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DEPARTMENT OF MINES  
OTTAWA, CANADA

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THE CANADIAN MINERAL INDUSTRY IN 1928

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THE CANADIAN MINERAL INDUSTRY DURING 1928

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NOTE:

The figures of production are preliminary figures, as published by the Dominion Bureau of Statistics.

The figures of Imports and Exports are taken from the "Trade of Canada", Dominion Bureau of Statistics and cover the calendar year.

## ANTIMONY IN 1928

### Production:

There was no production of antimony ore, concentrates or of antimony regulus in 1928.

Small quantities of antimony are contained in the silver-lead-bismuth bullion obtained as a by-product in the treatment of the silver-cobalt-nickel-arsenic ores at Meloro, Ontario. This bullion is exported to the United States for further treatment.

The Consolidated Mining and Smelting Co. produce some impure antimony as a by-product in connexion with their silver refining operations at Trail, B.C. This product is allowed to accumulate at the smelter until the company decide to install the necessary equipment to treat it.

### Exports:

Nil.

### Imports:

Imports in 1928 were:— metallic antimony or regulus 1,529,823 lbs. valued at \$140,958, and salts of antimony 23,024 lbs. valued at \$5,326.

### Ores Mined and Producing-Localities:

No antimony ores or refined antimony have been produced since 1917 when shipments of 361 tons of ore valued at \$22,000 were made. Small experimental shipments were made in 1925, 1926, and 1927.

Small amounts of refined antimony as well as antimony ores were produced intermittently for a number of years in the Maritime Provinces.

### Important Developments and Prospective Producing-Localities:

The Lake George property was taken over in 1927 by the Canadian International Corporation, 1472 Sherbrooke St. W., Montreal, which company through its subsidiary, the Antimony Smelting and Refining Co. Ltd., expect to start active mining operations in 1929.

### General Situation, Market Conditions, etc.:

The price of antimony in 1928 was fairly uniform around 10½ cents per pound. The minimum was 9½ cents and a maximum of 11¼ cents, and the year closed with the price at about 9¾ cents. While Bolivia and Mexico are important producers of antimony the bulk of the production comes from China and market conditions are more or less governed by the existing conditions in that country.

The imports into the United States, which is the largest consuming country, amounted to about 10,000 tons in 1928, as against 12,400 in 1927 and 14,700 in 1926. On the other hand the production of secondary antimony has been increasing rapidly, so that the real consumption may not have dropped as much as the figures of production appear to indicate.

CADMIUM IN 1928Production:

Cadmium was produced in Canada for the first time in 1928, and the production, which is in metallic form, amounted to 491,894 pounds valued at \$341,274.

Exports:

All the cadmium produced is being exported, chiefly to Europe, with some going to the Orient.

Imports:

None recorded.

Ores Mined and Producing Localities:

Cadmium is not mined as an ore, but is a by-product obtained in the production of zinc, and, in some cases, of lead, as cadmium is contained in most zinc ores and in some lead ores, although in both cases the amount is very low.

The new recovery plant of the Consolidated Mining and Smelting Co. at Tadanac, B.C., first started production early in 1928 and has since been treating accumulated zinc residues.

Important Developments and Prospective Producing Localities:

The only important development to report is, as above stated, the putting in operation of the cadmium refinery at Tadanac which produces metallic cadmium. It has recently been reported that two new zinc refineries will shortly be erected in Eastern Canada — one by the Consolidated Mining and Smelting Co. in association with Ventures Ltd., and the other by the Noranda Mines Ltd. in association with the British Metals Corporation Ltd. and the Nichols Copper Co. of the United States. It is possible that both of these plants may eventually produce cadmium residues, and erect the necessary recovery plants if market conditions justify such a course.

General Situation, Market Conditions, etc.:

While the possibilities of production of cadmium are great, the market is rather restricted. Nevertheless, the market during the last year has been buoyant, owing to the fact that the application of this metal for plating purposes has developed rapidly and increased the consumption beyond expectations. Moreover, cadmium is being employed by colour makers to a greater extent because of the increased use of "Cadmopone". It is also used in the manufacture of fusible alloys, as an ingredient of special amalgams, and salts of cadmium find application in the arts, medicine, dyeing, etc.

Cadmium is marketed mainly in metallic form 99.5% pure and better, and as a sulphide.

The price has been characterized by some remarkable fluctuations. In 1928 it increased 100 per cent to a maximum of about 90 cents per pound. The London price at present ruling is 4s.6d., while the New York price is 85 to 90 cents per pound. The American product is protected by a duty of 15 cents per pound.

The world's production in 1928 is estimated at 1,100 tons. The chief producers are: the Anaconda Company in the United States; the Electrolytic Zinc Co. of Australia; the Consolidated Mining and Smelting Co. of Canada, and the American-Geische A.G., in Upper Silesia.

COBALT IN 1928Production:

The estimated production of cobalt in 1928 was valued at \$1,671,900, including metal, alloys and chemical compounds.

Exports:

Metallic cobalt .....	240,966 lbs. valued at \$467,663
Cobalt alloys .....	17,601 " " " 84,920
Cobalt oxides and salts ....	369,783 " " " 650,981
Cobalt ore .....	" " " 530,897

Imports:

Cobalt ore .....	---	---
Colours, metallic viz., oxides of cobalt, tin and copper.	266,749 " " "	133,818

Ores Mined and Producing-Localities:

Most of the cobalt produced in Canada is a by-product of the silver-mining industry and is obtained by treating arsenical silver-cobalt-nickel residues from the Cobalt, South Lorrain, and Gowganda silver camps. For cobalt recovery the residues are smelted in blast furnaces, one of the products being speiss, consisting of arsenides of cobalt, nickel and other metals. The speiss is given a chloridizing roast and leached leaving a residue of mixed oxide of cobalt, nickel and iron. These are dissolved in acid and the three metals separated by fractional precipitation, the cobalt as hydroxide. The hydroxide is heated to change it to  $\text{Co}_3\text{O}_4$  which can then be reduced to metallic cobalt with carbon, or used to make cobalt compounds.

In addition to by-product cobalt a certain amount of low-silver high-cobalt ore is mined primarily for its cobalt content. Most of this is exported, chiefly to Germany. The Deloro Smelting and Refining Company of Deloro, Ont., is the only company in America producing Cobalt metal, oxides and salts.

Canadian nickel ores contain small amounts of cobalt and Canadian made nickel as marketed is said to carry on the average 0.5 per cent cobalt. This is not deleterious for most purposes and counts as nickel in the commercial metal. Mond nickel is practically cobalt free but no figures are available showing the recovery of cobalt from nickel ores treated by the Mond process.

Important Developments and Prospective Producing-Localities:

A discovery of cobalt on Boulder Creek in the Cowichan district, British Columbia was reported during the year.

General Situation, Market Conditions, etc.:

Practically all the world's production of cobalt has its origin either in Canada or the Belgian Congo, the latter country promising to become the chief source in the future.

The chief use of metallic cobalt is as a constituent of the cobalt-chromium alloy, stellite and the cobalt-iron alloy used for permanent magnets. The oxide is used largely in the ceramic industry. A new tungsten-carbon-cobalt alloy developed in the research laboratories of the General Electric Company and said to possess some very remarkable properties has recently been put on the market under the trade name carboloy.

Quotations for cobalt metal and oxide were steady throughout the year at:

\$2.50 to \$3.00 per lb. for metal (shot) and
\$2.10 " " " black oxide, f.o.b., Canadian works.

## COPPER IN 1928

### Production:

Copper produced in Canada in 1928 amounted to 100,970 tons valued at \$28,488,118, as against 70,074 tons valued at \$17,195,487 in 1927.

### Exports:

Copper in ore, matte, blister, etc. valued at \$23,595,415.

### Imports:

Copper in blocks, pigs, scrap, bars, etc. valued at \$11,021,950.

### Ores Mined and Producing-Localities:

The British Columbia ores are chiefly low-grade chalcopyrite carrying small amounts of gold and silver and are concentrated before smelting; The Ontario ores are the nickeliferous pyrrhotite chalcopyrite ores of the Sudbury district; and in Quebec the main production is derived from the chalcopyrite-sphalerite ores of Rouyn and adjoining areas, supplemented with a production in the form of concentrates obtained from the treatment of the low-grade cupriferous pyrites of the Eastern townships.

Part of the year's output is to be credited to Ontario, obtained mostly from the nickel-copper mattes produced at Sudbury, Ont.; the remainder to British Columbia sources, with the exception of a small amount of concentrates shipped from Eustis, Quebec, to United States smelters and the blister copper produced at Noranda. The concentrates from the Granby Co.'s mine at Copper Mountain near Princeton, B.C., which had been treated under contract by the Consolidated Mining and Smelting Co. are now being shipped for treatment to Tacoma, Washington.

### Important Developments and Prospective Producing-Localities:

Considerable bodies of copper-zinc ore have been developed at the Horne, Amulet, Waite and Aldermac mines in western Quebec, and a number of other promising prospects are being actively explored in the same district. Production from this source started in December 1927, with the blowing in of the first unit of the Noranda smelter which is at present operating at the rate of over 900 tons of ore per day.

The successful developments carried on these last few years by the International Nickel Co. at the Frood mine and by the Mond Nickel Co. at the Frood Extension mine, has added considerably to the copper as well as the nickel ore reserves of the Sudbury region. This is being followed up by both companies with important extensions in milling and smelting equipment and by the Consolidated Mining and Smelting Co. and the Noranda Mines Ltd. with the construction of copper refineries in eastern Canada.

The Flin Flon mine in northern Manitoba, owned by the Hudson Bay Mining and Smelting Co., and operated by the Flin Flon Mines, Ltd., has been under active development these last three years. A small pilot mill was completed in 1927 and has been in operation producing copper and zinc concentrates. The 85 mile extension branch from Mile 6 of the Hudson Bay railway has been completed, and the erection of the necessary metallurgical works is underway. A large body of copper-zinc ores has also been opened up at the Sherritt-Gordon property about 42 miles northeast of the Flin Flon mine, and the railway is being extended to this property. The Mandy mine which was producing during the war period and is situated on Athapapuskow lake was re-opened in 1928.

There have also been important new developments in British Columbia at some of the properties of established producers, and new discoveries have also been made.

### General Situation, Market Conditions, etc.:

The prevailing low price of copper during the past few years tended to curtail operations. This was offset to some extent by improved methods of concentration and metallurgical treatment. The recent strengthening of the price of copper to  $17\frac{3}{4}$  cents per pound should have a very stimulating effect on Canadian production.

## GOLD IN 1928

### Production:

Gold production in Canada in 1928 was 1,891,050 ounces, valued at \$39,091,472 as compared with 1,852,785 ounces, valued at \$38,300,465 in 1927.

### Exports:

Gold-bearing quartz, dust, nuggets, and bullion direct from the mines valued at \$10,457,877; Gold Coin, (Foreign), valued at \$56,131,042, and Gold Bullion (Canadian), valued at \$21,067,802 and (Foreign) \$27,346,696.

Most of the bullion is now refined in the Royal Mint, Ottawa.

### Imports:

Coins valued at \$27,654,313, and bullion in bars, clocks, etc., unmanufactured valued at \$925,612. Gold fringe and bullion \$47,537, manufactures of gold \$58,275. (Articles of gold and silver in which the two metals are not valued separately \$1,426,909).

### Ores Mined and Producing-Localities:

The chief source of the gold produced in Canada is the gold-bearing quartz deposits of the Porcupine and Kirkland Lake districts in Ontario which are responsible for more than 85 per cent of the output. British Columbia, which is the second gold-producing province derives part of its output from placers and part from gold-quartz veins worked exclusively for their gold-silver content, but the greater part is won as a by-product of the working of base metal sulphide ores, notably of low-grade copper ores and silver-lead-zinc ores. Quebec now has a considerable gold production obtained from high-grade gold-copper sulphide ores and also a smaller amount contained in lead, zinc and copper concentrates exported for treatment. Lode gold is recovered from auriferous quartz veins in Manitoba and Nova Scotia. The Yukon output is placer gold.

### Important Developments and Prospective Producing-Localities:

Probably the most striking development during the year was the large increase in the output of the Kirkland Lake mines which promises to amount to 50 per cent more than that of 1927. The appearance of Quebec among the more important of the gold producing provinces as a result of the continuous operation of the Noranda smelter throughout the year is also a matter of considerable interest. On the other hand the output of the Porcupine camp has shown a falling off entirely due to decreased output from the Hollinger. This may in part be attributed to the effects of the fire that occurred in the mine in February, but the published mill returns show a falling off in grade and tonnage milled that cannot entirely be accounted for by the fire, which though disastrous to human life had little and only temporary adverse effects on the physical condition of the mine.

Amongst the newer properties in western Ontario that give promise of becoming productive in the near future and where mills may be warranted are the How mine in Red Lake, and the Minto and Grace mines in Michipicoten. In Quebec we might mention the Siscoe mine in Abitibi, at which property a small mill was put in operation in the latter part of 1928.

IRON ORE IN 1928

Production:

Ore for iron-making has not been mined in Canada for a number of years.

Exports:

Iron ore, 2,615 tons valued at \$12,500.

Imports:

	<u>Tons</u>	<u>Value</u>
From Newfoundland.....	584,096	\$ 584,118
Europe or North Africa..	74,817	321,873
United States.....	1,563,984	3,419,168

Ores Mined and Producing-Localities:

The three iron-making centres in Canada are: Sydney, Nova Scotia on the Atlantic coast, and Hamilton and Sault Ste. Marie in the inland province of Ontario. The Sydney furnaces procure almost all their ore from their own mines at Wabana, Newfoundland but do, however, often import also from Europe or North Africa small amounts of special ores for mixing in the production of certain grades of iron. All the United States ore imported is used in the Ontario furnaces, which depend entirely on the United States Lake Superior district for their supply.

Important Developments and Prospective Producing-Localities:

There are no large known bodies of high-grade iron ore in Canada that could be made tributary to Canadian furnaces. There are, however, two very large partly developed, but unequipped, deposits of low grade ore in Ontario. The Algoma Steel Corporation's New Helen mine in the Michipicoten district has proved reserves variously estimated at 60,000,000 to 80,000,000 tons of low grade rather sulphury iron carbonate that requires roasting to fit for use in the blast furnace. A similar ore was formerly worked by the same company at their Maggie mine, also in the Michipicoten district, but this is not at present profitable. In the Sudbury district Moose Mountain Ltd. have developed some 33,000,000 tons of proved and probable ore consisting of low grade siliceous magnetite carrying in its natural state about 35% of iron. For a number of years it was attempted to work the Moose Mountain ore by a process of magnetic separation and sintering, but in spite of the exceptional high-grade of the finished product it was found impossible to bring costs down to the point where a profit could be made in competition with available natural ores. Consequently, the attempt was abandoned and the large and costly plant dismantled.

General Situation, Market Conditions, etc.:

In spite of the fact that three Canadian provinces, British Columbia, Ontario and Quebec, offer bounties on the production of pig iron from local ores, no Canadian ore is being used in Canadian furnaces and there seems little likelihood that any will be until available foreign ores reach a considerably higher price than they command at present. The price schedule for Lake Superior iron ores is now \$1.30 per ton lower than it was in 1924 or \$4.40 for old range non-Bessemer ore. Meanwhile, prospecting and development of iron ore deposits in Canada is at a complete standstill.

LEAD IN 1928Production:

The production of lead in Canada in 1928 was by far the largest on record, amounting to 167,415 tons valued at \$15,474,003 as against 155,712 tons valued at \$16,477,139 in 1927.

Exports:

Lead in ores, etc.....	14,962,900 lbs. valued at \$	893,709
Lead in pigs & refined		
lead .....	<u>255,121,700</u> " " "	<u>10,172,075</u>
	270,384,600 " " "	\$11,065,784

Imports:

Lead in pigs and blocks, bars, sheets, etc. valued at \$1,227,632.

Ores Mined and Producing-Localities:

Much the greater part of the lead produced in Canada comes from the refinery at Tadanac, B.C., which treats lead concentrates from the Sullivan lead-zinc mine at Kimberley. The output of this mine far exceeds that of all other Canadian lead mines put together. There is also a considerable production from numerous silver-lead and silver-lead-zinc mines in the Kootenay districts and other parts of British Columbia. The Yukon output is silver-lead ore from the Mayo district; that of Ontario is derived from galena at the Galetta mine in Carleton county; and Quebec's output is lead concentrates from the Notre-Dame-des-Anges lead-zinc mine.

Important Developments and Prospective Producing-Localities:

The Consolidated Mining and Smelting Co. have enlarged their electrolytic lead refinery at Trail, B.C. to 400 tons per day. They have also converted the concentrating plant at Trail into a custom mill. They are now able to treat the whole output of their Sullivan mine at the Kimberley concentrator, the capacity of which is being increased from 4,000 tons to 6,000 tons per day, as well as all custom ores offering, and no longer find it necessary to sell any part of their output as lead concentrates or bullion. At Notre-Dame-des-Anges, in Quebec, the British Metals Corporation have made improvements both in their mine and mill, which have resulted in increased output. The Kingdon Mining, Smelting and Manufacturing Co. at Galetta, Ont., also increased their output during the year. The British Metals (Canada) Corporation have under development the Stirling lead-zinc property in Cape Breton, N.S.

Development work was carried on by the Federal Lead and Zinc Co. on their property in Gaspé peninsula, Que. Some work is also being done on a number of other lead prospects in eastern Canada.

General Situation, Market Conditions, etc.:

The average price of lead at Montreal in 1928 was 6.06 cents per pound as against 6.73 cents in 1927 and 8.15 cents in 1926. Despite the drop in price the year ended with the market in a healthy condition.

A.B. February 1929.

MOLYBDENUM IN 1928

Production: Nil.

Exports: Nil.

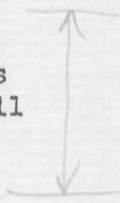
Imports: Nil.

Ores Mined and Producing-Localities:

Molybdenite is the only ore of molybdenum found in Canada. The Mess mine at Quyon, Que., which during the war produced 80 per cent of the Canadian molybdenite did not produce during the year and dismantled part of their concentrator in 1927.

Important Developments and Prospective Producing-Localities:

The Molybdenite Reduction Co.Ltd., have further prospected their property in the Abitibi district, south of Amos, Que. Their main shaft has been sunk to 150 feet, from which level a crosscut has intersected veins all of which are being drifted upon. A complete flotation concentrator is now being erected and production is expected early in 1929.



General Situation and Market Conditions:

During the past year the consumption of molybdenum has slightly increased, but there is little new in the way of application. That is, the business is slowly increasing in the line of ordinary structural alloy steels in which molybdenum is a constituent, particularly in the automobile industry. It has not made any progress when used in high percentages, as for example in high speed steels. About 5 per cent of this metal now finds its way into industry as oxides used in electricity, chemical reagents and as a mordant in dye works. All told the molybdenum consumption in the United States during 1928, amounted to probably over 600 tons. About 85 per cent of the present world's production of ore comes from the United States from two producers of which the Climax Company in Colorado is by far the largest. About 10 per cent comes from Norway. As an addition agent in the manufacture of the steels, the use of calcium molybdate continues to increase over ferro-molybdenum.

At the present new low prices, molybdenum steel can be sold for about \$1.50 per ton less than chrome-nickel steel.

NICKEL IN 1928Production:

In 1928 Canada produced 48,378 tons of nickel valued at \$22,318,907, as against 33,399 tons valued at \$15,262,171 in 1927.

Exports:

	<u>Quantity</u>	<u>Value</u>
Nickel in ore,matte,or speiss..cwt.	363,708	\$5,457,222
Fine nickel .....	511,887	13,320,034
Nickel oxides .....	96,072	3,004,951
	<u>971,667</u>	<u>\$21,782,207</u>

Imports:

Nickel in bars, rods, sheets,etc. valued at \$3,348,597.

Ores Mined and Producing-Localities:

The nickel produced in Canada comes almost entirely from the huge deposits of nickel-bearing pyrrhotite-chalcopryrite ores found in the Sudbury district in Ontario. The average content of the ores of the district is about 3 per cent nickel and 2 per cent copper though the proportions vary from mine to mine. At the Creighton, owned by the International Nickel Company and the richest now being worked, the nickel content is about 5 per cent; while in the lower levels of the Frood deposit which is in part owned by the International Nickel Co. and in part by the Mond Nickel Co. diamond-drill holes have cut ore carrying about the average nickel content but running as high as 20 per cent in copper.

In addition to that obtained at Sudbury a small amount of nickel is also obtained as a by-product of the working of the silver-cobalt-nickel ores of the Cobalt district.

Important Developments and Prospective Producing-Localities:

Developments that will have far-reaching effects are now underway at the Frood mine where both the International and the Mond Companies, who divide the ownership of the deposit between them, have sunk deep shafts and are now driving cross-cuts to open up the rich copper ore bodies. In order to take care of the production of the Frood the International Nickel Company are building a new smelter of some 3,000 tons daily capacity and a concentrator of 4,500 tons capacity. This is in addition to the present 2,000 ton smelter. The Mond Company had also announced their intention of making large additions to their plant for the handling of their portion of the Frood ore, but had not yet started actual construction, when a consolidation of the two companies was effected, which by eliminating the necessity for duplication of effort, will probably cause some modification of previous plans. The consolidated company, known as the International Nickel Company of Canada, will control 85 per cent or more of the world's nickel.

A new company, Falconbridge Mines Ltd., has been formed to exploit nickel-copper deposits found ten or twelve years ago by diamond-drilling heavily drift-covered areas in Falconbridge township, also in the Sudbury district. A shaft has been sunk to a depth of 230 feet and cross-cutting is underway to develop the mineralized zone which is said to be some 7,500 feet in length.

Rumors have been current of the discovery of large deposits of rich copper-nickel ore in northern Saskatchewan which are now said to be under option to the Consolidated Mining and Smelting Co. Authoritative statements, however, are still lacking.

General Situation, Market Conditions, etc.:

The use of nickel continues to show the same marked expansion characteristic of the last two or three years. Production increased steadily during the year. Prices throughout the year were unchanged ingot 35 cents, shot 36 cents, and electrolytic 37 cents per pound.

PLATINUM GROUP OF METALS IN 1928

Production:

The metals of the platinum group produced from Canadian ores in 1928 were valued at \$1,309,923 and consisted of:— platinum, 10,452 ounces valued at \$704,360, and palladium, rhodium, etc., 13,087 ounces valued at \$605,563.

Exports:

The exports in 1928 were:— platinum contained in concentrates 1,212 ounces valued at \$77,908, and platinum, old and scrap, 421 ounces valued at \$27,463. These figures do not include the precious metals contained in the copper-nickel matte exported.

Imports:

The imports in 1928 were valued at \$150,616 and consisted of platinum retorts, crucibles, wire, etc.

Ores Mined and Producing-Localities:

With the exception of a very few ounces of platinum obtained from the black sands of British Columbia, all the Canadian platinum and allied metals are obtained from the treatment of the Sudbury nickel-copper matte. The precious metal residues are allowed to accumulate over irregular periods before being treated, so that recoveries do not bear any definite relation to the quantity of matte treated in any particular year.

Important Developments and Prospective Producing-Localities:

The successful development of the Froid and Froid Extension copper-nickel mines near Sudbury, will add considerably to the Canadian production of metals of the platinum group, as the ores of these mines are reported to contain high values in these metals, as well as high gold and silver values.

General Situation, Market Conditions, etc.:

Canada ranks third in importance, as a source of metals of the platinum group, after Russia and Columbia. The recent discoveries of platinum in the Transvaal are of great importance and although only about 5,000 ounces were produced in 1926, double this amount was produced in 1927. The production of Columbia is estimated at 60,000 ounces and that of Russia possible a little higher.

Refined platinum, which began the year at \$80 an ounce, was settled at \$78 from March to October, while for the last two months of the year the price was about \$76 an ounce.

The drop in the price of platinum metal appears to be due to the failure of the English-American interests to come to an understanding with the Russian-Platinum Trust and it seems probable that the price will sustain a further decline, considering the claim in some quarters that the Russian production of the metal would still be profitable at a price of about \$40 per ounce.

A.B. February 1929.

SILVER IN 1928Production:

The silver produced in Canada in 1928 amounted to 21,922,795 ounces valued at \$12,753,806, as compared with 22,736,698 ounces, valued at \$12,816,577 in 1927.

<u>Exports:</u>	<u>Quantity</u>	<u>Value</u>
	ozs.	\$
Silver in ore, concentrates, etc.	6,815,691	3,824,385
Silver bullion	14,592,406	8,456,968

Imports:

Unmanufactured silver bullion	984,547
Sterling and other silver	350,567
Silver coin	---

Ores Mined and Producing-Localities:

In Ontario, production is at present mainly obtained from the silver-cobalt-nickel ores of Cobalt, South Lorrain and Gowganda; in British Columbia from the native silver and argentiferous galena of the Premier and other Portland Canal mines, as well as from the silver-lead-zinc ores of the Kootenays and other parts of the province. About 25 per cent of the year's output of silver from the Dominion came from the Consolidated Mining and Smelting Co.'s Sullivan mine at Kimberley, B.C. In the Yukon Territory, Mayo is the productive locality, the output being a rich silver-lead ore.

Important Developments and Prospective Producing-Localities:

In British Columbia there has been increased activity amongst the silver-lead-zinc mines, particularly in the Kootenays, where the high grade of the ore has been well maintained and additional producers may be expected. Considerable quantities of silver should, in the near future, be won as a by-product of the large and growing enterprises, particularly the International Nickel mines at Sudbury, Ontario and the Noranda mines of the Rouyn district of western Quebec, while in a few years the proposed developments of the Flin Flon and Sherritt-Gordon mines of northern Manitoba should also add their substantial quota of silver.

General Situation, Market Conditions, etc.:

British Columbia continues to be the leading producer with approximately 10,570,000 ounces, an increase of 100,000 ounces over 1927, and further increase may be expected. In the Ontario silver camps, the South Lorrain production was only about half that of 1927 and there was also about 20 per cent decrease from the Cobalt area. The Gowganda production is now greater than that of Lorrain, though there was a slight decrease owing to the closing down of the third largest producer. Recent activities in Gowganda may, however, lead to an increase from this camp.

Although the average price of silver (58.18 cents) was slightly better than in 1927 (56.37 cents) it is still low enough to have an adverse effect on profits, which has been felt most severely by the operators whose existence depends on their output of this metal. The events in China will, as in the past, dominate the silver market and the expected continued success in the new regime of this country should maintain their requirements on a large scale resulting possibly in a slight advance in the price of the white metal.

TITANIUM IN 1928

Production:

In 1928, 2,244 tons of ilmenite valued at \$6,732 were shipped from Quebec to Niagara Falls, N.Y., and Lynn, Mass.

Exports:

As above stated.

Imports:

Not separately recorded.

Ores Mined and Producing Localities:

Ilmenite, carrying from 18 to 25 per cent titanium, occurs in large bodies at Ivry in Terrebonne county, and at St. Urbain in Charlevoix county, Quebec, and occasionally small quantities are mined and shipped from these places for export to the United States. Small shipments have also been made to England for experimental purposes. Most of that exported to the United States has been used for the manufacture of ferro-titanium at Niagara Falls, N.Y. Ilmenite shipped from the General Electric Company's mine at St. Urbain has gone to the same company's works at Lynn, Mass., and, as it is rutile-bearing, it is presumably for its rutile content that it has been mined. The General Electric Company's deposit at St. Urbain is the only known deposit of rutile of commercial grade in Canada.

Important Developments and Prospective Producing Localities:

None.

General Situation, Market Conditions, etc.:

The chief uses of titanium are in the manufacture of paint pigments, ferro-alloys, etc., the first of which is the most rapidly expanding use and is now probably the most important also. Control of the world's titanium pigment industry at present appears to be almost entirely in the hands of the National Lead Company of New York, which owns a 75 per cent interest in Titanium Pigment Co. Inc. operating in the United States, and is recently reported to have purchased control of the Titan Company of Norway and of the Société Industriale de Titane of France, and also to have concluded agreements to manufacture and sell titanium pigments in Germany and other European countries.

Canada has at present no titanium industry but a Canadian company, Titanium Ltd. has secured control of the Ivry ilmenite deposits for the purpose of utilizing them in the manufacture of titanium-white. In the early part of 1928 the erection of a pilot plant in the vicinity of Montreal was contemplated, but recent reports would indicate that these plans have been changed, and that it is now proposed to build the plant in the United States, where access would be had to a larger market, and to ship the ilmenite from Ivry there for treatment.

The published price quotations for ilmenite are nominal so far as Canadian producers are concerned as there is no general demand and practically all the larger users control their own sources of supply.

ZINC IN 1928Production:

The production of zinc in Canada in 1928 amounted to 93,306 tons valued at \$10,250,589 as against 82,748 tons valued at \$10,250,793 in 1927.

Exports:

	<u>Tons</u>	<u>Value</u>
Zinc ore (zinc content of).....	11,255	\$1,438,619
Metallic zinc .....	63,594	6,602,867
Zinc scrap, dross and ashes.....	<u>3,472</u>	<u>203,884</u>
Total.....		<u>\$8,245,370</u>

Imports:

	<u>Lbs.</u>	
Spelter .....	1,845,258	\$107,920
Zinc sheets & plates, blocks, etc...	9,299,015	687,293
Other imports .....	<u>          </u>	<u>\$1,479,969</u>
Total.....		<u>\$2,275,182</u>

Ores Mined and Producing Localities:

Almost all the zinc produced in Canada comes from the Consolidated Mining and Smelting Co.'s plant at Trail, which secures its ore, in the form of concentrates, from the Company's Sullivan mine at Kimberley, and, to a smaller extent, from the independent mines in the Kootenay district, British Columbia. Zinc concentrates are also produced at Notre-Dame-des-Anges in Quebec, and at the Errington mine, near Sudbury, Ontario.

Important Developments and Prospective Producing Localities:

The Consolidated Mining and Smelting Company's plant at Trail, B.C., made a further increase in production in 1928 and further expansion is under way, bringing the capacity of the smelter up to 375 tons of zinc per day. There was also a large increase in the quantity of zinc concentrates exported from Notre-Dame-des-Anges in Quebec by British Metals Corporation, Ltd.

Developments at the Flin Flon, Sherritt-Gordon, and Mandy deposits in Northern Manitoba, and in the vicinity of Chelmsford in the Sudbury district, Ontario, make it altogether likely that both Manitoba and Ontario will, in a few years time, become important zinc-producing provinces. Quebec's output of zinc will be materially increased at some time in the future by the recovery of zinc from the mixed copper-zinc ores that are believed to exist in large quantities in the Rouyn district.

Exploratory operations were carried on during the year on the lead-zinc deposits of Gaspé, Quebec, by various parties, but there was no actual production. Exploration of the Stirling deposits in Cape Breton, N.S., also, was pushed ahead vigorously during the year by the British Metals Corporation, Ltd.

Announcement has just been made of the proposed construction of zinc refineries in eastern Canada by the Consolidated Mining and Smelting Co. and by the Noranda Mines Ltd., which plants will permit such properties as the Flin Flon, Sherritt-Gordon, Errington, Waite, Amulet, Abana and others to market their zinc concentrates at a profit.

General Situation, Market Conditions, etc.:

The average price of zinc at Montreal for 1928 was 7.14 cents per pound as against 7.71 cents in 1927, and the demand was good throughout the year. It has been estimated that the world's production of zinc for 1928 will approximate 1,390,000 metric tons as against 1,329,000 tons in 1927. With various new plants operating, approaching completion, and planned, we must expect a further increase in production for 1929. The production at the present time is a little below the consumption. If the world situation can be regulated and established on such a footing that production is strictly limited to consumption, a higher and more steady price might be maintained, which should benefit the majority of the producers.

ARSENIC IN 1928Production:

The production of arsenic, estimated as white arsenic,  $As_2O_3$ , in Canada in 1928 was 2,708 tons valued at \$192,712, as against 3,114 tons valued at \$211,968 in 1927.

Exports:

The exports for 1928 were 1,597 tons valued at \$122,106 as against 1,928 tons valued at \$124,823 in 1927.

Imports:

White arsenic .....	333,113	lbs.	valued at	\$13,976
Arsenic, sulphide of.....	94,380	"	"	5,566
Soda, arseniate, bi-arseniate and stannate of.....	360	"	"	83
	<u>427,853</u>	"	"	<u>\$19,625</u>

Ores Mined and Producing Localities:

All the white arsenic produced in Canada is made by the Deloro Smelting and Refining Co. Ltd., at Deloro, Ont. from arsenical silver-cobalt-nickel ores from Cobalt and surrounding districts in northern Ontario. There is also a certain amount of recoverable arsenic contained in silver-cobalt residues exported for treatment to European smelters. The Nickel Plate gold mine at Hedley, B.C. exports arsenical gold concentrates to the American Smelting and Refining Co.'s smelter at Tacoma, Washington for the recovery of gold and arsenic and occasional shipments of arsenical concentrates have also been made by gold mines in Nova Scotia to European treatment plants.

Important Developments and Prospective Producing Localities:

Deposits of mispickel, in places associated with more or less gold, are known at a number of localities in Nova Scotia, Ontario, and British Columbia, but at present prices the arsenic content of these is no inducement to attempt their exploitation.

The General Situation, Market Conditions, etc.:

Arsenic is usually recovered in the form of white arsenic ( $As_2O_3$ ) in America, chiefly as a by-product in the smelting and refining of other ores and metals. Its chief use is in the manufacture of insecticides, weed-killers, glass, and cattle dips. Arsenic compounds are also used to some extent as pigments for various purposes; as antiseptics and preservatives; as medicines; and for other minor purposes.

The price of white arsenic remained steady throughout the year at 4 cents per pound, a price that is believed to be very little, if any, above the average cost of production. To meet commercial requirements it must be white in colour and contain not less than 99 per cent  $As_2O_3$ . It should have about the fineness of flour and not be lumpy. As supplied in carload lots to insecticide manufacturers, etc. it is usually packed in barrels containing about 550 pounds each; for the retail trade it is put up in packages of from one to ten pounds weight.

A.H.A.R. February 1929.

## ASBESTOS IN 1928

### Production:

The total shipments of asbestos of all grades in 1928 amounted to 273,033 tons, valued at \$11,238,360, compared with 274,778 tons, valued at \$10,621,013 in 1927, and 279,403 tons, valued at \$10,099,423 in 1926. The tonnage figures were slightly lower than in 1927, while the value is higher.

### Exports:

	Tons	Value
Asbestos - - - - -	129,192	\$8,802,558
Asbestos sand and waste - - -	135,729	2,177,729
Manufactures of asbestos - - -	-- --	65,895
		<u>\$11,046,182</u>

### Imports:

Asbestos packing - - - - -	101	\$ 108,044
Asbestos in any form other than crude - - - - -		727,843
		<u>\$ 835,887</u>

### Ores Mined and Producing Localities:

Canadian asbestos, which is of the chrysotile or serpentine variety, is practically all obtained from the Eastern Townships, Quebec.

### Important Developments and Prospective Producing Localities:

Attempts to develop prospects in other parts of Quebec and in Ontario have not been successful owing to the small size of the veins encountered in development work.

Several inactive properties between Thetford Mines and East Broughton have been acquired by two of the larger companies so that practically all the known asbestos bearing ground from Black Lake to East Broughton is now held by four companies.

One new mill has been erected at Thetford. Production from a high grade area now under development should serve to augment the supply of long fibre from Canada in 1929.

### General Situation, Market Conditions, etc.:

The demand for Canadian fibre in the longer grades, No.1 Crude, No.2 Crude and spinning fibres was greater than the producers could meet. Manufacturers were therefore forced to supplement with African and Russian fibres for textile purposes. Prices were erratic and practically no stock was carried on hand at the factories. Lower grades were produced and used to a slightly greater extent than in the previous year. The higher average price was due to the increased selling prices for long fibre.

With the exception of one company which had recently overhauled its quarrying and milling equipment the year was not a profitable one to the producers.

Increased costs prevailed at some open pits on account of the effect of unfavourable weather conditions. Working ground which contained only a low percentage of fibre, and that such as would mill out, principally short fibre stocks, was responsible for decreased earnings.

Experiments conducted to determine whether asbestos waste might have a value as a soil improver indicate that for such purpose the material is valueless. Extensive research in an attempt to manufacture various articles from the material in the waste dumps has so far not developed any product of economic value.

South African fibre is becoming a more serious competitor, and in the manufacture of certain articles has displaced Canadian. Higher prices for long fibre have also stimulated the search for additional deposits in the United States, so that increased competition from that source may follow.

BARYTES IN 1928Production:

The production of barytes in 1928 was 127 tons valued at \$2,847, as compared with 56 tons, valued at \$1,268 in 1927. The value as reported refers to the products after grinding.

Exports:

Not separately classified in trade records, but probably nil.

Imports:

Imports of ground barytes in 1928 totalled 2,878 tons, valued at \$58,710, compared with 2,841 tons, valued at \$58,504 in 1927.

Imports into Canada were as follows:

	<u>Tons</u>	<u>\$</u>
From Great Britain .....	108	2,336
" United States .....	1,330	31,750
" Germany .....	1,385	23,842
" Netherlands .....	55	782

Ores Mined and Producing-Localities:

As in 1927, production was confined to a single deposit at Lake Ainsley, Nova Scotia, worked by a Halifax paint firm to supply its own requirements.

Important Developments and Prospective Producing-Localities:

Announcement was made during the year of the formation of a company, Canada Night Hawk Mines, Ltd., to re-open the old Premier-Langmuir mine on Night Hawk river, northern Ontario, and diamond-drilling of the deposit was conducted and is reported to have given encouraging results. There have been no developments in connection with other known barytes deposits of northern Ontario or with those of the Spillamacheen region, British Columbia. An interest is reported to have been taken by Sudbury Basin Mines in the Cryderman property near Tionaga, northern Ontario, and in the Jarvis island deposits, near Port Arthur.

General Situation, Market Conditions, etc.:

Canada imports most of her barytes requirements from the United States, the product being chiefly ground Missouri barytes.

Prices have remained fairly steady during the year. The tariff of \$7.50 per ton on ground barytes, and \$4.00 per ton on crude, entering the United States is considered too low by American producers and is a matter of some concern to the operators, who are faced with the prospect of increasing imports of European barytes, particularly crude, as well as of barium compounds. The duties levied are, however, sufficient to effectually shut out Canadian barytes, both crude and ground, and there seems little immediate hope for any successful development of our known resources of high-grade barytes. There should, however, be opportunity for the manufacture in Canada of lithopone, large quantities of which are consumed by the paint, rubber and oil cloth trades, and of which there is no present domestic production. About two-thirds of the American production of crude barytes ore is employed in lithopone manufacture.

During the year, the United States raised the duty on barium carbonate imports from 1 cent to 1½ cents per pound.

BITUMINOUS SAND IN 1928Production:

There is no established commercial production of bituminous sand in Canada as yet. Prior to 1927, approximately 2,000 tons had been shipped for use in connection with laboratory investigations and demonstration purposes. During 1927 further shipments aggregating upwards of 3,000 tons were used for demonstration purposes at Edmonton and at Jasper, Alberta, chiefly for surfacing roads and walks.

Exports:

It is altogether unlikely that export of bituminous sand, or various hydrocarbons which may be derived therefrom, will be possible for some years.

Producing Localities:

The deposit of bituminous sand extends along the Athabaska river and certain of its tributaries between the 23rd and 26th base lines in the Province of Alberta. Occasional shipments of bituminous sand, largely for demonstration purposes, have been made from Sec. 32, Tp. 88, R. 8; Sec. 14, Tp. 89, R. 9; Sec. 8, Tp. 89, R. 9 and Sec. 24, Tp. 95, R. 11.

Important Developments and Prospective Producing-Localities:

Up to the present time, principal activity has been directed toward field exploration, demonstration work, and laboratory studies. Results of investigations by the Department of Mines will be found in:

Report No. 632, "Bituminous Sands of Northern Alberta," by S. C. Ellis (1926).

Report No. 684, "Use of Alberta Bituminous Sands for Surfacing of Highways," by S. C. Ellis (1927).

A report No. 694 on recent paving operations carried out at Jasper, Alberta, in 1927, is now in press.

Laboratory and demonstration work by Department of Mines has included:

(a) Analyses of representative samples of bituminous sand and of separate bitumen.

(b) Investigation of distillation and separation methods designed for recovery of hydrocarbons, and work on sulphur compounds in the different fractions.

(c) Development and demonstration of a drilling system suitable for core drilling through bituminous sand.

General Situation and Market Conditions:

Until production and transportation costs are determined, more definitely, it will be impossible to estimate the extent to which Alberta bituminous sand and various derived hydrocarbons may ultimately displace imported materials of a similar class.

CHROMITE IN 1928

Production:

No production of chromite was reported in 1928, or in the preceding year. In 1923, 3,558 tons of 48 per cent Cr<sub>2</sub>O<sub>3</sub> concentrates, valued at \$52,650 was produced.

Exports:

There were no exports of chromite in 1928.

Imports:

The imports of chrome ore are not separately recorded. During 1928, the following were imported: bichromate of soda 2,091,214 lbs., valued at \$122,378; bichromate of potash 193,940 lbs., valued at \$17,155; chrome steel 4,434 tons valued at \$264,659; chrome firebrick valued at \$56,375.

Ores Mined and Producing Localities:

The principal chromite mines are situated in the Coleraine district, Quebec, and are regarded as capable of producing large quantities of ore.

Important Developments and Prospective Producing Localities:

During the year, a discovery of chromite was reported near Collins station, on the Canadian National railway, about 120 miles east of Sioux Lookout, but no further details are as yet available.

General Situation, Market Conditions, etc.:

Economic considerations, the chief of which is the competition of cheaply produced higher-grade ore in foreign countries, have reduced war-time production, (36,725 tons, valued at \$499,682 in 1917), to nil, notwithstanding the fact that the world consumption of chromite has nearly doubled since 1914. This increased consumption is due to the development of high-grade alloy steels and the growing use of chromite refractories.

Over half of the world's supply of chromite is now derived from Rhodesia, which produced about 220,000 tons in 1928. The remainder is obtained chiefly from New Caledonia, Cuba, Greece, Russia and the Transvaal.

CORUNDUM IN 1928Production:

There was no production in 1928. No corundum has been produced since 1921, when shipments amounted to 403 tons of graded grain valued at \$55,965.

Exports:

There were no exports of corundum in 1928.

Imports:

Nil.

Ores Mined and Producing-Localities:

Nil.

Important Developments and Prospective Producing-Localities:

Corundum is found near Craigmont, Ontario, and several mines have been operated in the past.

General Situation, Market Conditions, etc.:

The competition from artificial abrasives has been the main cause of the decline in production. During the last few years, however, natural corundum has been used for the manufacture of the artificial abrasive, oxide of aluminium, the corundum for which is at present obtained from South Africa. In the current year, however, there was a marked decline in this use for which the consumption was less than 15 per cent. The mineral is mainly utilized in the manufacture of grinding wheels (60%) and for lens and optical glass polishing (25%).

The imports of South African corundum into the United States in 1928 amounted to about 2,000 tons as against 1,064 tons in 1927, and 5,000 tons in 1926.

## DIATOMITE IN 1928.

### Production:

The production of diatomite (also called diatomaceous earth, tripolite, infusorial earth, kieselguhr), in 1928 amounted to 433 tons, valued at \$10,825, against 266 tons in 1927 valued at \$6,650.

### Exports:

None recorded, but all the eastern material produced was exported to the United States for final treatment.

### Imports:

268 tons valued at \$9,594.

### Producing Localities:

Diatomite is mined by the Oxford Tripoli Company, who own several deposits in northwestern Nova Scotia. Their old deposit at Silica Lake was abandoned in 1926 and during the year all their material was obtained from ponds at New Annan, north of Tatamagouche, where a drying and calcining plant was erected. The raw calcined product is shipped to the company's refinery, at Haverstraw New York, U.S.A. A few car lots were also mined by the B.C. Refractories, Ltd. deposits near Quesnel, B.C. and treated in Vancouver for use as a concrete admixture.

### Important Developments and Prospective Producing-Localities:

Although there are upwards of a hundred occurrences of diatomite in the Maritime provinces, where the material occurs in the bottoms of ancient or existent lakes, there are only a few of sufficient size to be worked commercially. The most important of these are in the Cobequid mountains, and Digby Neck in Nova Scotia and Pollet Lake, southeastern New Brunswick.

The largest deposit in the Dominion at present known, is in the vicinity of Quesnel in Central British Columbia, where material of pur grade occurs in beds 40 feet thick that extend over a large area.

During the year the Scotia Diatom Products Co. continued to drain their Digby Neck, N.S. deposit and to construct a treatment plant. No shipments were made other than a very small amount for experimental purposes. This concern, however, ceased operations during the latter part of the year and negotiations for an amalgamation with the Oxford Tripoli Co. are now underway. During the latter part of the year a new concern, the Ontario Diatomite & Silica Co. acquired several deposits in Muskoka and propose to erect a treatment plant with the object of producing by the summer of 1929

### General Situation, Market Conditions, etc.:

Diatomite has numerous uses, which are mainly divided into filter medium, insulators against heat, cold and sound; for abrasive purposes such as metal polishes and powders, and in fillers for paint, rubber, etc. Recently it has been successfully employed as an ingredient in the manufacture of concrete for which probably 700 tons were used in 1928. Another growing use is its application in the manufacture of battery boxes. Although the annual production in Canada is small, nevertheless, there has been a marked increase in activity and there has also been both an increase in demand and in its variety of uses.

Most of the material used in Canada comes from the United States which now produces over 100,000 tons annually. Eighty per cent of this is produced by one firm the Celite Products Co., Los Angeles, Cal., which during the latter part of the year merged with the Johns-Manville Co. of New York.

The present price in Canada varies from \$55 to \$200 per ton according to grade and ultimate use.

## FELDSPAR IN 1928

### Production:

Feldspar production in 1928 totalled 32,265 tons, valued at \$287,398 as compared with 29,849 tons, valued at \$259,151 in 1927.

### Exports:

Exports of crude feldspar in 1928 were 28,101 tons, valued at \$230,945 as against 28,648 tons, valued at \$225,955 in 1927. The bulk of the exports was consigned, as in previous years, to grinding plants in the United States. Crude spar enters the United States duty free, while ground spar is taxed 30 per cent ad valorem.

### Imports:

Imports of ground feldspar in 1928 totalled 3,171 tons valued at \$53,818, as compared with 3,040 tons, valued at \$50,875 in 1927.

### Ores Mined and Producing Localities:

All of the feldspar mined in Canada is of the potash variety known as orthoclase or microcline. Soda feldspar (albite) is known to occur, but there is little demand for this variety and none is mined.

The principal producing localities in 1928 were the Hybla, Porth, and Verona areas, in Ontario, and the Buckingham area in Quebec. The last named came to the fore in 1921, when development work proved up several bodies of exceptionally good feldspar and resulted in a production of 10,000 tons from one quarry alone in that year. Previous to 1921, Ontario furnished practically the entire production. Selected feldspar from Buckingham is in high demand for dental purposes.

The Richardson mine, near Verona, Ont., formerly an important producer but idle for many years, was reopened during 1928.

### Important Developments and Prospective Producing Localities:

Nothing to report.

### General Situation, Market Conditions, etc.:

Production of feldspar in 1928 was greater by more than 2,400 tons than in the previous year, but was 12,539 tons lower than the 1924 figure which was the highest, both in tonnage and value, in the history of the industry. Exports decreased 547 tons from 1927.

The grinding plant at Toronto owned by Industrial Minerals Corporation was not operated during the year and the mill of the Frontenac Floor & Wall Tile Company, at Kingston, supplied the only domestic production of ground feldspar; the capacity of the latter plant was doubled during 1928 by the installation of a second grinding unit.

Establishment of additional grinding plants in the United States has resulted in over-capacity, and consequent competition has brought about progressively lower prices for ground spar. While not absolutely dependent on Canadian feldspar, United States grinders find in Canada an important source of high-grade spar, and about 12 per cent of the total consumption of crude spar in Canadian.

The establishment of a glass plant at Oshawa, designed to manufacture glass from feldspar, is reported. This plant is not yet in operation, but it is stated that large quantities of feldspar will be used.

The price level for crude Canadian feldspar in 1928 remained at around \$8.50 for the best grade, f.o.b. cars.

FLUORSPAR IN 1928

Production:

Fluorspar production in 1928 and 1927 was nil, compared with 3,886 tons worth \$19,234 (\$4.97 per ton), in 1925.

Exports:

There were no exports of fluorspar in 1927 or 1928.

Imports:

Imports of fluorspar in 1928 amounted to 14,362 tons, valued at \$153,046 an increase of 9,801 tons in quantity and \$94,345 in value from 1927. In addition, Customs records showed a small importation of hydro-fluosilicic acid of 6 tons valued at \$1,646.

Cres Mined and Producing-Localities:

Canadian fluorspar occurs both as lump and gravel spar. The deposits vary in the type of mineral they carry; at some mines, the fluorspar occurs in a massive crystalline form, and can be cobbled of impurities; in others, the spar is in the form of a loose sand or gravel.

Important Developments and Prospective Producing-Localities:

Consequent on an active demand for fluorspar during the war, a number of mines were opened up in the Madoc district, Ontario. A few of these developed into important producers, but most of them remained small prospects.

Development of a large vein of fluorspar was undertaken several years ago near Grand Forks, B. C., by the Consolidated Mining and Smelting Company. The ore contained silica, and it was necessary to erect a concentrator to make a marketable product. Due to slackened demand, the mine was not actively operated for several years; it was, however, re-opened in 1925, and accounted for most of the Canadian production during that year.

General Situation, Market Conditions, etc.:

The eastern deposits of fluorspar are relatively small and expensive to work, and operators find it difficult to compete with foreign supplies. Export to the United States was discouraged by the 1922 tariff, which imposed a duty of \$5 a ton on fluorite; this duty was increased during 1928 to \$8.40 per long ton. In the United States market, also, Canadian fluorite can hardly meet the competition of cheap European and South African mineral.

Gravel fluorspar, not less than 85 per cent  $\text{CaF}_2$  and not over 5 per cent  $\text{SiO}_2$  was quoted at \$18 per ton, f.o.b. American mines at the end of the year, an increase of \$2 from the January level.

Increasing imports of cheap, foreign fluorspar have rendered it more and more difficult for American producers to operate profitably, and the 50 per cent increase in the tariff is aimed chiefly at English gravel spar, running not over 93 per cent calcium fluoride.

GARNET IN 1928Production:

Garnet was first produced in 1923 when 1,250 tons valued at \$100,000 were shipped. There was no production since.

Exports:

Nil.

Imports:

Not separately recorded but probably about 100 tons.

Ores Mines and Producing Localities:

Practically the whole of the Canadian abrasive garnet output up to the present has been obtained from the deposit of the Bancroft Mines Syndicate, situated some 18 miles east of Bancroft, Ontario.

Important Developments and Producing-Localities:

A considerable amount of development work has been carried out on a garnet deposit of excellent grade at Labelle, Que., 100 miles north of Montreal by the Labelle Nickel and Garnet Co. of Montreal. A few camp buildings have been erected and plans for the erection of a small treatment plant are completed and they expect to be producing by the summer of 1929. Some prospecting work has also been carried out by the Montauban Exploration Syndicate (late Langlade Garnet Syndicate) at Langlade, Baudin township, Abitibi district, Quebec. Several parcels of ore have been sent out for concentration tests and the erection of a treatment plant is being considered.

General Situation and Market Conditions:

Ninety per cent of the world's production is used for making abrasive papers and cloths. Garnet paper has now largely taken the place of sand and emery papers, particularly in the wood-working industries, although during the year artificial abrasive coated papers have made inroads into the garnet paper production. Coated papers are manufactured in Canada by Abrasives Ltd., Brantford, Ontario, a subsidiary of the American Glue Company. The material received from American and Canadian mines is in the form of a semi-graded concentrate that brings from \$70 to \$85 per ton according to quality. The finer grades have recently been successfully employed in the glass grinding and bevelling industries.

The world's best garnet is at present obtained from mines in New York State the annual production of which two or three years ago was over 8,000 tons, but fell to about 6,000 tons in 1927. During the year under review the principal producer only operated for 6 months, while some others closed down so that there was a further reduction in output amounting to over 35 per cent. There is, however, still a fair demand for abrasive garnet, but it must be of the highest quality.

GRAPHITE IN 1928Production:

The production of graphite in 1928 totalled 1,096 tons, valued at \$57,041, as compared with 1,829 tons, valued at \$111,656 in 1927.

Exports:

In 1928, 1053 tons of graphite were exported, valued at \$45,384.

Imports:

Graphite imports, including crucibles, were valued at \$128,026.

Ores Mined and Producing-Localities:

Canadian graphite is marketed as refined flake, the product of concentration of disseminated ore. One mine formerly shipped a certain amount of rich crude ore. No lump crystalline graphite, (plumbago) is produced in Canada.

The mines and mills are situated in the Perth, Bancroft and Calabogie districts in Ontario, and in the Buckingham, Guenette, and St. Remi districts in Quebec. During 1928, the mill of the Black Donald mine at Calabogie, Ont., the only active operator in the Province, was burnt down, and the mine was idle all year. In Quebec, the only operator continued to be the Canadian Graphite Corporation, at Guenette.

Important Developments and Prospective Producing Localities:

A new shaft has been put down at the Black Donald mine and development has disclosed large reserves of graphite; a new mill is also in course of erection.

General Situation, Market Conditions, etc.:

The graphite market, which had been in a very depressed condition since 1918, strengthened considerably in 1925, due to the depletion of accumulated stocks of both graphite and crucibles. Madagascar production had fallen off considerably during 1923 and 1924, owing to the market being over-supplied, and as a result, consumers, in 1925, found themselves faced with a shortage of flake. This led to higher prices all round, which, in turn, aroused a degree of fresh interest in Canadian graphite deposits. However, prices are likely to be controlled very largely by Madagascar, which possesses great resources of cheaply-won flake graphite of excellent crucible grade; this graphite can be laid down in New York, and in Europe, at prices probably lower than the cost of extraction of American graphite. Any material increase in price of flake graphite, owing to depletion of stocks, will probably lead to increased production by Madagascar operators.

There was little change in the general graphite situation in 1928, as compared with the previous year.

No. 1 flake was quoted at around 8 cents per pound ex dock New York, at the close of the year.

All graphite crucibles used in Canada are imported from Great Britain or the United States. The crucible plant erected at St. Johns, Que., during the war was dismantled some years ago.

Due to the increasing use of electric furnaces for the melting of metals, the demand for graphite crucibles has fallen off markedly, and a number of American crucible makers have gone out of business or have turned to the making of refractories. Whereas ten years ago, about 75 per cent of the world's production of graphite was estimated to go into crucibles, it is now believed that less than 15 per cent is so employed.

GRINDSTONES AND PULPSTONES IN 1928.

Production:

The production in 1928 of grindstones, pulpstones, and scythestones was 2,233 tons, valued at \$123,391, as against 2,251 tons, valued at \$125,017 in 1927.

Exports:

The exports in 1928 amounted to \$28,747, as against \$50,866 in 1927.

Imports:

The imports (mostly pulpstones), in 1928 amounted to \$653,390, as against \$911,708 in 1927.

Producing Localities:

During 1928 there were only two producing companies in the Maritimes of which the largest is the Read Stone Company producing grindstones from their quarries at Stonehaven in northern New Brunswick and pulpstones from Dorchester in the south. Pulpstones were produced from the Miramichi Quarry Co.'s quarry at Quarryville, near Newcastle, N. B. The Nova Scotia grindstone production is now almost nothing, being less than 10 tons from the vicinity of New Glasgow.

During the early part of the year the J. A. McDonald Company, Vancouver, produced pulpstones from their quarry on Newcastle Island, near Nanaimo, Vancouver Island, B. C., but have been closed down since July.

Important Developments and Prospective Producing Localities:

There are in the Maritime provinces at least 60 or 70 quarries from which stones have been furnished, almost all of which are now idle because of present market conditions.

General Situation and Market Conditions:

The demand for all but the largest sized grindstones is very limited, owing to the increasing use of the artificial stones and to foreign competition. The price of Canadian natural grindstones is about \$40 per ton and about \$80 per ton for pulpstones.

There is a demand for good pulpstones and over half a million dollars worth are used annually in the 60 Canadian pulp mills. The 1926 Canadian pulpstone production was the highest on record, but only about 10 per cent of the stones used in Canadian mills are produced in Canada. There has, however, been a decrease in output since that year.

The stones for the modern pulp mills are now mainly of the large magazine type, which at the increased rate of speeds call for a more exacting and durable wheel than used in former years. Sandstone deposits containing beds of sufficient thickness (7 feet or over) and material of the requisite qualifications are becoming very scarce; moreover, the new artificial pulpstone made up of silicon carbide segments is gradually but surely replacing the natural stone.

GYPSUM IN 1928Production:

There were 1,205,846 tons, valued at \$3,622,007 produced in Canada in 1928, as compared with 1,039,562 tons, valued at \$3,214,356 in 1927.

Exports:

Exports of gypsum and gypsum products in 1928 were 832,768 tons valued at \$1,381,933 as against 595,364 tons, valued at \$1,072,907 in 1927.

Imports:

The imports of gypsum and plaster of Paris for 1928 were 11,977 tons, valued at \$190,241 as against 8,219 tons, valued at \$147,560 in 1927.

Ores Mined and Producing-Localities:

The materials produced in this industry are the hydrous calcium sulphate, commonly known as gypsum, and the partly anhydrous material known as plaster of Paris or wall plaster. It is marketed in the crude lump form, ground as land plaster and terra alba, or ground and calcined as plaster of Paris, and wall plaster. An increasing proportion of the calcined material each year enters into the manufacture of wall board, gypsum blocks, insulating material, etc.

Nova Scotia is the largest producer of gypsum in Canada followed by New Brunswick, Ontario, Manitoba and British Columbia.

Important Developments and Prospective Producing-Localities:

An important development in the gypsum industry has been the amalgamation of the Ontario Gypsum Co. with the Alabastine Co. of Paris, the Manitoba Gypsum Co. of Winnipeg and the B.C. Gypsum co., whereby these companies are combined under the name of the Canada Gypsum and Alabastine Co. Ltd., with head office at Paris, Ont. The new company now is the only company in Canada manufacturing gypsum wall board with mills in Montreal, Que., Caledonia, Ont. Lythmore, Ont., Winnipeg, Man., and Port Mann, B.C.

In Nova Scotia the deposits at Antigonish and Mabou have been temporarily closed down, arrangements having been made to obtain supplies elsewhere in the province. New work was also carried on at several other deposits with a view to operating them in the near future. In New Brunswick several of the known deposits have been recently examined to ascertain their possibilities.

The recently imposed duty of 30% ad valorem placed by the United States government on mechanically cracked gypsum entering the United States (approximately 50¢ per ton on present values) may tend for a time to act against the gypsum industry in the Maritime provinces.

Extensive deposits are known in Northern Ontario and (if the Timiskaming and Northern Ontario railway is completed to James Bay), these deposits may become producers. Interest is also being shown in the gypsum areas adjacent to the operating deposits south of Hamilton, Ont., but to date no new properties have been opened. The deposits in Alberta, although situated at a distance from markets and railway transportation are of good grade.

The General Situation in Respect to the Industries & Market Conditions

The use of gypsum in the building trade is making rapid strides. Originally gypsum was used as a fertilizer, and as a wall plaster, but its lightness, durability, fire-resisting, insulating and acoustic properties have been recognized more recently in the development of tiles, wallboards, blocks, and in special insulating and acoustic plasters. The continued activity in the building trade throughout the whole of Canada, finds reflection in the demand for gypsum building materials and in consequence the gypsum industry in Canada is showing excellent progress.

## IRON OXIDE MINERAL PIGMENTS IN 1928

### Production:

The production of iron oxides in 1928 was 5,395 tons, valued at \$110,338, as against 6,125 tons, valued at \$103,536 in 1927.

### Exports:

Iron oxides, ochres, etc., 1,124 tons, valued at \$44,342.

### Imports:

Ochrey earths, oxides, etc., 6,764 tons, valued at \$821,290.

### Ores Mined and Producing Localities:

Material produced under this heading includes:- ochreous iron oxide sold uncalcined for the purification of illuminating gas; ochreous iron oxide, calcined, called metallic oxide, used in the manufacture of paint; umber, uncalcined and calcined; and sienna, calcined and uncalcined.

The major part of the production is from the vicinity of Three Rivers, Quebec. Production has also been reported in recent years from Lynch township, Labelle county; Ste. Anne de Beaupre; and Iberville township, Saguenay county; all in the province of Quebec. Some production has been reported from British Columbia since 1923.

### Important Developments and Prospective Producing Localities:

There have been no outstanding developments in the mineral pigment industry during the year 1928 and the production figure has remained practically constant for several years past.

The present producing locality has met the domestic requirements of the pigment trade for many years past and although, undoubtedly, there are other prospective producing localities, particularly in the low lying ground bordering the lower St. Lawrence Gulf, no special effort has been made to locate them.

### General Situation, Market Conditions, etc.:

The demand within the country for these products is fair. Most of the higher grade oxides, ochres, and umbers used in the paint trade are imported from Europe and some of the cheaper grades of European oxides are able to enter the Canadian market due to the fact that these oxides are natural and do not require calcining to produce the desired colour, as is necessary for the present domestic supply.

E.H.W. February 1929.

## LITHIUM MINERALS IN 1928

### Production:

Six tons were produced in 1925, the ore mined consisting of spodumene and lepidolite. In 1926 an amount estimated at about 100 tons each of these minerals were produced, though no figures of shipments were furnished by the operators. According to unofficial records, a carload of lepidolite and the same quantity of spodumene were shipped in 1927 to an American glass firm. In 1928, there was a further small production, chiefly of lepidolite, and some small trial shipments were made.

### Exports:

The six tons produced in 1925 were exported to England for a special test to determine whether the material was suitable for the recovery of lithia salts. In 1928 a trial shipment is stated to have been made to Italy.

### Imports:

Lithia salts are not recorded separately in the Customs returns.

### Ores Mined and Producing Localities:

The principal lithium ores of commerce are lepidolite, amblygonite and spodumene.

The only locality at which lithium ores have been produced in Canada lies about 100 miles northeast of Winnipeg, Man., where the Silver Leaf Mining Co. has opened up a property about 10 miles northeast of Pointe-du-Bois. The principal minerals found in this deposit are lepidolite, spodumene and montebrasite, (a variety of amblygonite).

### Important Developments and Prospective Producing Localities:

While the district above mentioned is still in the prospect stage, it is worthy to note that the Silver Leaf is the first property in Canada from which actual shipment of lithium minerals has been made.

Sufficient work has been done on the Silver Leaf property to indicate the existence of a very considerable ore body, and there is little question that this deposit could be made to yield important tonnages of lepidolite and spodumene, as well as, perhaps, of amblygonite.

Outside of occurrences of mineralogical interest only, there is only one other district in Canada in which lithium minerals are known to occur, namely Wakefield township, Quebec, where the Leduc mine was worked in the past for tourmaline and carries lepidolite crystals up to 2 feet in diameter.

### General Situation, Market Conditions, etc.:

There is no present market in Canada for lithium ores; so, unless an extraction plant for the recovery of lithia salts is erected, the ores will have to find a market either in the United States or Europe.

The principal use of lepidolite is in the glass industry, where it is employed in the ground state as an ingredient of heat-resistant, flint and opal glasses. The lithia content of lepidolite is usually too low for it to serve as a raw material in the manufacture of lithia salts and chemicals. For the latter purpose, spodumene and amblygonite are generally used. The amount of such salts used is, however, distinctly limited and does not appear to be increasing materially, despite the known large deposits of lithium ores in the United States.

OFFICE OF THE  
DIRECTOR



DEPARTMENT OF MINES  
CANADA  
MINES BRANCH

Ottawa, April 8, 1929.

Dear Sir,-

We have recently mailed you a copy of our Annual Review of the Mineral Industry entitled, "The Canadian Mineral Industry in 1928".

We wish to call your attention to an error in the article on Magnesite, on page 28. Under "Imports, second line, - Magnesia, 743,856 tons should read 743,856 lbs. We request that you kindly make the necessary correction to your copy.

Yours very truly,

A handwritten signature in cursive script, appearing to read "John W. Kirk".

Director.

FH/MO'B

MAGNESITE IN 1928

Production:

Production of calcined and dead-burned magnesite in 1928 was 13,195 tons valued at \$346,990, as against 7,337 tons valued at \$230,309 in 1927.

Exports:

Magnesite, calcined and dead-burned, 1,837 tons, valued at \$44,101.

Imports:

Magnesite.....	220 tons valued at	\$	9,543
Magnesia.....	743,856 lbs.	" "	42,644
Magnesia pipe covering..		" "	187,381
Magnesite firebrick.....		" "	140,944

Products and Producing Localities:

Magnesite is sold by producers in three forms:— crude magnesite; caustic calcined magnesia; and dead-burned magnesite.

Practically all the Canadian production is from the townships of Grenville and Harrington in Argenteuil county, Quebec.

Several hydromagnesite deposits have been worked to some extent in British Columbia during recent years.

Important Developments and Prospective Producing Localities:

The only known magnesite deposits of commercial value in Eastern Canada are situated within a small area in the two townships in Quebec, mentioned above.

Hydromagnesite occurs in fairly large deposits in several parts of British Columbia. This material though somewhat similar in composition to hard rock magnesite is powdery in form and requires a different method of treatment to prepare it for the market.

General Situation and Market Conditions:

During the war Canadian magnesite commanded a ready market in the United States at a high price; but, later, with the discovery of deposits in that country, the reappearance of European magnesite on the market, and imposing of duty by the American Government, the demand for the Canadian product fell. The present small production is confined largely to caustic calcined magnesia and dead-burned magnesite.

H.F. February 1929.

MICA IN 1928Production:

Mica shipments in 1928 totalled 3,580 tons valued at \$82,179 compared with 2,738 tons valued at \$174,377 in 1927. The production by class is indicated below:—

	<u>1927</u>		<u>1928</u>	
Rough cobbled ---	255,925	lbs. \$16,943	--	--
Thumb trimmed --	443,090	" 72,513	91,064	lbs. \$16,698
Splittings -----	81,919	" 54,048	25,367	" 14,974
Scrap -----	4,696,058	" 30,873	7,043,795	" 50,507

Exports:

Exports of mica, including trimmed sheet, mica plate, splittings and scrap, were valued at \$326,846 in 1927 as against \$175,761 in 1928.

Imports:

Mica imports were valued at \$135,301.

Note: The important discrepancy between production and export figures is due to the fact that the former do not cover the business done by mica dealers, who make large quantities of splittings, and also scrap mica, from the cobbled and trimmed products. Indian mica, also, is imported by dealers and re-exported, largely in the form of splittings.

Ores Mined and Producing Localities:

Practically all of the mica produced in Canada is of the amber variety (phlogopite). Mica is marketed in the rough-cobbled state, as trimmed sheet, splittings, scrap, and ground mica. Trimming and splitting is done by hand.

Mica is produced mainly from mines in the Ottawa region, both in Ontario and Quebec. The Quebec deposits lie between the Lièvre and Gatineau rivers, and the Ontario deposits in the Perth-Kingston district. The mine of the General Electric Company near Sydenham, is probably the largest mica mine in the world. As in 1927, only a very small number of existing mines were operated, and production was confined to some two or three properties.

The operations for white mica conducted during 1926-27 in the Fort Grahame district, on the Finlay river, British Columbia, resulted in a small output, but were not considered sufficiently encouraging and have been suspended.

Important Developments and Prospective Producing Localities:

None.

General Situation, Market Conditions, etc.:

The market for Canadian mica was, on the whole, dull throughout a large part of the year. Sheet mica, especially the larger sizes, continued difficult to sell, the slackened demand being caused, in part at least, by the stocks of high grade sheet coming on the London market from Madagascar, Africa and other sources. These supplies show evidence of increasing, in which case Canadian producers may find continued difficulty in disposing of their larger sizes.

Scrap mica sales, for the production of ground mica, increased by almost 1,200 tons, and over \$19,600 in value.

Prices of mica are subject to considerable fluctuations, due to conditions obtaining in the trade. The following figures, however, give an approximate indication of the ruling prices for Canadian amber mica at the close of the year:

1 x 1 inches	20 cents per lb.	2 x 3 inches	50 cents per lb.
1 x 2 "	30 " " "	2 x 4 "	80 " " "
1 x 3 "	40 " " "	3 x 5 "	\$1.50 " " "

SALT IN 1928Production:

The salt marketed in 1928 was 299,445 tons valued at \$1,495,971 compared with 268,672 tons valued at \$1,614,667 in 1927. Those values as far as possible exclude the value of packages.

Exports:

Exports of salt in 1928 were recorded as 2,930 tons valued at \$36,399 as against 1,212 tons valued at \$22,793 in 1927.

Imports:

The imports of salt for 1928 were 189,025 tons valued at \$1,122,968 as against 176,761 tons valued at \$1,082,080 in 1927.

Ores Mined and Producing Localities:

Common salt, (sodium chloride), is obtained in two forms, in solution in a saturated brine, from which the salt is extracted by evaporation, and in lump or solid form by direct mining.

During the year 1928, salt was produced in southern Ontario, and in the Malagash salt district, Nova Scotia. Ontario salt is obtained from brine wells, while Malagash salt is recovered by mining rock salt, and by recovery by evaporation from brines produced by the leaching of salt from the waste piles from the mine.

Important Developments and Prospective Producing Localities:

At Waterways, Alberta, the Alberta government, through the Alberta & Great Waterways railway, has during the past year been drilling and has encountered salt formations from a depth of 670 feet to 883 feet. The possibility of utilizing this bed of salt is still being investigated.

At a lake near Senlac, Sask. salt brine was discovered a few years ago and a small production made in 1919. The property has since been idle, but interested parties have been examining this locality during the past year with a view to drilling.

At Neepawa, Manitoba, in drilling a well salt brine was encountered at depth, and if, on further testing, the flow of this brine remains fairly constant it is possible that a recovery plant will be erected.

In a well drilled for oil near Goutreau, New Brunswick, to the south of Moncton, extensive beds of rock salt were encountered between the depth of 1300 and 1800 feet. So far these extensive beds have remained unexploited but further prospecting has been carried on to determine its extent.

In Nova Scotia, at the Malagash deposit, production has been increased by better shipping facilities and the installation of a 3-pan evaporating plant.

The successful operation of the Malagash deposit has greatly stimulated the search for salt in the Maritime Provinces and further prospecting is under way.

General Situation, Market Conditions, etc.:

The Canadian production, except for small exports is sold in Canada principally to the dairy, meat-curing, fisheries, and chemical industries, and as table salt for household use. The market for salt in Canada is steadily increasing. At the present time a large tonnage is imported free of duty for use in the fisheries. This is due to the fact, that, until recently, the only producing district has been in Ontario which is unfavourably situated with respect to the market offered by the Atlantic and Pacific coast fisheries. The increasing production at Malagash will materially aid the fishing industry in the Maritime Provinces. An increasing demand for salt for the chemical industries which use sodium chloride as a basic material may reasonably be expected, since at present, with the exception of caustic soda, soda ash and small quantities of sodium sulphate, practically all of the soda products used in this country are imported.

## SILICA IN 1928

### Production:

The production of quartz in 1928 amounted to 277,225 tons valued at \$520,452 and included 62,796 tons of silica sand valued at \$141,332 and 214,429 tons of quartz, used for metallurgical purposes, valued at \$379,120.

### Exports:

None recorded.

### Imports:

The imports in 1928 amounted to 2,865 tons of silex or crystallized quartz, ground or unground, valued at \$73,755; 3,545 tons of flint and ground flint stones valued at \$36,204 and 154,384 tons of silica sand with a value of \$332,338.

### Ores Mined and Producing Localities:

The materials produced in this industry are:

Quartz for smelter flux and ferro-silicon.

Quartzite for ferro-silicon and silica brick.

Silica sand for the manufacture of glass, carborundum, etc., and for the use in the steel foundries.

Silex, the finely pulverized silica used in ceramics and the paint industry.

Quartz and quartzite are coarsely crushed and used in the manufacture of ferro-silicon in sizes from 2 to 6 inches. For silica brick it is crushed to about 8 mesh.

Silica sand is generally prepared from a friable sandstone by crushing, washing, drying and screening to recover all material between the 20 and 100 meshes.

Silex is the washed sand or pure quartz crushed and ground in some form of ball mill, then either air or water-floated to recover the fine flour. The ceramic industry require 150 mesh or finer while the paint trade require water-floated material 250 mesh or finer.

Quartzite and sand are being produced in Nova Scotia, Quebec, and Ontario. British Columbia produced small quantities of quartzite for fluxing purposes.

### Important Developments and Prospective Producing Localities:

A mill for the preparation of silica sand was erected at East Templeton, Que., in 1926 with a capacity of 200 tons of washed and dried sand per day and this mill is still in full operation. Tentative plans are also being made by the same company to erect a second mill on a property near Gananoque, Ont. Plans are also under way at one of the older plants for fine grinding of silica for the production of silex.

Tests are being carried out on samples of rock and sand from deposits at Guigues, Que., and near Perth, Ont., to determine the nature of the material at these two places and whether these deposits will lend themselves to economical operation. There are numerous deposits of silica throughout Canada which might be suitable for commercial production whenever the market warrants. The situation of these deposits with respect to the markets is at present an important factor.

### General Situation, Market Conditions, etc.:

In the use of silica for a flux, the smelters endeavour to obtain their material from the nearest possible source and in many cases they prefer a siliceous ore containing small values in the precious metals. For the manufacture of ferro-silicon and silica brick the market for the finished product limits the quantity of silica required. The demand for silica sand of a high grade is large and if it were not for the large quantities of Belgian sand being brought into Montreal as ballast at a comparatively low cost, there would be an opportunity for a number of sand plants in Canada, provided sand sufficiently low in iron could be produced. The market for silica sand and silex is steadily increasing each year.

NATURAL SODIUM SULPHATE IN 1928

(Glauber's Salt and Salt Cake)

Production:

There were 6,015 tons valued at \$69,155 produced in Canada in 1928, as against 5,659 tons valued at \$11,319 in 1927.

Exports:

A small quantity imported, but not separately recorded.

Imports:

The imports were: 356 tons of Glauber's salt valued at \$5,386 and 38,835 tons of salt cake valued at \$445,244, with also 36,561 tons of bisulphate of soda or nitre cake valued at \$311,606.

Ores Mined and Producing Localities:

The material produced in this industry may be hydrated sodium sulphate, known as Glauber's salt, or anhydrous sodium sulphate known to the trade as salt cake. It occurs as hydrous crystals, or in the form of saturated brines in numerous lakes throughout Western Canada.

The production was all from the province of Saskatchewan, the main shippers being the Bishopric & Lent Co., Dunkirk, Sask., and the Sodium Sulphate Refining Co., Fusilier, Sask.

Important Developments and Prospective Producing Localities:

The investigation of the deposits in Western Canada by the Mines Branch, Department of Mines, has proven up tonnage of hydrous sodium and magnesium sulphates in excess of 100,000,000 tons. The nature of the salts is such that a vast amount of research and experimental work in semi-commercial and commercial plants is necessary in order to devise proper methods of harvesting and drying the salts. It is encouraging to note that rapid advances have been and are being made by the pioneers already in the industry and while the returns realized have been small in comparison to the amount of money so far invested, the prospects for the future are decidedly promising. There are many deposits in the Prairie provinces which could produce sodium sulphate but while the markets are limited and the price low only those close to railroads can be considered as possible producers at present.

The General Situation and Market Conditions:

The production of sodium sulphate from the natural deposits of Western Canada is still in its infancy. There is a fairly steady market of around 40,000 tons for salt cake in the pulp and paper industry, but the largest consuming centres are in Eastern Canada and the present freight rates from the deposits to the market are an important factor. Very little of the crude material can be marketed as such, and this necessitates the installation of refining plants. The product has to compete with that made from nitre cake as well as with that produced as a by-product from hydrochloric acid manufacture, but there are hopes that simple refining methods and lower freight rates will help this industry. The increasing production of hydrochloric acid synthetically which means that less by-product salt cake will be produced, should in time materially benefit the development of the natural deposits.

PHOSPHATE IN 1928

Production:

The production of phosphate in 1928 was 436 tons valued at \$5,611, as compared with 151 tons valued at \$1,717 in 1927.

Exports:

Phosphate rock valued at \$44 was exported in 1928, as compared with \$33 in 1927.

Imports:

Imports, which are derived principally from the United States, totalled 10,181 tons valued at \$67,342, as compared with 17,485 tons valued at \$94,758 in 1927.

Ores Mined and Producing Localities:

Previous to 1927, practically all of the small production of phosphate in Canada for the last ten or fifteen years consisted of apatite recovered from old waste dumps or secured during mining operations for mica in the Ontario-Quebec mica-phosphate field. Most of the output was taken by the Electric Reduction Company, at Buckingham, Que., and is presumed to have gone into phosphorus.

Important Developments and Prospective Producing Localities:

In 1926-27, the Consolidated Mining and Smelting Company undertook an investigation of low grade sedimentary phosphate beds in the Crow's Nest district, British Columbia, in order to determine whether the material could be concentrated to serve as raw material for the manufacture of superphosphate. A large number of claims were taken up, and a small amount of phosphate rock was mined near Crow's Nest, concentrated at Trail, and converted into triple superphosphate. Tests of this material are now under way in the Prairie provinces, with the collaboration of the provincial Agricultural Departments and the Canadian Pacific railway. If the results are satisfactory, the Company plans the addition of a superphosphate unit to its Trail plant. By making triple, instead of ordinary superphosphate, the freight costs on the fertilizer are very materially reduced.

General Situation, Market Conditions, etc.:

No information.

H.S.S. February 1929.

TALC AND SOAPSTONE IN 1928

Production:

The production of ground talc in 1928 amounted to 14,924 tons valued at \$179,186 compared with 15,110 tons valued at \$178,931 in 1927. The output of block soapstone was valued at \$40,471.

Exports:

Exports of ground talc in 1928 totalled 10,946 tons valued at \$133,601 compared with 10,692 tons valued at \$125,123 in 1927. In 1927 there was an export of 12 tons of crude talc valued at \$154.

Imports:

The imports for 1928 were 5,421 tons valued at \$91,672 compared with 4,907 tons valued at \$86,858 in 1927. These figures relate to ground talc and block soapstone.

Ores Mined and Producing Localities:

Most of the talc produced undergoes grinding at Mills situated at or near the mines, and is marketed as ground talc of three grades, according to fineness. Powdered talc is produced at Madoc, Ontario, where there are two mines and mills in operation. A third mine with mill, exists at Eldorado, a few miles north of Madoc, but has been idle for several years. There has also been an intermittent production from deposits near Victoria, Vancouver Island, and near Keefers and D'Arcy, in British Columbia. The Victoria and D'Arcy material is a rather impure talc, which finds employment in the roofing trade. The Keefers talc is of a superior grade, and has been successfully employed in paper, soap and paints; a small mill exists on this property and some shipments have been made to coast points. Deposits of massive talc (steatite) occur near Vermilion Summit, on the Alberta-British Columbia divide, and a Toronto syndicate was incorporated in 1927 for the purpose of mining this material for lava purposes.

Soapstone was produced for the first time in 1922, the material being taken out in block form and consigned to kraft paper mills for furnace linings; this stone came from a deposit at Robertson, Quebec. Other deposits have since been opened up in the same district; and important developments are also reported from Vermilion bay, Lake of the Woods region, Ont., where a large plant has been installed for the production of cut soapstone. A company formed in 1922 to develop a soapstone deposit at Wabigoon, Lake of the Woods region, Ontario, has not yet commenced operations.

Important Developments and Prospective Producing Localities:

Nothing to report.

General Situation, Market Conditions, etc.:

There was little change in the general tone of the talc industry during 1928.

It is encouraging to note that the production of block soapstone in Canada is increasing. Canadian kraft-paper mills import considerable quantities of soapstone blocks or bricks for lining their smelting furnaces from American and Norwegian sources. The delivered cost of this stone, which is subject to import duty, is high, and it is very desirable that a domestic supply should be developed. The Quebec and western Ontario deposits show promise of being able to furnish a large output of stone comparable in all respects to the American and Scandinavian soapstone now imported.

The commercial utilization of the soapstone dust from the sawing benches at the Quebec quarries has been considered, and tests were under way during 1928 in the Ceramic division of the Mines Branch to devise methods of bonding this dust to form slabs and plates for use as insulation in cooking range walls, etc. The erection of a grinding mill to treat quarry waste and make roofing, foundry, and other grades of talc is also under consideration by the Quebec operators.

VOLCANIC DUST IN 1928Production:

The production of volcanic dust in 1928 was 485 tons valued at \$9,795 as against 105 tons valued at \$735 in 1927.

Exports:

Not separately recorded.

Imports:

Included under pumice, pumice stone, lava, and calcareous tufa, valued at \$48,062 as against \$35,211 in 1927.

Ores Mined and Producing Localities:

Volcanic dust beds 30 feet thick have been worked by the Van Kel Cleansers, Ltd., and by the Old Sol Manufacturing Co., from deposits near Waldeck, 11 miles northeast of Swift Current, Sask. The former are now erecting a new treatment plant at Swift Current. They doubled their output in 1928.

Important Developments and Prospective Producing Localities:

Extensive and pure deposits occur on the Deadman river, 30 miles north of Ashcroft, British Columbia; also on the east shore of the Arrow lakes, 25 miles south of Nakusp, B.C. Several other deposits have recently been discovered in the vicinity of the Saskatchewan producers, and increased development may be expected.

General Situation, Market Conditions, etc.:

Volcanic dust is used for purposes similar to ground pumice, particularly in the manufacture of cleansers and scouring powders, and in some instances as a substitute for fuller's earth in the refining of hard oils and fats. Although the domestic market is not large, nevertheless, only about 2 per cent is supplied by the home product. Foreign markets are supplied mainly from material from Italy and the United States.

CEMENT IN 1928Production:

The production of cement in Canada in 1928 was 10,954,184, barrels, valued at \$16,583,703, as against 10,065,865 barrels valued at \$14,391,937 in 1927 and 8,707,021 barrels valued at \$13,013,283 in 1926.

Exports:

267,325 barrels valued at \$340,624 as against 249,694 barrels valued at \$308,144 in 1927.

Imports:

Portland and hydraulic or water lime 34,047 barrels valued at \$146,164 as against 19,354 barrels valued at \$87,541 in 1927. Cement n.o.p. and manufacture of, valued at \$31,594 as against \$17,879 in 1927.

Materials used and Producing Localities:

The chief raw materials used in the manufacture of cement are limestone and clay.

The chief product is Portland cement for the production of which there are 19 plants having an aggregate rated annual capacity of over 15 million barrels; five of these are not operating and one is still in the construction stage. The actual production capacity of the operating plants is about 13 million barrels. The large excess capacity over production is easily explained. The cement plant is the handmaid of the building and construction industries. These industries are subject to wide seasonal fluctuations in activity, mainly because of climatic influences. In certain months the demand for building materials is such as to tax the productive resources of the manufacturing industries, while in other months the quantities required are very small.

In addition to the plants manufacturing Portland cement there is one plant in Nova Scotia capable of making cement from blast furnace slag and one in Manitoba making puzzolan or natural rock cement.

Important Developments and Prospective Producing Localities:

No new development to report.

The cement industry is open to much expansion in the whole of Canada, with the exception of Prince Edward Island and Saskatchewan. The raw materials are plentiful and further expansion is simply a question of markets and trade conditions.

General Situation, Market Conditions, etc.:

The production in 1928 was about 73 per cent of the total capacity of the milling plants, being the highest ever reported, the next highest production having been obtained in 1927 and amounted to 67 per cent of the total capacity. The exports in 1928 constituted the maximum for the industry in Canada. The average selling price per barrel, f.o.b. plant was as follows:

	1927	1928
Quebec.....	\$1.16	\$1.28
Ontario.....	1.37	1.41
Manitoba.....	2.49	2.43
Alberta.....	2.17	2.07
British Columbia.....	1.97	2.23

A.B. February 1929.

KAOLIN (CHINA CLAY) AND BALL CLAY, 1928

Production:

There has been no production of china clay since 1923, though a shipment of 24 tons was made to the Mines Branch for testing purposes in 1927.

Small shipments of crude ball clay have been made from time to time, but no regular productions maintained.

Exports:

Clays unmanufactured, 19,903 cwt., valued at \$20,577.

Imports:

China clay, ground or unground: 462,357 cwt., valued at \$262,207. No figures for the import of ball clay are available.

Products and Producing Locality:

The only place where china clay has been produced commercially in Canada is at St. Remi d'Amherst, in Quebec.

Ball clay has been shipped from the vicinity of Readlyn and Willows in southern Saskatchewan to pottery manufacturers in Ontario and the United States. So far, only crude, unwashed clay has been shipped.

Important Developments and Prospective Producing Localities:

The occurrence of china clay has been reported from only a few sections of Canada.

A deposit of high grade, white-burning clay associated with fireclay on the Mattagami river, Ontario, is reported by the owners to be of large extent. (See Geol. Surv. Summary Report, 1926, Part C, p. 16; also article by W. S. Dyer in Can. Min. and Met. Bulletin, April, 1928).

A deposit of white-burning clay occurs on Punk island, Lake Winnipeg, Manitoba, but it is small in amount and would be difficult to mine.

Ball clay has been reported only from southern Saskatchewan where there is evidently an extensive occurrence of it about 60 miles to the south of Moose Jaw.

Near Williams Lake, B. C., is a deposit referred to in the report of the Minister of Mines of B. C., 1926, as consisting of "silicate of alumina." This material, if not a true kaolin, is closely allied to it. Some trial shipments have been made to Vancouver and were used as a fireclay.

General Situation, Market Conditions, etc.:

There is a large, steady demand for china clay in Canada, for use in the manufacture of paper, rubber and porcelain.

Ball clay is used in the manufacture of porcelain. While the market in Canada is not large, there are good prospects of developing a profitable export market in the United States.

LIME IN 1928Production:

In 1928 the production of lime in Canada was as follows:--

Quicklime	432,153	tons	valued at	\$3,508,579
Hydrated lime	78,885	"	"	964,201
Total - - - -	<u>511,038</u>	"	"	<u>\$4,472,780</u>

This is a record production.

Exports:

The exports of lime are largely from British Columbia to the United States, the Phillipines, Honolulu, Hawaii, Central America, and New Zealand. In 1928 the exports totalled 20,043 tons valued at \$357,085.

Imports:

The greater part of the imports is Ohio finishing lime. Some lime is also imported from Michigan by the pulp mills in northern Ontario. In 1928 the imports totalled 5,417 tons valued at \$64,811.

Ores Mined and Producing Localities:

Lime is burned in every province of Canada with the exception of Prince Edward Island and Saskatchewan. Both high-calcium and magnesium limes are produced from the limestones of Nova Scotia, New Brunswick, Ontario and Manitoba, but in Quebec, Alberta and British Columbia high-calcium limes only are produced at present.

The lime is marketed in the form of quicklime and as hydrated lime. The tendency is toward the greater production of hydrated lime particularly for use in the building trades and chemical industries.

Of the total production, Ontario accounted for about 54 per cent of the quicklime and 62 per cent of the hydrated lime, and Quebec followed with 24 per cent of the quicklime and 14 per cent of the hydrated lime.

Forty companies operating 60 plants were engaged in lime production during 1928.

Important Developments and Prospective Producing Localities:

There have been no outstanding developments in the lime industry during 1928, but a big expansion, especially in the chemical lime business, is not far distant.

Prospective producing localities are too numerous to list.

General Situation, Market Conditions, etc.:

From all parts of the country lime manufacturers report a record volume of sales. In western and Maritime Canada prices were maintained at a satisfactory level, but in Ontario and Quebec prices were affected somewhat by increased domestic competition and by competition from the United States, in which country price cutting has become acute.

The industry is now practically in the hands of the large producers and each year fewer of the small pot kilns, which formerly dotted the countryside in the limestone areas, are operated. There has been a marked improvement in the methods and machinery used in the lime industry during recent years and costs have been lowered. This improvement in technology will undoubtedly be more marked in the near future for the lime industry might now be termed a key industry among manufacturing industries and more and more attention is being devoted to its improvement each year.

The market for lime is almost entirely domestic; the principal consumers are the building trades, the pulp and paper, and chemical industries.

## LIMESTONE IN 1928

### Production:

In 1928 the production of limestone in Canada for all purposes exclusive of that used for the manufacture of cement and lime was 6,766,244 tons valued at \$6,998,615 as against 6,316,476 tons valued at \$6,688,092 in 1927. The 1928 production is the highest on record.

### Exports:

The exports of limestones are almost negligible. No separate record kept.

### Imports:

Considerable building stone is imported from the United States and a large tonnage of limestone for use as flux is imported from the United States and Newfoundland. Some of the pulp mills in northern Ontario import their limestones from Michigan. No separate record kept.

### Products and Producing Localities:

Every province of Canada except Prince Edward Island contains workable deposits of good quality limestone. In the case of Saskatchewan the limestone is inaccessible at present, and it is not worked. Ontario was the principal producer, and Quebec came next.

The chief products vary in the different provinces. In Ontario and Quebec the principal product is crushed stone which is used for railroad ballast, road metal and as aggregate in concrete. In Manitoba the chief product is building stone; in Nova Scotia, flux; in British Columbia, flux; and in New Brunswick, agricultural limestone. The cement and lime industries utilize large quantities of limestone but their requirements are not included in the above figures on production.

### Important Developments and Prospective Producing Localities:

There have been no new developments in connexion with limestone during 1928.

Owing to the abundance of limestone in Canada, the prospective producing localities are too numerous to list.

### General Situation, Market Conditions, etc.:

At the beginning of the present century the uses of limestone were comparatively few and production was small. Today when the amount used for all purposes is considered it ranks among the foremost of non-metallic minerals in value of production. Owing to the abundance of high-grade limestone in nearly every province the limestone quarrying industry is decentralized and only when it is viewed as a whole does its real extent and value become manifest.

There are three principal markets for limestone: 1. Building and Road construction; 2. Chemical and Metallurgical industries; 3. Agriculture. The outlook for increased sales in each of these markets is promising, particularly so in the agricultural market for the value of ground limestone for soil conditioning purposes is being more widely recognized and increased use will follow.

Owing to the diversity of products and to the dearth of published statistics relating to limestone, it is impossible to quote unit prices for the various products.

COAL IN 1928Production:

The production of coal in Canada in 1928 was 17,554,293 tons, valued at \$62,681,136 consisting of:-

Bituminous.....	12,969,870 tons,	valued at	\$49,536,124
Sub-bituminous...	740,496 "	" "	2,076,212
Lignite.....	3,843,927 "	" "	11,068,800

In 1927 the production was 17,426,861 tons, valued at \$61,867,463.

Exports:

The exports in 1928 were 863,941 tons, as against 1,113,300 tons in 1927.

Imports:

The imports of coal entered for consumption in 1928 amounted to 17,205,541 tons and consisted of 16,515,149 tons from the United States, 682,755 tons from Great Britain and 7,637 tons from other countries.

Coal Mined and Producing Localities:

Nova Scotia, New Brunswick, and British Columbia produce bituminous coal only; Saskatchewan produces lignite; and Alberta produces bituminous, sub-bituminous and lignite coals.

Important Developments and Prospective Producing Localities:

The re-examination of deposits of lignite on the Abitibi river is planned by the Department of Mines of Ontario for the summer of 1929. A plant for carbonizing Souris Valley lignites and briquetting the resulting coke has been completed and is in operation in Saskatchewan. Deposits of lignites have been opened at Willow Creek and at Wallace, Alberta. There has been a noticeable increase over the previous year in the production of coals in Alberta and in British Columbia. Unification of the two major coal mining operations on Vancouver Island has been effective since September and beneficial results are expected. There are a number of known undeveloped areas in Alberta, British Columbia and Yukon, but commercial conditions do not warrant development at present.

General Situation and Market Conditions:

The problem of a coal supply for central Canada is gradually assuming a more promising aspect. The provinces formerly entirely dependent on supplies of coal from the United States are gradually substituting fuels from other sources. The year 1928 witnessed an increased use of Maritime coal in Quebec, and some Alberta coal was brought into Ontario. The central provinces have, in the past, been dependent on domestic fuels from the United States, and considerable hardships have at times ensued where supplies were interrupted by labour troubles; this situation is being in part relieved by the importation of Welsh and Scotch anthracites. These importations and the use of substitute fuels, such as domestic cokes, have materially reduced the consumption of Pennsylvania anthracites.

A.B. February 1929.  
R.A.S.

COKE IN 1928Production:

The production of coke (including both by-product and gas-house) in Canada in 1928 was 2,308,127 tons as against 2,026,438 tons in 1927.

Exports:

The exports of coke amounted to 44,915 tons, as against 91,533 tons in 1927.

Imports:

The imports of coke amounted to 1,060,029 tons, as against 796,285 tons in 1927.

Producing Localities:

Coke is being produced chiefly by the treatment of bituminous coal; a small production is also obtained from the distillation of petroleum.

Coke derived from the treatment of coal or petroleum is now produced in every province of the Dominion with the single exception of Prince Edward Island.

Important Developments and Prospective Producing Localities:

During the year a new plant capable of treating 1,200 tons of coal per day came into operation in Montreal. This plant was erected by the Koppers Company in conjunction with the Montreal Light, Heat and Power Company and the output is designed principally for domestic consumption.

The Halifax gas works during the year remodelled their existing plant in order to produce a better grade of domestic coke. An interesting feature of this plant is the provision for using Canadian coal.

The Steel Company of Canada, Hamilton, Ontario, remodelled their coke sizing plant and are at present selling a portion of their output for domestic use.

In all probability coke plants will be established in the near future in Ontario at Port Stanley and at Fort William.

General Situation, Market Conditions, etc.:

Activity in the coke market is evidenced by a greater demand for metallurgical coke and by an increasing use of coke as a domestic fuel.

The expanding consumption of both oven coke and gas coke for domestic heating has greatly lessened the dependence of the central provinces on American anthracite.

A.B. February 1929.  
R.A.S.

NATURAL GAS IN 1928Production:

The production of natural gas in 1928 amounted to 22,431,272 thousand cubic feet valued at \$8,249,309 as against 21,376,791 thousand cubic feet of natural gas valued at \$8,043,010 in 1927.

Exports:

None.

Imports:

No natural gas has been imported, though the supply at Niagara Falls, Ont., has been increased by the importation of 128,004 M. cu. ft. of manufactured gas valued at \$82,681, as against 104,001 M. cu. ft. valued at \$65,759 in 1927.

Producing Localities:

The chief producing localities in Alberta are the Viking field supplying Edmonton and the Foremost and Turner Valley fields feeding the pipe lines to Calgary. The greatly increased activity in drilling for oil in the Turner Valley field has resulted in large supplies of gas becoming available for Calgary. Good wells have also been brought in at Foremost.

In Ontario the chief fields are in Lambton, Kent, Norfolk, Haldimand and Welland counties. Some productive wells were drilled during the year in Middleton township, Norfolk county, which greatly helped in supplying towns in that neighbourhood.

In New Brunswick a small gas field near Moncton supplies that city with natural gas for domestic and industrial purposes; the gas is also piped into Hillsboro.

Important Developments and Prospective Producing Localities:

Outstanding developments of the year were the discovery of dry gas in considerable volume in the Ribstone and Cyprus Hills areas and the completion of well No. 1 of the Okalta Oils Ltd. in Turner Valley, where a heavy flow of gas as well as oil has been obtained.

In Alberta large flows of natural gas have been opened up in many of the new wells in the Turner Valley and in other points in the foothills and other large flows are available in the Wainwright area, and in the Sweet Grass area of southern Alberta, where the Rogers-Imperial well, with a flow of some 50,000,000 cubic feet, has been successfully capped for future use.

General Situation, Market Conditions, etc.:

All the gas companies operating in Alberta which supply practically all the larger towns and villages, have ample reserves of gas, and the consumption in 1928 amounted to about 15,000,000 thousand cubic feet.

Although there was a small decline in the production in Ontario the supply of gas was sufficient to meet the demand. There was a small increase in gas rates in many of the localities supplied and the conservation brought about by more careful use of gas, and by closer attention to up-keep and cleaning out of wells accounts for the more satisfactory condition.

A.B. February 1929.

OIL SHALE IN 1928Production:

Nil.

Exports:

Nil.

Imports:

None recorded.

Producing Localities:

None.

Important Developments and Prospective Producing Localities:

There has been greater activity in oil shale development during 1928 than for several years past. The Maritime Education Company have completed the erection of their plant near Rosevale, New Brunswick. This plant, which will handle 100 tons of shale per day is stated to have cost between \$300,000 and \$400,000, and is ready to start operations, but is being held up at the present time due to the reorganization of the company. The Torbanite Products Company, Limited are erecting a 50-ton a day plant near New Glasgow, Nova Scotia, which is expected to be completed early in 1929. At the present time, the retort building has been erected and the excavations for the crusher building have been completed. These two plants, when running to capacity, will be able to produce from 100 to 150 barrels of shale oil per day.

NOVA SCOTIA:- The principal recognized occurrences of oil shale (and certain sub-varieties), are found in Pictou and Antigonish counties. Of these, the deposits in Pictou county are the more promising. During the past two years, Oil and Nitrates Products, Ltd., (H.F.C. Spence, Mgr., New Glasgow, N.S.) have been investigating possibilities of commercial development in this area.

NEW BRUNSWICK:- In Albert and Westmorland counties there is a large aggregate tonnage of valuable oil shale. In 1921 the D'Arcy Exploration Co. installed an experimental retort, near Rosevale, Albert county, and have also made a detailed study of portions of the shale area. Results of this work have not been announced. At the present time (January 1929) the following companies are interested in proposed commercial development, viz: Maritime Education Co., Shale Hill, Rosevale, N.B., K.E. Clayton-Kennedy, Chief Engineer; and Albertite Chemical Oil & Fertilizer Co., Ltd., Albert Mines, N.B., Louis Simpson, Mgr.

General Situation, Market Conditions, etc.:

Until quite recently activity has been chiefly confined to field exploration and laboratory investigations. Laboratory work by the Department of Mines has included:

1. Determination of petroleum content of representative samples from various localities.
2. Determination of important factors affecting the recovery of crude petroleum by destructive distillation and the character of the petroleum recovered.
3. Investigation of the processes designed for the distillation of oil shales.
4. Prospective large scale work:- Provision is being made in the Fuel Research Laboratories for trying out on a technical scale the more promising of the processes for distilling oil shales, using temporary retorts constructed according to different designs. Pressure cracking stills will also be erected and with this equipment, processes for treating the shale oils will be investigated.

In addition the Forest Products Laboratories are conducting tests to determine the value of shale oil as a wood preservative, but their report is not yet available.

PEAT IN 1928

Production: 6,000 tons.  
Exports: None.  
Imports: None recorded.

Peat Bogs Worked:

On May 15, 1928, the peat manufacturing plant constructed by the Department of Mines during 1927 was put in operation. The manufacture of peat fuel was conducted until September 15, 1928, and a total of 10,000 tons of fuel were laid on the field. Of this quantity about 6,000 tons were harvested, including a little over 5,000 tons laid down at railway siding and about 750 tons on the field. Up to December 31, 1928, a little over 1,200 tons of fuel were shipped from the bog to customers.

The reports of investigations are contained in the summary reports of the Mines Branch.

The most recent special reports on peat are publication No.641—"The Manufacture and Uses of Peat", and No.614—"Facts about Peat".

Important Developments and Prospective Producing Localities:

It is reported that a plant is in the course of erection on the St.Hyacinthe bog at St.Hyacinthe, Quebec, which will operate according to the hydro-peat process. The capacity of this plant, as is estimated, will be about 15,000 tons.

There are a large number of peat bogs scattered over central and eastern Canada containing material suitable for the manufacture of fuel. Many of these are favourably situated with respect to possible markets.

The General Situation, Market Conditions, etc.:

On account of the high price and anticipated diminution in the supply of U.S. anthracite available to Canadian consumers; the increasing cost and scarcity of wood, generally speaking, in localities where peat is available; and the superiority of peat as a fuel for any purpose for which wood is used; there should be a good demand for machine made peat for household use. Peat is a satisfactory fuel for open fireplaces, and for fall and spring use in furnaces and for summer cooking.

B.F.H. February 1929.

PETROLEUM IN 1928.Production:

The production of crude petroleum in Canada in 1928 amounted to 630,405 barrels valued at \$2,058,935, as against 476,591 barrels valued at \$1,516,043 in 1927.

Exports:

Crude and refined oil, kerosene, gasoline, etc. 27,066,513 gals. valued at \$1,997,247, and wax 10,010 cwt. valued at \$54,501.

Imports:

Petroleum and its products to the value of \$61,675,989, as against \$52,878,717 in 1927.

Producing Localities:

The chief producing localities are the Petrolia and Ennis-Killen, the Oil Springs, and the Bothwell fields in western Ontario, and the Turner Valley field, Alberta.

Up to 1924 the western Ontario field was the only producing locality in Canada of any importance, but; with the bringing in of the Royalite No. 4 well in the Turner Valley field, in the fall of 1924, Alberta took first place with a production of 183,491 bbls. in 1925, and 480,094 bbls. in 1928. The Royalite No. 4 well yielded on an average of 455 bbls. of light oil (naphtha) per day in 1925 and over 600 bbls. for the last three years.

At the end of 1928 there were 21 completed wells in Turner Valley with a combined daily production of about 1,200 bbls. of 70-73° Be. naphtha, 250 bbls. crude oil and 60,000,000 M. cu.ft. of gas. In addition about 35 wells were drilling in the field. Results to date indicate that Turner Valley is to be one of the world's large natural gas fields.

The Wainwright field located about 160 miles east of Edmonton has been undergoing development for several years. About 12 wells have been drilled, many yielding dry gas and oil showings, but not more than three may be considered possible commercially productive wells.

About 20 wells are being drilled in other parts of Alberta, and a few wells were drilled in Saskatchewan and British Columbia.

In New Brunswick several wells have been drilled in various areas and the production is still relatively small.

Important Developments and Prospective Producing Localities:

Outstanding features of the year's activities were the discovery of dry gas in considerable volume in the Ribstone and Cyprus Hills areas and the successful completion of Okalta No. 1 well in Turner Valley.

Apart from the intensive drilling which has been going on these last two years in the Turner Valley and Wainwright fields, drilling is being done in various other parts of the province, notably in the Medicine Hat and Bow Island gas fields. The total footage drilled was approximately 170,000 representing 101 wells in actual drilling and of these 17 are now producing oil and gas; 3 wells gas only, and 7 wells were abandoned.

The only oil found in the Plains area has been heavy and the wells have produced such small quantities that they are at best of doubtful commercial value, but exploration is being proceeded with in a very systematic and intelligent way and the future alone will determine the economic possibilities of the Plains area.

The General Situation, etc.:

The outstanding feature of the year is the continued successful development in the Turner Valley field with prospects of a considerable increase in production in the near future.

In western Ontario the continued decrease in production, with the exception of 1927, has been attributed to the natural decline of the field which is over sixty years old, and to the final removal of the bounty on petroleum in July 1925.

