lake district, situated in the north-western part of the Province of Quebec, a short distance south-east from Lake Abitibi and about twenty-five miles north-east from the Lightning River district.

According to reports just received from that district, Mr. Perry, representing the Timmins interests of the Hollinger Consolidated, has concluded an examination of some of the surface outcrops in that district and has been sufficiently encouraged to secure a large number of mining claims. It is understood the majority of these claims had been staked a couple of years ago following the small prospectors rush at that time, but that for the greater part the assessment duties were not complied with and the territory had been allowed to revert to the government.

The principal showing is said to occur on an island situated close to the mainland, and consists of a large body of gold-bearing quartz. Assays taken from the deposit at the time of the former rush, showed the deposit to be too low grade to be of commercial value. As to whether or not Mr. Perry's examination has met with better results, or that the low values are considered sufficiently encouraging to warrant a reasonable amount of exploration work, has not been made clear.

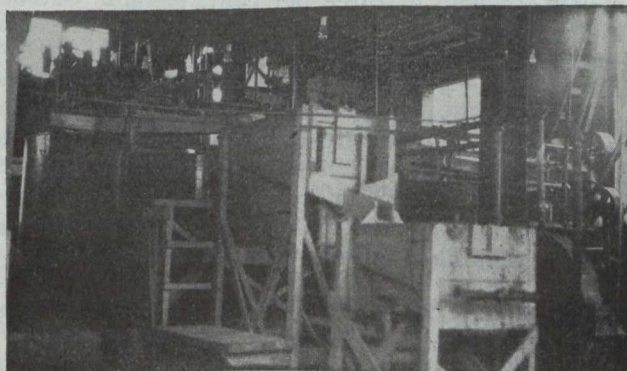
#### Industrial Growth in the North Country.

In that territory lying along the Ontario-Quebec boundary, beginning at the south end of Lake Temiskaming, and extending into the far north, destiny is shaping plans that will in time elevate this district to a position of world envy. Just as the great silver

deposits of Cobalt, and the gold deposits of Porcupine, Kirkland Lake and Boston Creek have laid the foundation for a beginning, so will the other natural resources in the form of additional mineral deposits, pulp timber, agriculture, water-powers, etc., constitute the basis for the great and lasting future expansion. The Abitibi pulp and paper mill is already one of the largest of its kind in the world. It is situated in Ontario, at Lake Abitibi, and has been established at an estimated cost of perhaps a dozen million dollars. The Quinze water-power, just above the head of Lake Temiskaming, and the development of which is even now under contemplation, is estimated to be sufficient from which to develop upwards of 100,000 h.p. Farther south, or just at the foot of Lake Temiskaming, the Kipawa Fibre Company is completing the first unit of a plant that is being constructed at a cost of about \$5,000,000. This first unit is expected to be in operation some time in October of this year.

One of the newer projects is that of big eastern interests who are understood to be making preliminary arrangements for harnessing the outlet of Kipawa Lake. It is estimated that this scheme is calculated to generate electric energy at a rate second only to Niagara on this continent.

In all parts of the world, it has been found that great centres of industry quickly spring up, following the advent of abundance of cheap power. It is believed that in Northern Ontario and in North-western Que-



Experimental Ore-Treating Plant—Haileybury Mining School.

bec this same condition will hold good. Accordingly, the contention appears to be well-founded that the boundary towns, particularly those situated along or close to the shores of Lake Temiskaming or the Ottawa River are destined to share great advantages accruing from rapid and extensive industrial growth along the northern reaches of the provincial boundary.

Further, that Ontario and Quebec are not going to grow and other provinces lag, is made evident in the detailed information coming from Manitoba, where work has already been started at Little Du Bonnet Falls with the object in view of developing some 160,000 h.p. at a cost of about \$9,000,000.

#### Soldiers' Courses at Haileybury Mining School.

A new Vocational Branch of the Soldiers' Civil Re-Establishment opened at Haileybury, is already a very busy place, over 50 applications for re-training being already applied for.

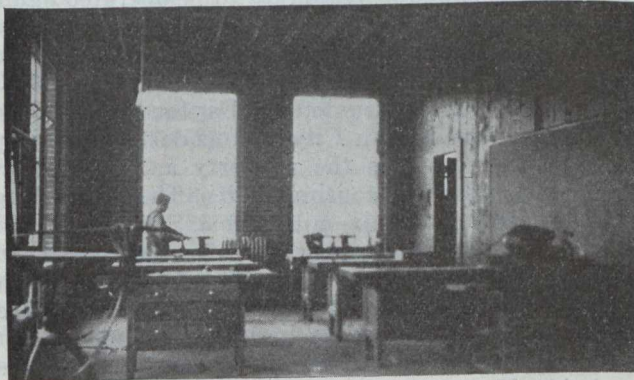
Any soldier disabled by the war and unable to continue his former work is entitled to retrain in some suitable occupation, and is allowed pay and allowances



amounting to from \$60 to \$110 per month for a period of six months training. Men who enlisted with the C. E. F., under the ages of 18 years, whether disabled or not, are allowed training in an industry, or a course at school or college, and are allowed a total of \$60 per month, in addition to any school or college fees, which are paid by the government.

Already a good many men are applying for courses in assaying and metallurgy at the Haileybury Mining School, and some applications for course in business and railroad telegraphy have been approved of.

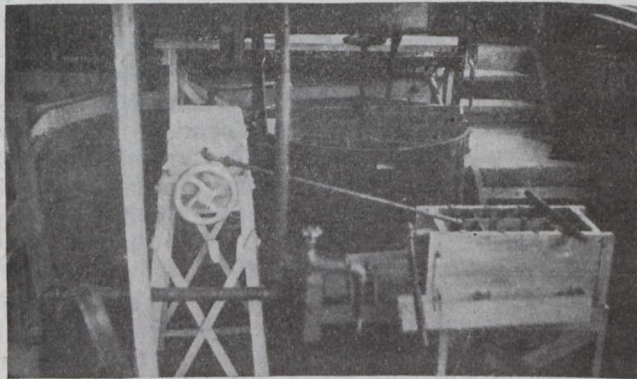
Major A. H. Smith, who was a resident of Northern Ontario before the war, is in charge of this new office and has lately been joined by Major S. M. Thorne, who will be in charge of placing men with the industries.



Workshop—Haileybury Mining School.

**Kirkland Porphyry Makes an Assignment.**

The Kirkland Porphyry Mining Company went into voluntary liquidation recently, when M. P. Vandervoort, solicitor for the company, made an assignment in its behalf to F. C. Clarkson. It was stated that the company has no creditors, and that there are very few shareholders. It is expected that a statement of its financial position will be issued next week. This company was prominent a couple of years ago, through a controversy, in which several mining men were engaged, having conflicting interests.



Experimental Ore-Treating Plant—Haileybury Mining School.

**New Power Company for Northern Ontario.**

A new company, capitalized at \$1,000,000, including 5,000 shares of 7 per cent cumulative preferred and 5,000 common shares, has been incorporated under the laws of the Dominion and will be known as the Wendigo Power Company, with head office in Guelph. The company's plant will be located some 20 miles south of Larder Lake. The purpose of this company is the development of hydro-electric power on Wendigo Lake and certain parts of the Blanche River.

**BRITISH COLUMBIA.**

**The Metal Mines.**

**Victoria.**

Some exceptionally fine samples of gold, silver, copper ore from the Premier Mines, Salmon Arm, were brought South for assay by Hon. William Sloan, Minister of Mines, on returning from a tour through the Salma Arm District, British Columbia. The returns, to say the least, are very interesting, being as follows:—

Gold . . . . .	\$512.06 per ton
Silver . . . . .	393.2 ounces per ton
Copper . . . . .	3.6 per cent

Figuring silver at \$1.10, and copper at 24 cents, the value of this ore per ton would be \$952.41.

Some tests of the Fleet Electrical Smelting furnace in the handling of British Columbia magnetite ores are taking place. The Provincial Government has supplied a quantity of ore from Texada Island property for this purpose. One test took place several days ago, being witnessed by the Provincial Mineralogist and other officials. While it was not as successful as might have been desired others it is understood are to be arranged.

Honourable William Sloan, Minister of Mines, has just returned after a trip through the Cariboo District. The object of his tour was to discuss with the miners and prospectors the question of dredging and placer licenses, to the end that the Government might ascertain what is necessary to encourage the opening up of that region. Mr. Sloan is of the opinion that large areas which have been held for many years without development, should be made productive. He found much interest manifested in gold mining throughout the district and believes that while the output recently has not been as large as in the past it will increase in the future. With the Pacific Great Eastern Railway, which now is being constructed through the Cariboo to Fort George, and eventually will tap the Great Peace River country, furnishing transportation facilities, operators will be able to place heavy mining machinery on their property. The Minister of Mines pointed to the fact that men with large experience at dredging operations in the Yukon are going into the Cariboo and investing heavily as being encouraging to the latter district. An instance was that of James Moore, one of the largest operators of the Yukon, who is placing a dredge on Antler Creek. His associates, wealthy Americans, have secured a large tract with promising placer grounds on the Swift and Little Swift Rivers, and preliminary investigations have so satisfied them that they have arranged to install a large dipper dredge. Mr. Sloan also spoke of the activity of the Dominion Government in conducting a geological and topographical survey covering sixteen square miles of that section. This work is centred at Harpers Camp where there is some very promising ground. At present the International Dredging Company has a machine operating with good results. At the junction of the North and South forks of Horsey River a drag line scraper is being put in by Victoria mining interests and the experiment is being watched with interest.

**Barkerville, B. C.**

The announcement that the Ward-Hopp litigation for possession of the Bullion placer mining property has been finally decided by the Privy Council in favor



of Mr. Ward, has been received with considerable interest in this District. The case has been before the courts for the past five years, during which time the property has been idle. And now that the Court of last resort has given judgment it is expected that the plant will be producing again in a short time. It is reputed to be the largest hydraulic proposition in the world.

#### Grand Forks, B. C.

The strike of the workmen employed in constructing a line of railway from Allenby to the Copper Mountain mine in the Canada Copper Corporation having been settled, good progress is being done. Nearly 150 men are working at Copper Mountain building ore bins and getting the mine in shape for producing as soon as the railway and mill are ready for operation.

Messrs. William Thomlison and S. A. Ritchie, the latter being an engineer in the employ of the Consolidated Mining and Smelting Company, recently inspected the Franklin Mining Camp. Mr. Thomlison expressed the opinion that there were a number of first class prospects there and that milling and concentrating plants should be provided by the operators for the treatment of their ore.

#### Nelson, B. C.

The McAllister mine on the north fork of Carpenter Creek, has been re-opened and Mr. R. A. Grimes, President and Manager of the Slocan Silver Mines, Limited, reports that a shoot of clean silver sulphide ore has been uncovered on the third level. It is over twelve inches wide at the floor and open fan-wise as it rises.

R. S. Lennie, of Vancouver, representing the Nugget Gold Mines Limited; N. T. Burdick Bros. and Brett, Limited, of Victoria and Vancouver; and R. H. Stewart, consulting engineer, have returned from a trip to Sheep Creek where they made an examination of development work in progress on the Nugget. Mr. Lennie has made the following statement:—

"Our visit was for the purpose of inspecting the development which was commenced last March on the combined Nugget and Motherlode properties which were associated by the amalgamation of last year. This consists of a tunnel starting in No. 5 Tunnel of the Motherlode at a point 900 or 1000 feet in. This new tunnel is now through the Motherlode ground and has entered the Nugget ground and has been driven in about 650 feet. It is going in at the rate of eight feet a day, which is about what was estimated at the commencement.

"We are much pleased with the showing made, the work being carried out as originally outlined by Mr. Stewart. We find the underground condition at the horizon on which we are driving similar to that on the upper levels and this confirms us in the belief that we will strike the veins at that depth in the same condition as on the levels above.

"In some instances we were delayed by tough quartzite but we appear to be through that now, and we see no reason why we should not strike the first of the three veins we are driving for about September 15th.

The party also inspected the long bore which A. W. McCune is driving on the opposite side of the creek through the base of the Yellowstone Mountain, to strike the Queen Mine vein in a new depth. This now is in over 1200 feet and the vein is expected to be uncovered in another 300 feet.

#### Slocan, B. C.

Foreclosure proceedings are to be taken immediately against the Lucky Jim Zinc Mines, Ltd., owners of the Lucky Jim Mine on Bear Lake, in the Slocan Dis-

trict, B. C. It is expected that re-organization will take place immediately to the end that the property may be again put on a producing basis. Senator Landrum McMeans, of Winnipeg, Man., trustee for the mortgagees is responsible for the foregoing statement. Under A. G. Larsen, who acted as trustee, the Lucky Jim produced \$200,000, paying off a first mortgage, lifting a floating debt, and making a start on the second mortgage of \$35,000. The present action is based on the latter indebtedness. Senator McMeans proposes on acquiring control to place his interest in the mortgage into a new Company in the formation of which the co-operation of former shareholders will be sought.

The Evening Star and Silver Nugget Mines, which have been dormant for years, are to be operated again. William Moore, owner of the California Mine, is supervising the work. Cars, rails and other mining supplies have been forwarded through Nelson, B. C. The Evening Star is situated on Dayton Creek about seven miles from Slocan City. Considerable development has been done on the property and plans have been decided upon for continuing it. The Silver Nugget is situated about six miles from Silverton. This also already has been opened up to the extent of driving two tunnels. A shipment of ore from the Evening Star two years ago ran 347 ounces of silver and \$23 in gold a ton while in 1894 a shipment from the Silver Nugget gave a return of \$208 a ton, silver then being 57 cents.

#### Lardeau, B. C.

The same evidence of revival in mining is found in the Lardeau District as elsewhere in the Kootenay and Boundary sections of this Province. The New Era Mining Co., of Vancouver, B. C. proposes placing the old Beatrice Mine, situated near Camborne, on the shipping list. This property was shut down some years ago because of the low price of silver. It is situated on the summit of Lexington Mountain, near the headwaters of Mohawk Creek. The Gold Bug-Rambler Mine is reported to be showing up well under development. A strike just announced is described as consisting of 25 feet of concentrating ore with 18 inches of clean ore on the wall running high in silver with 55 to 60 per cent. of lead and some grey copper. The property is on the south fork of Lardeau Creek, seven miles from Trout Lake City. Some fine samples of clean galena have been taken from the Tenderfoot Group on Tenderfoot Creek. There are three parallel veins on this property which have been developed by about 200 feet of tunnels, the greatest depth being about 50 feet.

#### Rossland, B. C.

Residents of Rossland are confident that the large concentrator which the Canadian Consolidated Mining and Smelting Company will provide for the treatment of the ores of Rossland Camp will be placed in that City rather than at Trail. Surveys now are in progress and investigation is underway as to the water supply. It is thought that no difficulty will be experienced in meeting the requirement in respect of the latter. In the meantime Rossland, once the busiest mining centre of the Province but recently suffering through the comparative inactivity of the mines in which the community chiefly depends, has taken on a new lease of life and is looking confidently to the future.

#### Kimberly, B. C.

A forest fire swept away most of the equipment of the North Star Mine, a well-known silver-lead prop-



erty which has been producing for some time. The tram line, some buildings, and necessary plant were destroyed. This is being re-placed as rapidly as the material can be secured and the mine will be shipping again in a few weeks.

#### Vancouver, B. C.

Monthly returns of the gold bullion received at the Dominion Government Assay Office Vancouver indicate that the output of British Columbia and the Yukon this year is not likely to greatly exceed that of the last twelvemonth, although an encouraging upward tendency in production is noted. A substantial increase is predicted in 1920 when new properties such as those being developed on Sheep Creek begin shipping, when placer ground which has been dormant during the war is made productive, and when the dredging companies, several of which are commencing operations in the Cariboo, are operating. The value of gold bullion received at the Vancouver office from British Columbia last year was \$2,178,078 and from the Yukon territory \$1,921,197. This, of course, does not represent all the gold produced by these sections of Canada.

A feature of the Vancouver Exhibition, which takes place next month, will be a mineral exhibit of British Columbia ores, which is being assembled by the British Columbia Chamber of Mines. The growing importance of the mining industry in the Canadian West is well illustrated by the increased attention it is receiving on such occasions. The Britannia and Granby Companies will display copper ores; the Surf Inlet Mine will show gold ores; the Drum Lummon Mine and other properties, gold and copper; the Heeley Mines, gold ores; the Bowena Mines, copper and the Consolidated Mining and Smelting Company of Canada will enter a large educational exhibit of minerals.

An organization known as the Vancouver Mining Development Syndicate has been launched with a capitalization of half a million dollars and \$100,000 capital subscribed. The object of this Syndicate is to bring mining prospects of British Columbia to the attention of the investing public. The idea is that in the event of a prospector locating a promising property which he lacks the means of opening up he can go to the Syndicate for assistance. The latter then will send competent engineer to report and, if the report is favorable, the prospector will be given financial aid. Should the proposition look as well on development as it originally promised it will be placed on the market, a proportion of what is realized to go to the discoverer and a share to the Syndicate. Messrs Nicol Thompson, A. M. Whiteside, J. H. Greer, A. H. Wallbridge, and A. Erskine Smith are members of the board of the new organization. They are businessmen of the City of Vancouver.

#### Trail, B. C.

S. G. Blaylock, who has been Assistant General Manager of the Canadian Consolidated Mining and Smelting Company for the past three years, has been made General Manager of the Company, vice J. J. Warren, who has become its president with favor in mining circles. He entered the Company's employ over twenty years ago, taking a minor position in the laboratory.

Ore receipt in gross tons for the week from August 7th to August 14 inclusive at the Trail Smelter of the

Canadian Consolidated Mining and Smelting Company aggregated 7,364 tons. The chief shippers were the Company's mines, the Centre Star of Rosstand contributing 1,857 tons and the Sullivan, of Kimberley, 578 tons of lead ore and 2,633 tons of zinc. The Mandy Mine, of the Pas, Manitoba, shipped 498 tons and the Quilp, of Republic Wn., 483 tons.

#### Salmon River, Portland Canal.

The Big Missouri Group of Claims, Salmon Arm, owned by Sir Donald Mann, is to be developed by means of the diamond drill, the plant necessary already having arrived at the property. The drilling contract has been awarded to Boyle Bros of Anyox, B. C.

#### Bayonne, B. C.

In the Bayonne District there is much development work underway and a number of promising properties have been from recently. On the Spokane Group the owners are building an Arrastra which their ore will be concentrated by this primitive stone mill. It is to be run by water power and will be completed in the course of a month. Two carloads of ore have been packed out from this prospect in the past two years. It is gold and silver-lead. Good showings also are reported to have been uncovered on the Echo Group and on Diamond Dick Hill.

George T. Jackson, General Manager of the Alaska Gastineau Mining Co.; James Freeburn, General Manager of the Chicago Mining Co., and George Oswell, General Manager of the Ebner Mining Co., have returned after a northern trip in the course of which they inspected properties in which they are interested.

### THE COLLIERIES.

#### O. B. U. Strike Ended. Renaissance of United Mine Workers.

The Fernie strike and the state of idleness which has been a condition throughout the U. M. W. of A. District 18 for almost three months is at an end. For several weeks the coal miners of the Crows Nest Pass, British Columbia, and of the coal mining centres of the Province of Alberta have been restless. It was freely predicted that a break would have to come very soon and come it did. The miners everywhere have declared themselves as loyal to the international labor organization and have discarded the One Big Union.

Mass meetings here at Fernie and later at Michel, which were addressed by Robert Irvine, of Seattle, organizer for the United Mine Workers of America, proved to be the turning point. Resolutions were unanimously passed in favor of the U. M. W. of A. and some days later the men went back to work, it being left to the International to work out a temporary agreement regarding wages that would be satisfactory. Of course the Local Unions now will be re-organized. These presumably will appoint delegates to represent the miners in negotiations with the Company and in the meantime no time will be lost in putting the mines on a productive basis.

The situation is much the same in Alberta. From Lethbridge comes the report that the miners of the Galt Mines voted on the 16th of August "to drop the O. B. U. and to sign up to return to work immediately as members of the U. M. W. of A." With Coalhurst and Drumheller Camps acting in the same way the dispute now may be considered to have been settled



and the fears of a coal famine in the prairie provinces next winter are set at rest.

On the latter point Senator Robertson, Minister of Labor in the Dominion Government, spoke at Calgary shortly before the settlement as follows:—

“You will get coal this winter. I believe that labor should have an equal voice in government and in industry with other interests but influences at work to overthrow industry, confiscate property and destroy government itself shall not succeed. We are backing the international unions which believe in the sanctity of contracts. The Government is satisfied, the United Mines Workers of America will fulfill what they pledge themselves to perform. We are prepared to see the labor forces built up through the international unions so as to make labor an asset and not a menace. I believe the eight-hour day is coming. Labor could be represented in parliament by some 15 members at the present time and it would be for the good of the country that they should be there. Now that the failure of the O. B. U. movement is in sight perhaps greater attention will be turned to the need for labor representation in the House of Commons.”

The Mine Operators throughout District 18 are gratified that the strike which has been maintained for so long and seriously threatened one of the most important of western industries has been concluded. They also are pleased that the One Big Union idea has been blasted, feeling confident that it will be possible to make terms with the men through the U. M. W. of A. that will be both agreeable to employer and employed and will be binding, thus rendering some stability to coal mining operations. In this connection a Calgary press dispatch announces that the One Big Union “is held to be illegal under the Criminal Code of Canada, which holds it to be an offence to support any movement which has for its object the overthrow of constituted authority.” This statement is attributed to Commissioner of Coal Operators Armstrong, who has been continued in office by the Dominion Government, and by the Operators.

#### Alberta—The Midland Coalfield of Canada.

At the Industrial Congress recently held at Calgary, Alberta an address was delivered by Dr. Dowling on the coal resources of the Province of Alberta. He said that in the country from the Grand Trunk Pacific to the Smoky River there is as much coal as in the whole of the Province of Nova Scotia. There was estimated to be 1,000,000,000 tons of anthracite which compares favorably with the Welsh product although not as hard as that of Pennsylvania. The area of Alberta's coal lands Dr. Dowling placed at 25,000 square miles which is in a belt 50 miles wide that runs along the foot-hills, sweeps out to the plains and back to the hills.

James White, deputy head of the Conservation Commission attacked the theory that hydro-electric power is cheaper than steam produced power. Improved types of turbines, combined with new methods of fully utilizing the steam producing qualities of coal rendered the future of hydro-electric power very insecure, especially as applied to the Province of Alberta. Mr. White asserted that, in his opinion, hydro-electric power is not the power of the future for Alberta, notwithstanding its apparent potentialities.

#### Coal-lands Litigation.—Granby Co. Successful Before Privy Council.

The Granby Consolidated Mining and Smelting Co. has been successful in its appeal to the Privy Council regarding the Cranberry District coal rights on Vancouver Island according to a cable to the company's solicitors in Vancouver, B. C. The issue of this litigation, it should be explained, is the coal in sixty acres of land acquired with other blocks of land some eighteen months ago and in the opening up and operation of which the Granby Company has invested considerable capital. As a result of the company's enterprise what is known as the Cassidy Collieries, the best equipped of their kind in the Canadian West, exist and from this source it is proposed taking the coal to supply the new by-product ovens at Anyox, which will solve the problem of obtaining coke for the large smelting plant at Anyox.

To revert to the matter of litigation, the case which has had a favorable outcome to the Company was brought by a Chinaman, Bing Kee, who asked that he be declared the owner of the coal rights in the sixty acre tract referred to. In 1905 Bing Kee purchased the property from the Ganner Estate, the trustees for which are Angus Mackenzie and Charles Wilson, two prominent citizens of Nanaimo. Subsequently the Ganner Trustees applied for the coal rights and obtained a Crown Grant to them. The Granby Company purchased the Crown Grant from Messrs. Mackenzie and Wilson for \$45,000 and Bing Kee entered action to have it declared that his deed included the coal. Unfortunately for him the deed has been lost and the evidence appeared to indicate that only the land was intended to be sold. While, however, Bing Kee's suit is dismissed the Granby Company's troubles in regard to this coal are not ended. Another Privy Council decision affecting the same property continues a *lis pendens* filed by the E. & N. Railway Company, which claims that the Provincial Crown Grant to Joseph Ganner is invalid on the ground that the same property was granted to the Company by the Dominion Government as part of its subsidy for the construction of the Island Railway. The action of the E. & N. Railway Company has not yet come to trial. The Granby Company applied to the Supreme Court of B. C. for right to register title to the land and the coal purchased from the Ganner Estate but it was held then, and the judgment now is sustained by the Privy Council, that the *lis pendens* shall continue until the trial. The Granby Company, however, has a third appeal to come before the Privy Council, the contention of this case being that the E. & N. Railway Company has failed to add the Attorney-General of the Province as a defendant in the suit, it being argued that this is a fatal omission as it is the Crown Grant which he issued which is under attack.

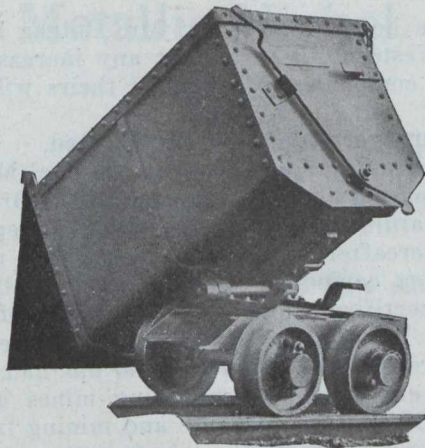
The employees of the Canadian Western Fuel Company will receive an advance of 25 cents a day in their wages as from the 1st of September 1919. This has been announced officially as follows:—

“The request of your Committee for an increase for the employees of the Company on account of the increased cost of living has been given due consideration. To assist in meeting this condition the management will put in effect on September 1st an additional bonus of 25 cents a day. This bonus will remain in effect until such time as the cost of living shall be reduced a like amount.



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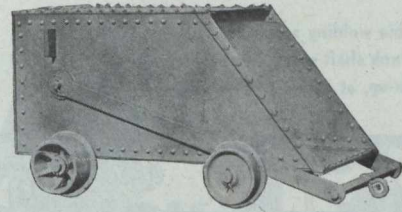
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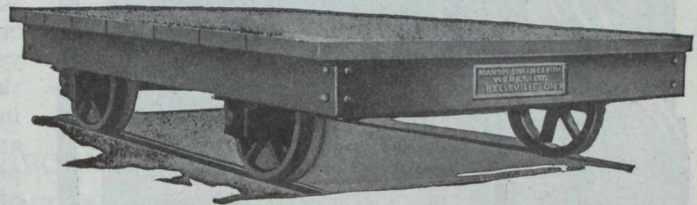
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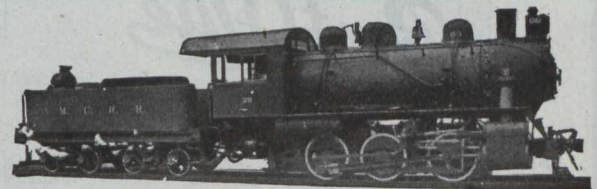
"In this connection attention is called to the fact that the basic scale for both tonnage and shift rates is higher at Nanaimo than in the competitive districts. The management hopes that it will continue to have the co-operation of the employees in its efforts to increase production and in maintaining the high standard of Nanaimo coal."

D. T. Bulger, of the Dominion Department of Labor, has concluded an inquiry into allegations by some of the miners of Nanaimo District that the Canadian Western Fuel Co. was not paying wage increases granted by the Cost of Living Commission as compensation for the fluctuations in the cost of living prices since September, 1918.

That the men who made this charge misunderstood the situation was learned by Mr. Bulger, who explains it as follows: "For the quarter ending December 31st, 1918, the increase was 2¾ cents a day; for the quarter ending March 31st, 1918, 2½ cents a day; and for the quarter ending June 30th, 1919, 14½ cents, making a total increase since September 30th, 1918, of 19¾ cents a day. Through erroneous statements the impression was gaining headway among the miners that they were entitled to 19¾ per cent increase on their base rate instead of a day basis and consequently many believe that they were being victimized by the companies out of increases to which they were justly entitled."

Neither the Canadian Western Fuel Co. or its employers are parties to the arrangement made last year between the Island Operators and the Mines Committees of the various districts for the adjustment of wages by the Cost of Living Commission based on the fluctuations in the cost of living prices, and for this reason together with the fact that their rates

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in many instances are higher than those paid in other localities, do not think they should be penalized by paying the increases awarded by the Commission until the rates being paid by other companies are on a par with theirs.

Assurance has been received by Mr. Bulger from the Canadian Western Fuel Co. that any increase in wages by other companies in excess of theirs will be met promptly.

#### Mine Surveyors Must Be Certificated.

In conformity with an amendment to the Coal Mines Regulation Act passed at the last session of the British Columbia Legislature all plans filed with the Department of Mines hereafter, as provided by the Act, must be prepared by a competent and properly qualified man holding a certificate under the provisions of the Act. From the 1st of October no plans will be accepted unless prepared by a person who has had two years practical experience in surveying mines or is the holder of a diploma in scientific and mining training, after a course of study of at least two years at an educational institution approved, and who is competent to make an accurate survey of the workings of a coal mine and to connect such survey with a surface survey, etc.

#### REGULATIONS OF BRITISH COLUMBIA C. M. R. ACT CONCERNING WINDING ROPES AND CAGES.

Rule 27 of Section 91 is amended by adding the following:

"All cage chains in general use shall be annealed once at least in every six months, and detaching hooks shall be cleaned and refitted once in every three months."

Rule 28 of Section 91 is further amended by adding the following paragraph:

"Every winding-rope shall be given a bath in hot oil before being installed. Every winding-rope shall be recapped at intervals of not more than six months in accordance with regulations made under this Act, and no winding rope which has been in use for more than two years or which has been spliced shall be used for raising or lowering persons."

#### COAL PRODUCTION IN ALBERTA.

By the courtesy of Mr. John T. Stirling, Chief Inspector of Mines for Alberta, we have received the following figures of the coal output of Alberta during the first half of the current year, with a comparison of the figures of the first half of 1918, as follows:

	1919.
Domestic . . . . .	799,724
Bituminous . . . . .	1,227,988
Anthracite . . . . .	41,411
<b>Total output . . . . .</b>	<b>2,069,123</b>
Briquettes . . . . .	46,822
Coke . . . . .	14,599
	1918.
Domestic . . . . .	1,320,143
Bituminous . . . . .	1,502,031
Anthracite . . . . .	75,776
<b>Total output . . . . .</b>	<b>2,897,950</b>
Briquettes . . . . .	53,424
Coke . . . . .	17,963

This shows a reduction for the year 1919, which has been caused through labor conditions



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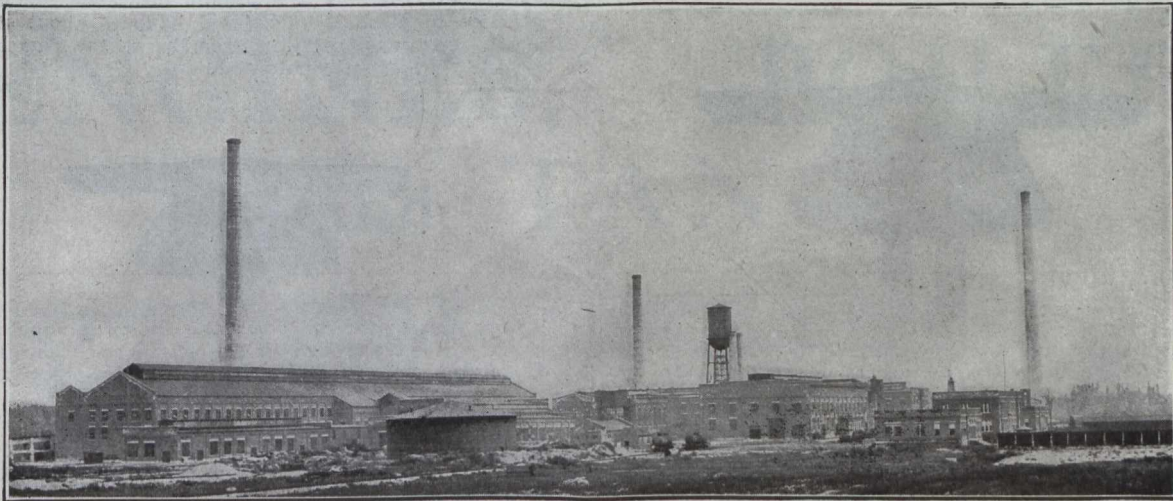
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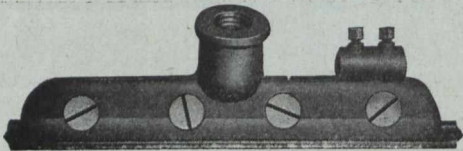
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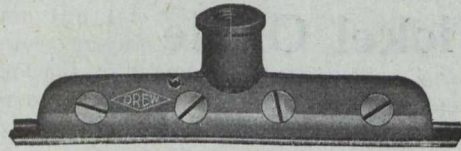
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# DREW OVERHEAD MATERIAL



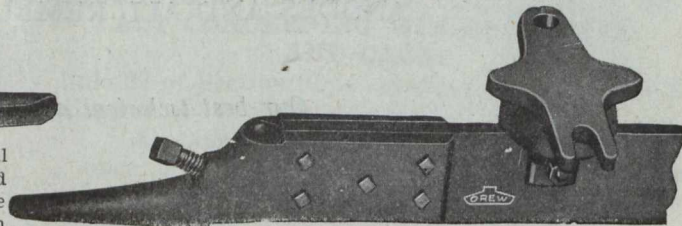
This feed-in-Screw Clamp Trolley Ear is made from bronze with horizontal feeder lug to accommodate 0000 size feeder wire. This can be furnished tinned if so desired.



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This Samson Tunnel approach is for taking trolley into barns, under bridges, elevations or through tunnels, where there is a minimum clearance. It is good practice to place the insulated hangers about six feet apart. The tapered "V" shaped lips of the Samson Approach give smooth under-run.



This hanger has a galvanized Clevis with  $\frac{3}{8}$  x  $1\frac{1}{2}$  in. machine bolt, and is for use in connection with the Samson Tunnel Approach shown above.



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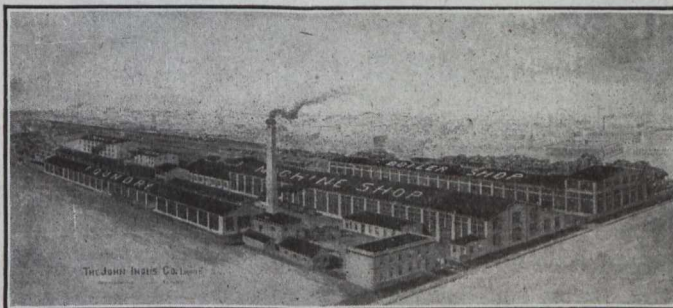
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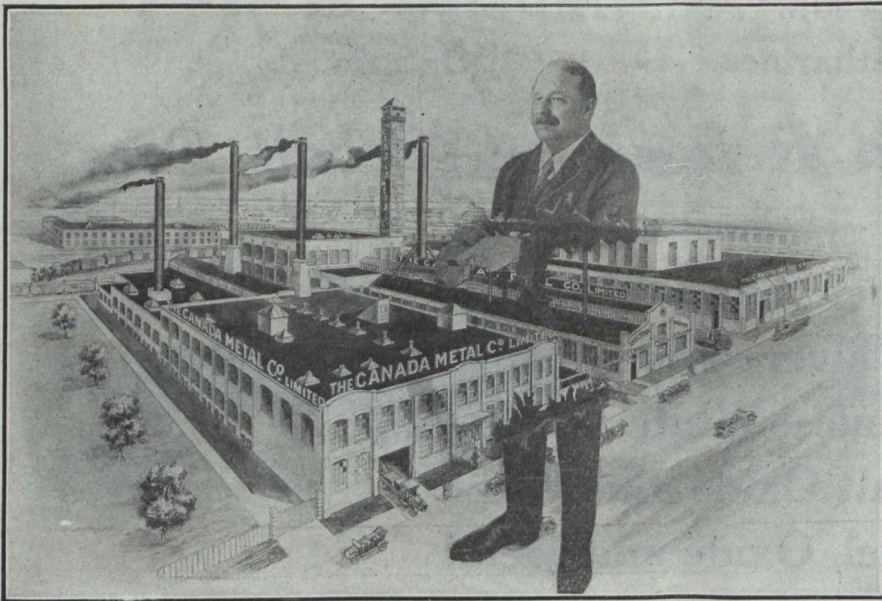
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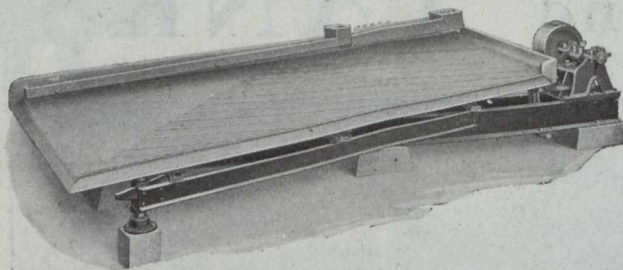
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Which has the greater area, one triangle or two?

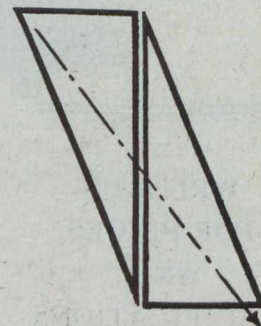
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Hcyt Metal Co.
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Canadian Steel Foundries, Ltd.  
Hull Iron & Steel Foundries Ltd.
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Mine & Smelter Supply Co.  
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Northern Canada Supply Co.  
Jones & Glasco.
- Blasting Batteries and Supplies:**  
Northern Canada Supply Co.  
Canadian Explosives, Ltd.
- Blowers:**  
MacGovern & Co., Inc.  
Northern Canada Supply Co.  
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Northern Canada Supply Co.  
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MacGovern & Co., Inc.  
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The John Inglis Company.
- Boxes, Cable Junction:**  
Standard Underground Cable Co. of Canada, Ltd.  
Northern Electric Co., Ltd.,
- Buckets:**  
Canadian Ingersoll Rand Co., Sherbrooke, Que.  
Hendrick Mfg. Co.  
M. Beatty & Sons, Ltd.  
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Northern Canada Supply Co.  
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- Cable—Aerial and Underground:**  
Northern Canada Supply Co.  
Standard Underground Cable Co. of Canada, Ltd.
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- Cages:**  
Canadian Ingersoll Rand Co., Sherbrooke, Que.  
Northern Canada Supply Co.  
Fraser & Chalmers of Canada, Ltd.
- Cables—Wire:**  
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Canada Wire & Cable Co., Ltd.  
Northern Electric Co., Ltd.,
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Sullivan Machinery Co.  
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Canadian Ingersoll Rand Co., Sherbrooke, Que.  
John J. Gartshore, Toronto, Ont.  
MacKinnon Steel Co., Ltd.  
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Mine & Smelter Supply Co.  
Fraser & Chalmers of Canada, Ltd.
- Car Wheels and Axles:**  
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- Castings (Iron & Steel):**  
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- Cement Machinery:**  
Northern Canada Supply Co.  
Hadfields Ltd.  
Fraser & Chalmers of Canada, Ltd.
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Jones & Glasco.  
Northern Canada Supply Co.
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Mine & Smelter Supply Co.
- Chemists:**  
Canadian Laboratories.  
Campbell & Deyell.  
Thos. Heyes & Sons.  
Milton Hersey Co.  
Ledoux & Co.
- Classifiers:**  
Mine & Smelter Supply Co.
- Coal:**  
Dominion Coal Co.  
Nova Scotia Steel & Coal Co.
- Coal Cutters:**  
Sullivan Machinery Co.  
Can. Ingersoll-Rand Co., Ltd., Montreal, Que.
- Coal Mining Explosives:**  
Canadian Explosives, Ltd.
- Coal Mining Machinery:**  
Canadian Ingersoll-Rand Co., Ltd., Montreal, Que.  
Sullivan Machinery Co.  
Marsh Engineering Works.  
Hadfields, Ltd.  
Fraser & Chalmers of Canada, Ltd.
- Coal Pick Machines:**  
Sullivan Machinery Co.
- Compressors—Air:**  
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Canadian Ingersoll-Rand Co., Ltd., Montreal, Que.  
Northern Canada Supply Co.  
MacGovern & Co., Inc.  
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Fraser & Chalmers of Canada, Ltd.
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Northern Canada Supply Co.  
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- Conveyor—Trough—Belt:**  
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Canadian Steel Foundries, Ltd.  
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Hadfields Ltd.  
Fraser & Chalmers of Canada, Ltd.
- Derricks:**  
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M. Beatty & Sons, Ltd.  
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- Drills, Air and Hammer:**  
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Sullivan Machinery Co.  
Northern Canada Supply Co.  
Canadian Rock Drill Co.
- Drills—Core:**  
Canadian Ingersoll-Rand Co., Ltd., Montreal, Que.  
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Standard Diamond Drill Co.  
Sullivan Machinery Co.
- Drills—Diamond:**  
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- Drill Steel Sharpeners:**  
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Canadian Rock Drill Co.
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Northern Electric Co., Ltd.,
- Drills—High Speed and Carbon:**  
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Northern Canada Supply Co.  
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Fraser & Chalmers of Canada, Ltd.
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Smart-Turner Machine Co.  
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MacGovern & Co., Inc.
- Engines—Haulage:**  
Canadian Ingersoll-Rand Co., Ltd., Montreal, Que.  
Marsh Engineering Works.  
Fraser & Chalmers of Canada, Ltd.
- Engines—Marine:**  
Smart-Turner Machine Co.  
MacGovern & Co., Inc.
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Fraser & Chalmers of Canada, Ltd.
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M. Beatty & Sons.  
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Fraser & Chalmers of Canada, Ltd.
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- Furnaces—Assay:**  
Lymans Ltd.  
Mine & Smelter Supply Co.
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Northern Canada Supply Co.
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Canadian Steel Foundries, Ltd.  
The Hamilton Gear & Machine Co.  
Fraser & Chalmers of Canada, Ltd.



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## Canadian Miners' Buying Directory.—(Continued from page 29.)

**Gears:**

Canadian Steel Foundries, Ltd.  
Smart-Turner Machine Co.  
Northern Canada Supply Co.  
The Hamilton Gear & Machine Co.  
Fraser & Chalmers of Canada, Ltd.

**Hammer Rock Drills:**

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real, Que.  
Jones & Glassco.  
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Northern Canada Supply Co.  
Mine and Smelter Supply Co.  
Fraser & Chalmers of Canada, Ltd.

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Can. Ingersoll-Rand Co., Ltd.  
M. Beatty & Sons.  
Marsh Engineering Works.  
Fraser & Chalmers Engineering  
Works.  
Fraser & Chalmers of Canada, Ltd.

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Northern Canada Supply Co.

**Hydraulic Machinery:**

Hadfields Ltd.  
MacGovern & Co., Inc.  
Fraser & Chalmers of Canada, Ltd.

**Ingot Copper:**

Canada Metal Co., Ltd.  
Hoyt Metal Co.

**Insulating Compounds:**

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Canada, Ltd.

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Can. Brakeshoe Co., Ltd.  
Northern Canada Supply Co.

**Laboratory Machinery:**

Mine & Smelter Supply Co.

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Canada Carbide Company, Ltd.  
Dewar Mfg. Co., Inc.  
Northern Electric Co., Ltd.,

**Locomotives (Steam, Compressed Air  
and Storage Steam):**

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John J. Gartshore, Toronto, Ont.  
R. T. Gilman & Co.  
Fraser & Chalmers of Canada, Ltd.

**Link Belt:**

Northern Canada Supply Co.  
Jones & Glassco.

**Manganese Steel:**

Canadian Steel Foundries, Ltd.  
Hadfields Ltd.  
Fraser & Chalmers of Canada, Ltd.

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Geo. G. Blackwell, Sons, & Co.  
Consolidated Mining and Smelting  
Co. of Canada.  
Canada Metal Co.  
C. L. Constant Co.  
Everitt & Co.

**Mining Requisites:**

Canadian Steel Foundries, Ltd.  
Hadfields Ltd.  
Fraser & Chalmers of Canada, Ltd.

**Monel Metal:**

International Nickel Co.

**Motors:**

R. T. Gilman & Co.

**Nickel:**

International Nickel Co.

**Ore Sacks:**

Northern Canada Supply Co.

**Ore Testing Works:**

Ledoux & Co.  
Can. Laboratories.  
Milton Hersey Co., Ltd.  
Campbell & Deyell.  
Hoyt Metal Co.

**Ores and Metals—Buyers and Sellers of:**

C. L. Constant Co.  
Geo. G. Blackwell.  
Consolidated Mining and Smelting  
Co. of Canada.

**Orford Copper Co.**

Canada Metal Co.  
Hoyt Metal Co.  
Everitt & Co.

**Perforated Metals:**

Northern Canada Supply Co.  
Hendrick Mfg. Co.

**Pig Tin:**

Canada Metal Co., Ltd.  
Hoyt Metal Co.

**Pig Lead:**

Canada Metal Co., Ltd.  
Hoyt Metal Co.

**Pipes:**

Canada Metal Co., Ltd.  
Consolidated M. & S. Co.  
Northern Canada Supply Co.  
Smart-Turner Machine Co.

**Pipe—Wood Stave:**

Pacific Coast Pipe Co., Ltd.  
Mine and Smelter Supply Co.

**Piston Rock Drills:**

Canadian Ingersoll-Rand Co., Ltd.,  
Montreal, Que.  
Mussens, Limited.

**Plate Work:**

Canadian Ingersoll-Rand Co., Ltd.,  
Montreal, Que.  
John Inglis Co., Ltd.

**Pneumatic Tools:**

Can. Ingersoll-Rand Co., Ltd.  
Jones & Glassco.

**Prospecting Mills and Machinery:**

E. J. Longyear Company.  
Standard Diamond Drill Co.  
Mine & Smelter Supply Co.  
Fraser & Chalmers of Canada, Ltd.

**Pulleys, Shafting and Hangings:**

Northern Canada Supply Co.

**Pulverizers—Laboratory:**

Mine & Smelter Supply Co.

**Pumps—Boiler Feed:**

Smart-Turner Machine Co.  
Northern Canada Supply Co.  
Canadian Ingersoll-Rand Co., Ltd.  
Fraser & Chalmers of Canada, Ltd.

**Pumps—Centrifugal:**

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Smart-Turner Machine Co.  
M. Beatty & Sons.  
Canadian Ingersoll-Rand Co., Ltd.  
Mine & Smelter Supply Co.  
Fraser & Chalmers of Canada, Ltd.

**Pumps—Electric:**

Mine & Smelter Supply Co.

**Pumps—Pneumatic:**

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Montreal, Que.  
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Sullivan Machinery Co.

**Pumps—Steam:**

Canadian Ingersoll-Rand Co., Ltd.  
Mussens, Limited.  
Northern Canada Supply Co.  
Smart-Turner Machine Co.  
R. T. Gilman & Co.  
Fraser & Chalmers of Canada, Ltd.

**Pumps—Turbine:**

Smart-Turner Machine Co.  
Canadian Ingersoll-Rand Co., Ltd.  
Fraser & Chalmers Engineering  
Works.  
Fraser & Chalmers of Canada, Ltd.

**Pumps—Vacuum:**

Smart-Turner Machine Co.

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Canadian Ingersoll-Rand Co., Ltd.  
Hadfields Ltd.

**Rails:**

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R. T. Gilman & Co.

**Roofing:**

Northern Canada Supply Co.

**Rope—Manilla and Jute:**

Jones & Glassco.  
Northern Canada Supply Co.  
Allan, Whyte & Co.

**Rope—Wire:**

Allan, Whyte & Co.  
Northern Canada Supply Co.

**Rolls—Crushing:**

Canadian Ingersoll-Rand Co., Ltd.,  
Montreal, Que.  
Canadian Steel Foundries, Ltd.  
Hadfields Ltd.

**Samplers:**

Fraser & Chalmers of Canada, Ltd.  
C. L. Constant Co.  
Ledoux & Co.  
Milton Hersey  
Thos. Heyes & Son.  
Mine & Smelter Supply Co.  
Fraser & Chalmers of Canada, Ltd.

**Screens:**

Northern Canada Supply Co.  
Hendrick Mfg. Co.  
Hadfields Ltd.

**Screens—Cross Patent Flanged Lip:**  
Hendrick Mfg. Co.

**Separators:**

Smart-Turner Machine Co.

**Sheet Lead:**

Canada Metal Co., Ltd.

**Sheets—Genuine Manganese Bronze:**

Hendrick Mfg. Co.

**Shoes and Dies:**

Canadian Foundries and Forgings,  
Ltd.  
Fraser & Chalmers of Canada, Ltd.

**Shovels—Steam:**

Canadian Steel Foundries, Ltd.  
John J. Gartshore, Toronto, Ont.  
M. Beatty & Sons.  
R. T. Gilman & Co.

**Smoke Stacks:**

Canadian Ingersoll-Rand Co., Ltd.,  
Montreal, Que.  
Hendrick Mfg. Co.  
MacKinnon Steel Co., Ltd.  
Marsh Engineering Works.

**Special Machinery:**

Montreal, Que.  
Canadian Ingersoll-Rand Co., Ltd.,  
John Inglis Co., Ltd.

**Spring Coil & Clips Electric:**

Canadian Steel Foundries, Ltd.

**Steel Barrels:**

Smart-Turner Machine Co.  
Fraser & Chalmers of Canada, Ltd.

**Steel Castings:**

Canadian Brakeshoe Co., Ltd.  
Canadian Steel Foundries, Ltd.  
Hadfields Ltd.

**Steel Drills:**

Northern Canada Supply Co.  
Can. Ingersoll-Rand Co., Ltd.

**Steel Drums:**

Smart-Turner Machine Co.

**Steel—Tool:**

N. S. Steel & Coal Co.  
Hadfields Ltd.

**Stone Breakers:**

Canadian Ingersoll-Rand Co., Ltd.,  
Montreal, Que.  
Hadfields Ltd.  
Fraser & Chalmers of Canada, Ltd.

**Surveying Instruments:**

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**Switches & Switch Stand:**

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John J. Gartshore, Toronto, Ont.

**Tables—Concentrating:**

Mine & Smelter Supply Co.  
Fraser & Chalmers of Canada, Ltd.

**Tanks (Wooden):**

Gould, Shapley & Muir Co., Ltd.  
Pacific Coast Pipe Co., Ltd.

**Tanks—Steel:**

Canadian Ingersoll Rand Co., Sher-  
brooke, Que.  
Marsh Engineering Works.  
MacKinnon Steel Co.  
Fraser & Chalmers of Canada, Ltd.

**Tanks—Cyanide, Etc.:**

Canadian Ingersoll-Rand Co., Ltd.,  
Montreal, Que.  
Hendrick Mfg. Co.  
Pacific Coast Pipe Co., Ltd.  
MacKinnon Steel Co.  
Fraser & Chalmers of Canada, Ltd.

**Tanks (water) and Steel Towers:**

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MacKinnon Steel Co.

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Northern Electric Co., Ltd.,

**Tubs:**

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Imperial Brass Mfg. Co.

**Welding and Cutting, Oxy-Acetylene:**

Prest-O-Lite Co. of Canada, Ltd.  
Imperial Brass Mfg. Co.

**Wheels and Axles:**

Canadian Steel Foundries, Ltd.  
John J. Gartshore, Toronto, Ont.  
Hadfields Ltd.

**Winding Engines—Steam and Electric:**

Can. Ingersoll-Rand Co., Ltd.  
Marsh Engineering Works.  
Fraser & Chalmers of Canada, Ltd.

**Wire:**

Canada Wire & Cable Co., Ltd.

**Wire Cloth:**

Northern Canada Supply Co.  
Greening, B., Wire Co.

**Wire (Bare and Insulated):**

Standard Underground Cable Co.,  
of Canada, Ltd.  
Northern Electric Co., Ltd.,

**Zinc Spelter:**

Canada Metal Co., Ltd.  
Hoyt Metal Co.



ALPHABETICAL INDEX TO ADVERTISERS

**A**

Allen Whyte & Co. . . . . 28  
 American Zinc Lead & Smelting Co. . . . . 33

**B**

Balbach Smelting & Refining Co. 10  
 Blackwell, G. C., Sons & Company 12  
 Beatty, M. & Sons . . . . . 12  
 Berger C. L. & Sons . . . . . 12  
 Brigstocke, R. W. . . . . 11  
 British Columbia, Province of . . . . . 9  
 Burns & Roberts . . . . . 24  
 Burnett & Crampton . . . . . 24

**C**

Canadian Allis Chalmers . . . . . 6  
 Can. Chicago Bridge & Iron Works 9  
 Canadian Explosives, Ltd. . . . . 30  
 Canadian Fairbanks-Morse Co., Ltd. 16  
 Canadian H. K. Porter, Ltd. . . . . 2  
 Canadian Milk Products . . . . . 25  
 Canadian National Railways . . . . . 8  
 Canadian Laboratories, Ltd. . . . . 12  
 Canadian Link Belt Co. . . . . 3  
 Canadian Ingersoll Rand Co., Ltd. . . 3  
 Canada Foundries & Forgings, Ltd. . . . . 10  
 Canadian Wire & Cable Co. . . . . 33  
 Canadian Rock Drill Co. . . . . 1  
 Canadian Steel Foundries . . . . . 28  
 Canada Carbide Company . . . . . 7  
 Canada Metal Co. . . . . 12  
 Canadian Brakeshoe Co. . . . . 9  
 Canadian Sirocco Co. . . . . 12  
 Capper Pass & Son, Ltd. . . . . 7  
 Consolidated Mining & Smelting Co. 9  
 Coniagas Reduction Co. . . . . 12  
 Constant, C. L. & Co. . . . . 7

**D**

Deister Concentrator Co. . . . . 28  
 Denver Rock Drill Mfg. Co. . . . . 33  
 Deloro Smelting & Refining Co. . . . 4  
 Department of Mines, Canada . . . . . 2  
 Dewar Mfg. Co. . . . . 8  
 Diamond Drill Carbon Co. . . . . 32  
 Diamond Drill Contracting Co. . . . . 12  
 Dominion Coal Co., Ltd. . . . . 11  
 Dorr Co. . . . . 11  
 Dresser, Jno. A. . . . . 11  
 Dunlop Tire & Rubber Co., Ltd. . . . . 12  
 Dwight & Lloyd Sintering Co. Inc. 12  
 Dom. Engineering & Inspection Co., Ltd. . . . . 10

**E**

Electric Steel & Metals Co. . . . . 7  
 Engineering & Machine Works of Canada . . . . . 7  
 Everett & Co. . . . . 10

**F**

Fleck, Alex. . . . . 11  
 Ferrier, W. F. . . . . 11  
 Fasken, Robertson, Chadwick & Sedgewick . . . . . 10  
 Fraser & Chalmers of Canada, Ltd. . . . . 12

**G**

Gartshore, John J. . . . . 12  
 General Engineering Co. . . . . 12  
 Gilman, R. T. . . . . 8  
 Goldie & McCullough . . . . . 10  
 Goldsmith Bros., Smelting & Refining Co., Ltd. . . . . 10  
 Greening, B. Wire Co. . . . . 10  
 Goodyear Tire & Rubber Co. of Canada, Ltd. . . . . 10

**H**

Hadfields, Ltd. . . . . 32  
 Hall, G. C. & Co. . . . . 10  
 Hamilton Gear & Machine Co. . . . . 16  
 Hardinge Conical Mill Co., Ltd. . . . 11  
 Hassan A. A. . . . . 12  
 Hendrick Mfg. Co. . . . . 11  
 Hersey, Milton Co., Ltd. . . . . 11  
 Heys Thomas & Son . . . . . 14  
 Hull Iron & Steel Foundries, Ltd. . . 11  
 Hore, Reginald E. . . . . 22  
 Hoyt Metal Co. . . . . 8

**I**

Imperial Bank of Canada . . . . . 4  
 Imperial Oil Co. . . . . 4  
 International Business Machines . . . . 25  
 International High Speed Steel Co. . . . 25  
 International Nickel Co. of Canada, Limited . . . . . 27  
 International Nickel Co. . . . . 27  
 Inglis, J. & Co. . . . . 10

**J**

Johnston, Matthey & Co. . . . . 10  
 Jones & Glassco . . . . . 12

**K**

Kemp, J. Colin . . . . . 12

**L**

Laurie & Lamb . . . . . 10  
 Ledoux & Co. . . . . 11  
 Lindsey, G. C. S. . . . . 6  
 Longyear, E. J. Company . . . . . 9  
 Lymans, Ltd. . . . . 11

**M**

McDonald, M. P. . . . . 11  
 MacGovern & Co., Inc. . . . . 24  
 MacKinnon Steel Co., Ltd. . . . . 11  
 Marsh Engineering Works, Ltd. . . . . 24  
 McEvoy, Jas. . . . . 11  
 Mine & Smelter Supply Co. . . . . 6  
 Mond Nickel Co. . . . . 5  
 Mussels, Ltd. . . . . 13

**N**

Northern Canada Supply Co. . . . . 26  
 Northern Electric Co., Ltd. . . . . 6  
 Nova Scotia Steel & Coal Co. . . . . 5  
 Nova Scotia Government . . . . . 13

**O**

Ontario, Province of . . . . . 13

**P**

Pacific Coast Pipe Co., Ltd. . . . . 10  
 Peacock Bros., Ltd. . . . . 7  
 Pennsylvania Smelting Co. . . . . 24  
 Powley & Townsley . . . . . 24  
 Prest-O-Lite Co. of Canada, Ltd. . . . . 24

**Q**

Quebec Asbestos & Chrome Co. . . . . 5  
 Quebec, Province of . . . . . 24

**R**

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

**S**

Smart-Turner Machine Co. . . . . 10  
 Smith & Travers Company . . . . . 10  
 Standard Underground Cable Co. of Canada, Ltd. . . . . 11  
 Stewart, Robert H. . . . . 10  
 Sudbury Diamond Drilling Co., Ltd. 10  
 Sullivan Machinery Co. . . . . 11  
 Swedish Steel & Importing Co. . . . . 11

**T**

Toronto Iron Works . . . . . 11  
 Tyrrell, J. B. . . . . 7

**U**

University of Toronto . . . . . 11

**W**

Wabi Iron Works . . . . . 11  
 Whitman, Alfred R. . . . . 11

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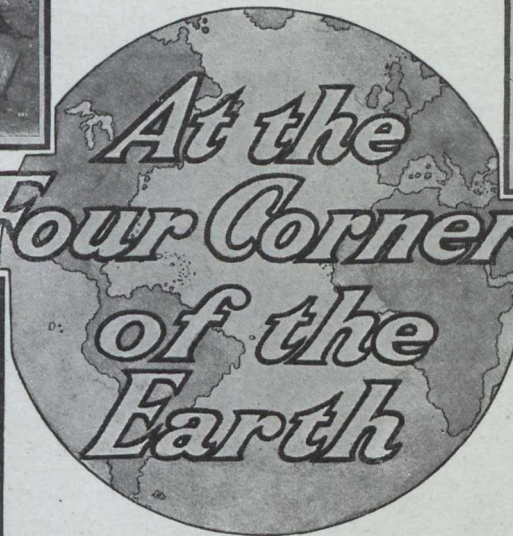
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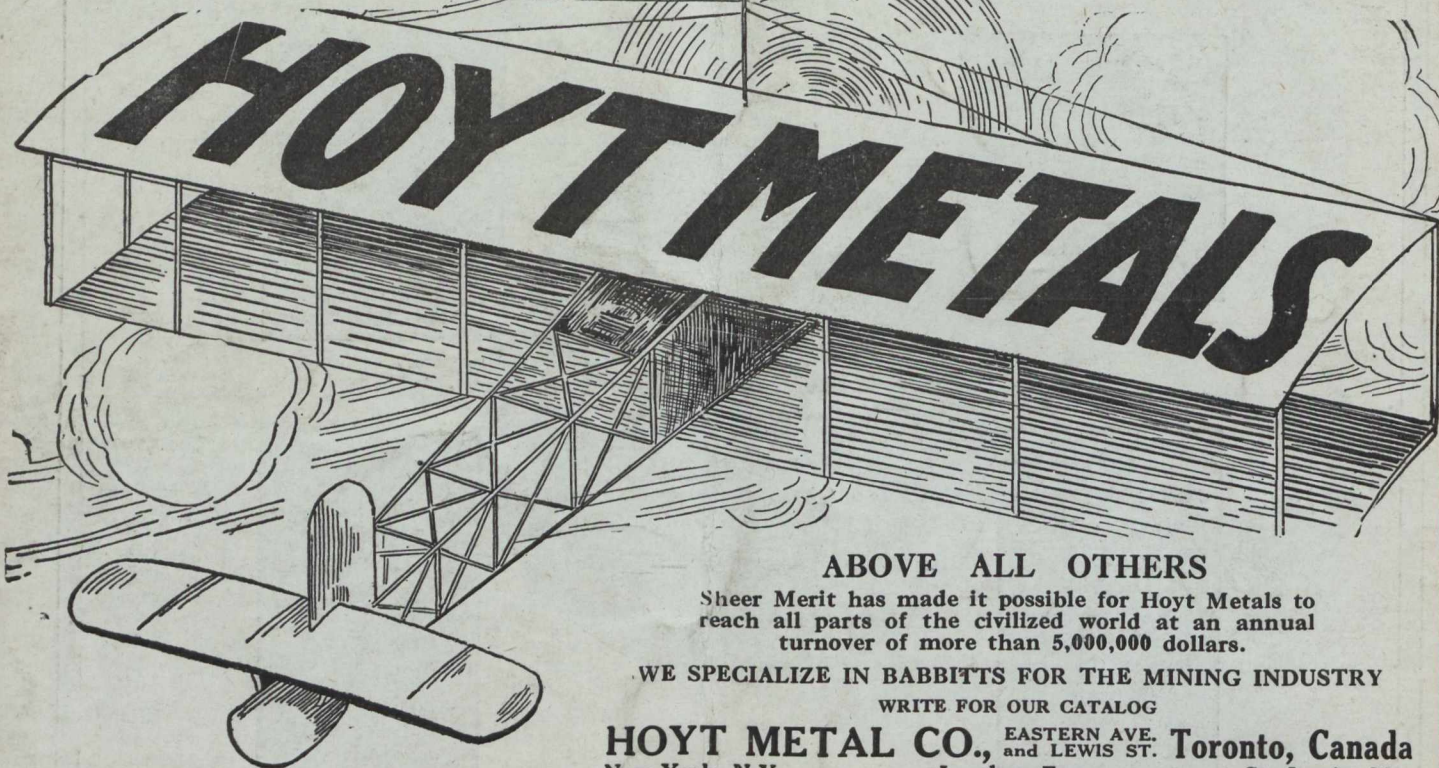
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