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PROVINCE OF ONTARIO
DEPARTMENT OF MINES

HON. PAUL LEDUC, *Minister of Mines*

THOS. W. GIBSON, *Deputy Minister*

Bulletin No. 98

PRELIMINARY REPORT

ON THE

Mineral Production of Ontario

IN

1934

Prepared by W. R. ROGERS and A. C. YOUNG

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO

TORONTO

Printed and Published by T. E. Bowman, Printer to the King's Most Excellent Majesty
1935

INTRODUCTORY LETTER

TO THE HON. PAUL LEDUC,

Minister of Mines.

SIR,—The undersigned have the honour to present an advance statement dealing with the mineral production of the Province of Ontario for the year 1934. For purposes of comparison final figures for 1933 are given in the table (page 4). The report covers the output of mines, quarries, clay and gravel pits, also the products of metallurgical plants treating Ontario ores and minerals.

These statistics, with such additions and corrections as may prove necessary, will be embodied in the Forty-fourth Annual Report of the Ontario Department of Mines, in which the mineral industry for 1934 will be reviewed in greater detail. The Mineral Production Bulletin is issued each year in March, and the statistics are presented at the annual general meeting of the Canadian Institute of Mining and Metallurgy along with reports from other Provinces and Canada at large.

Acknowledgment is made to all producers whose prompt response in forwarding statistics has rendered this report possible. Since 1921 identical mineral production forms have served both the Dominion Bureau of Statistics and the Ontario Department of Mines, and through this co-operation a saving to operators in time and effort has been effected.

Respectfully submitted,

W. R. ROGERS,

A. C. YOUNG,

Publications and Statistics Branch.

DEPARTMENT OF MINES,

Toronto, March 7, 1935.

MINERAL PRODUCTION OF ONTARIO IN 1934

General Remarks

Mineral production for 1934, valued at \$144,125,139, exceeded that of any previous year. The metal group showed a marked increase over the figures for 1933, or in fact over any preceding year. Indeed, the metals alone had a value considerably in advance of the entire mineral production of 1929, the former peak year, when the total output was worth \$118,118,178.

Reference to the main table shows that the valuation of gold has increased 16 per cent., silver 32, nickel 59, copper 37, and platinum metals, which are a by-product of the nickel-copper industry and dependent entirely upon the prosperity of that industry, showed a gain of 312 per cent.

The Dominion Bureau of Statistics has reported the value of Ontario field crops as \$143,456,000 for 1934, or the highest figure since 1930. This is the first time in the history of the Province that mineral production had a value in excess of field crops, and affords a striking illustration of the growing importance of the mining industry in the economic life of Ontario.

In the total production of metals in Ontario, noted hereunder, gold moved up from third to first place in 1927:—

Metal or product	Production to December 31, 1933	Production, 1934	Production to December 31, 1934
	\$	\$	\$
Gold (Canadian funds)	514,241,986	70,966,914	585,208,900
Nickel, including nickel oxide and salts	359,383,615	32,139,425	391,523,040
Silver	257,686,623	2,602,326	260,288,949
Copper (a)	145,225,872	14,822,704	160,048,576
Pig iron from domestic ore	84,775,556	..	84,775,556
Platinum metals	24,806,192	6,187,992	30,994,184
Cobalt (b)	25,929,269	589,933	26,519,202
Iron ore (c)	9,463,516	..	9,463,516
Lead	4,485,314	525	4,485,839
Zinc, in ore and concentrates	535,696	..	535,696
Molybdenite	210,015	..	210,015
Bismuth	151,459	3,444	154,903
Miscellaneous	85,853	113,888	199,741
Grand Total	1,426,980,966	127,427,151	1,554,408,117

(a) Includes small quantities of copper sulphate.

(b) Includes metal, oxide, salts, and cobalt contents of residues exported.

(c) Value of ore shipped out of the Province.

Dividends:—During 1934 dividends were paid by 12 gold, 2 nickel-copper, and 2 silver-cobalt mining companies. Total payments by metal mines of the Province are noted hereunder by groups:—

TOTAL DIVIDENDS PAID BY METAL MINES

Industry	Total to end of 1933	During 1934	Total to end of 1934
	\$	\$	\$
Gold	153,107,352	26,841,466	179,948,858
Nickel-Copper	149,723,449	10,126,014	159,849,463
Silver-Cobalt*	97,691,281	260,000	97,951,281
Grand Total	400,522,122	37,227,480	437,749,602

*Does not include O'Brien or Miller Lake O'Brien which are privately owned mines.

TABLE I.—SUMMARY OF MINERAL STATISTICS OF ONTARIO FOR 1933 AND 1934.

Product (tons of 2,000 lb.)	1933		1934	
	Quantity	Value	Quantity	Value
METALLIC:				
Gold (Canadian funds) oz.	2,155,518	\$ 61,044,951	2,105,981	70,966,914
Silver oz.	5,375,030	1,912,934	5,528,187	2,602,326
Copper in matte exported (a) lb.	20,398,169	917,918	13,383,479	602,257
Copper metallic and in concentrates, exported "	125,106,551	9,200,929	191,676,060	14,220,447
Nickel in matte, in speiss, and in ore exported; metallic nickel, also nickel content of oxides and salts "	83,264,638	20,130,480	128,687,340	32,139,425
Platinum metals oz.	55,755	1,501,233	200,109	6,187,992
Bismuth oz.	7,580	3,731	7,552	3,444
Cobalt in metal, oxides, salts, residues, and ores "	466,702	597,752	588,566	589,933
Lead in concentrates exported "	29,910	692	21,558	525
Miscellaneous "	..	53,745	.	113,888
Total		95,364,365	..	127,427,151
NON-METALLIC:				
Actinolite tons			30	365
Arsenic, white lb.	1,468,022	56,534	1,647,513	56,412
Barite tons	20	60	..	..
Diatomite "	28	1,298	44	1,760
Feldspar, crude and ground "	4,387	45,350	6,335	55,353
Fluorspar "	73	1,064	150	2,100
Graphite, crude and refined "	362	16,145	.	64,998
Gypsum "	24,460	112,319	33,234	141,389
Iron pyrites and sulphur (b) "	8,196	81,960	14,598	145,980
Mica "	666	9,371	618	9,059
Mineral waters Imp. gals.	29,794	2,347	21,775	1,622
Natural gas M. cu. ft.	7,166,659	4,523,084	7,327,474	4,396,484
Peat tons	450	900	786	1,008
Petroleum, crude bbls.	136,058	253,486	141,384	299,874
Quartzite and quartz tons	66,562	86,146	89,167	133,069
Silica brick M.	183	7,351	452	22,053
Salt tons	244,107	1,755,087	276,751	1,734,196
Talc and soapstone "	15,114	142,134	13,934	135,978
Total		7,094,636	..	7,201,700
STRUCTURAL MATERIALS:				
Cement, Portland bbls.	1,095,845	1,587,812	1,702,128	2,403,590
Hydrated lime tons	19,733	220,291	22,280	249,026
Quicklime "	126,460	1,006,905	168,215	1,284,418
Sand and gravel "	5,670,030	2,467,916	7,755,089	2,530,688
Sand-lime products (c) "		69,785		145,155
Stone: limestone, trap, granite, slate tons	1,253,907	983,268	2,137,861	1,653,684
Total		6,335,977	..	8,266,597
CLAY PRODUCTS:				
Brick, face no.	17,254,578	351,292	22,853,452	467,817
" common "	11,822,004	163,338	15,418,439	218,723
" fancy and ornamental "	6,309	387	14,277	835
" sewer "	242,289	3,683	307,147	5,992
Tile, drain "	8,745,559	179,015	5,460,333	127,890
" structural, roofing and floor "		74,064		120,696
Sewer pipe, copings, flue-linings, etc. "		185,138	..	226,263
Pottery tons		52,650	..	52,578
Haydite "		15,012	..	9,790
Total		1,024,579	..	1,230,584
Total value in Canadian funds		109,819,557	..	144,126,032

(a) Copper in matte valued at 4½ cents per pound, and nickel at 18 cents.

(b) Tonnage given is sulphur content of sulphuric acid; no iron pyrites was sold in 1934.

(c) No deduction made for lime used in manufacturing.

TABLE II.—COMPARATIVE VALUE OF MINERAL PRODUCTION, 1930-1934

Product	1930	1931	1932	1933	1934
METALLIC:	\$	\$	\$	\$	\$
Gold (Canadian funds)	35,922,260	45,043,837	53,418,449	61,044,951	70,966,914
Silver	3,998,112	1,880,860	1,910,937	1,912,934	2,602,326
Platinum metals	2,436,683	2,812,834	1,998,911	1,501,233	6,187,992
Cobalt (a)	1,144,007	651,179	587,957	597,752	589,933
Nickel (b)	24,455,134	15,005,080	7,179,862	20,130,480	32,139,425
Copper, metallic and in matte	15,186,467	8,907,069	5,025,684	10,118,847	14,822,704
Lead, pig, and in ore	116,034	41,987	1,756	692	525
Zinc in ore and concentrates	127,004				
Bismuth	6,366	3,532	7,289	3,731	3,444
Molybdenite		280			
Miscellaneous		32,108		53,745	113,888
Total	83,393,067	74,378,766	70,130,845	95,364,365	127,427,151
NON-METALLIC:					
Actinolite	437	456			365
Arsenic, white	109,932	135,170	98,914	56,534	56,412
Barites				60	
Diatomite	140	840	309	1,298	1,760
Feldspar, crude and ground	104,670	103,008	42,920	45,350	55,353
Fluorspar	1,240	620	464	1,064	2,100
Graphite, crude and refined	86,543	32,149	18,483	16,145	64,998
Gypsum	776,069	374,469	186,176	112,319	141,389
Iron pyrites and sulphur (c)	73,855	65,080	33,320	81,960	145,980
Mica	34,275	23,465	2,752	9,371	9,059
Mineral waters	20,754	8,578	2,473	2,347	1,622
Natural gas	5,061,588	4,635,497	4,719,297	4,523,084	4,396,484
Peat fuel	1,602	1,096	10,107	900	1,008
Petroleum, crude	235,746	219,993	247,468	253,486	299,874
Quartzite and quartz	274,674	148,642	93,574	86,146	133,069
Silica brick	19,120	13,702	4,303	7,351	22,053
Salt	1,558,405	1,558,388	1,789,752	1,755,087	1,734,196
Talc and soapstone	133,213	122,044	111,585	142,134	135,978
Total	8,492,263	7,642,308	7,361,897	7,094,636	7,201,700
STRUCTURAL MATERIALS:					
Cement, Portland	5,779,404	5,006,826	2,288,975	1,587,812	2,403,590
Lime, hydrated and quicklime	2,177,587	1,221,190	1,273,230	1,227,196	1,533,444
Sand and gravel	3,559,487	2,317,015	2,000,298	2,467,916	2,530,688
Sand-lime brick (d)	424,178	253,228	78,398	69,785	145,155
Stone: limestone, trap, granite, etc.	4,630,970	3,197,297	1,655,016	983,268	1,653,684
Total	16,571,626	11,995,556	7,295,917	6,335,977	8,266,597
CLAY PRODUCTS:					
Brick, face	1,811,569	1,278,954	532,728	351,292	467,817
“ common	779,744	622,777	286,928	163,338	218,723
“ fancy and ornamental	23,858	16,829	1,790	387	835
“ sewer	12,490	33,321	18,638	3,683	5,992
Tile, drain	593,980	244,368	144,579	179,015	127,890
“ structural, roofing, and floor	848,556	378,193	169,824	74,064	120,696
Sewer pipe, copings, flue-linings, etc.	834,361	696,964	451,786	185,138	226,263
Pottery	89,384	73,860	67,866	52,650	52,578
Haydite	227,275	167,533	16,366	15,012	9,790
Total	5,221,214	3,552,799	1,690,505	1,024,579	1,230,584
GRAND TOTAL	113,678,170	97,569,429	86,479,164	109,819,557	144,126,032

(a) Cobalt in oxide, metallic cobalt, and cobalt content of residues marketed.

(b) Nickel in matte, oxide, and metallic nickel.

(c) Includes value of sulphuric acid produced.

(d) No deduction made for lime consumed in manufacturing.

Table III shows the aggregate value of metals from the time production began in Ontario, and of other minerals beginning with 1891. Since 1914 the statistics of annual production credit the Province only with the value of the pig iron made from Ontario ore. This is but a small part of the total output, since the great bulk of the iron ore charged to the blast furnaces of the Province is imported "lake" ore. In the production tables credit is taken only for ore shipped to points other than Ontario blast furnaces, since to include the value of domestic ore converted into pig iron in Ontario would involve a duplication of this item. No domestic iron ore has been produced since 1924.

TABLE III.—TOTAL MINERAL PRODUCTION OF ONTARIO

Year	Value of mineral production				
	Metallics	Non-metallics	Structural materials	Clay products	Total output (a)
Before 1891....	\$9,520,269		(a)		\$9,520,269
1891.....	388,715		\$4,316,958		4,705,673
1892.....	864,382		4,509,757		5,374,139
1893.....	614,762		5,505,991		6,120,753
1894.....	842,750		5,244,008		6,086,758
1895.....	616,055		4,554,083		5,170,138
1896.....	963,288		4,271,715		5,235,003
1897.....	1,038,089		4,480,452		5,518,541
1898.....	1,689,002		5,546,875		7,235,877
1899.....	2,055,592		6,361,081		8,416,673
1900.....	2,565,286		6,733,338		9,298,624
1901.....	5,016,734		6,814,352		11,831,086
1902.....	6,257,499		7,134,135		13,391,634
1903.....	5,242,575		7,628,018		12,870,593
1904.....	4,906,677		6,665,970		11,572,647
1905.....	10,201,010		7,653,286		17,854,296
1906.....	13,353,080		9,035,303		22,388,383
1907.....	14,550,835	\$3,020,537	\$3,876,275	\$3,571,726	25,019,373
1908.....	16,754,986	2,629,749	3,396,406	2,856,476	25,637,617
1909.....	22,928,496	2,825,751	4,028,206	3,198,922	32,981,375
1910.....	28,161,678	3,141,658	4,380,000	3,630,559	39,313,895
1911.....	29,102,867	3,674,926	4,935,609	4,263,395	41,976,797
1912.....	34,799,734	4,009,643	4,701,170	4,831,056	48,341,603
1913.....	37,507,935	4,296,450	5,866,775	5,561,151	53,232,311
1914.....	33,345,291	4,339,703	4,505,368	4,105,597	46,295,959
1915.....	44,109,769	4,655,250	3,609,371	1,871,379	54,245,679
1916.....	55,002,918	4,982,140	3,734,065	1,584,699	65,303,822
1917.....	56,831,857	7,702,942	4,962,284	2,596,749	72,093,832
1918.....	66,178,059	7,815,062	4,297,401	2,018,450	80,308,972
1919.....	41,590,759	6,308,182	7,208,413	3,776,562	58,883,916
1920 (b).....	49,657,828	8,141,796	11,921,019	4,735,154	74,355,797
1921.....	30,137,217	6,636,217	13,967,386	5,183,125	55,923,945
1922.....	40,498,778	7,591,913	13,640,166	6,944,218	68,675,075
1923.....	44,356,106	8,511,786	13,139,757	6,269,140	72,276,789
1924.....	52,327,063	7,555,283	12,398,465	5,137,865	77,418,676
1925.....	62,492,634	7,488,034	12,451,174	5,148,626	87,580,468
1926.....	59,217,702	7,842,632	12,681,308	5,356,469	85,098,210
1927.....	62,631,020	7,638,605	14,160,552	5,853,035	90,283,212
1928.....	71,269,813	7,822,641	14,815,814	6,177,664	100,085,933
1929.....	84,124,902	8,621,427	18,541,687	6,830,162	118,118,178
1930.....	83,393,067	8,492,263	16,571,626	5,221,214	113,678,170
1931.....	74,378,766	7,642,308	11,995,556	3,552,799	97,569,429
1932.....	70,130,845	7,361,897	7,295,917	1,690,505	86,479,164
1933.....	95,364,365	7,094,636	6,335,977	1,024,579	109,819,557
1934.....	127,427,151	7,201,700	8,266,597	1,230,554	144,125,139
Total.....	1,554,408,117		633,406,657		2,187,814,774

(a) No estimate has been made of the output of non-metallics prior to 1891.

(b) Beginning with 1920, exchange equalization on gold, also the increment of world price above old standard, have been included in the figures of metallics and total output.

In the following table the average monthly prices for gold, silver, and copper are given, and also the average for the year:—

1934	Gold, Canadian funds, \$ per fine oz.	Silver, cents per oz.		Copper, cents per lb.	
		New York market, U.S. funds	Montreal, Canadian funds	New York, export	Montreal, Canadian funds
January	33 05	44 188	44 4	7 831	9 295
February	35 29	45 233	45 6	7 844	9 340
March	35 08	45 875	46 0	7 837	8 893
April	34 93	45 180	45 1	8 053	8 967
May	34 94	44 226	44 1	7 913	8 822
June	34 73	45 173	44 8	7 705	8 579
July	34 59	46 310	45 8	7 146	7 989
August	34 19	48 986	47 9	6 885	7 641
September	34 18	49 484	48 2	6 586	7 297
October	34 27	52 375	51 3	6 315	7 125
November	34 16	54 255	53 0	6 513	7 264
December	34 57	54 390	53 7	6 619	7 428
Average (12 months)	34 50	47 973	47 5	7 271	8 220

Mining Company Incorporations.—Companies incorporated in 1934 having a stated capitalization numbered 212, and four of these had both stated capital and “No Par” shares. In addition a total of 76 companies were incorporated having shares without nominal or par value, exclusively. A summary of mining companies incorporated and licensed in Ontario for the last ten years is given hereunder:—

ONTARIO MINING COMPANIES INCORPORATED AND LICENSED, 1925-1934

Year	Incorporated				Extra-provincial and mortmain companies licensed	
	Stated capital		“No par” companies		No.	Capital for use in Ontario
	No.	Nominal capital	No.	Shares		
		\$				\$
1925	70	107,400,000	4	9,010,000	3	162,510
1926	145	165,655,750	28	22,386,500	6	4,850,000
1927	199	344,145,000	30	40,034,000	10	3,260,000
1928	211	495,575,000	28	30,778,400	17	7,208,500
1929	97	142,390,000	27	32,557,200	13	1,540,000
1930	37	23,234,600	20	16,808,909	6	5,525,000
1931	44	60,670,000	15	5,909,000	1	400,000
1932	43	58,766,000	12	5,844,000	0	.....
1933	95	158,365,000	21	23,165,000	8	1,290,000
1934	212	488,335,000	82	86,183,000	9	925,000

Under the provisions of The Ontario Companies Act, companies incorporated outside the Province are required to take out an Extra-Provincial license or License in Mortmain in Ontario and stipulate the amount of capital to be used in connection with mining enterprises where the land is situate within the Province.

Diamond-Drilling.—During the past two years diamond drilling in Ontario has been active. Sixteen companies were operating, and the statistics which follow cover fifteen of them and present a fairly complete picture. In 1933 there were 143 drills in use and employment given to 251 men who received \$375,236 in wages. The corresponding figures for 1934 were 265 drills, 503 men,

and \$733,114 in wages. Diamond-drilling operations afford an excellent yard-stick in appraising the general trend in mining development and prospecting. As these Ontario firms do considerable drilling in the neighbouring provinces, Quebec and Manitoba, and also much further afield, statistics covering the work done in these outside areas are also shown. It should, however, be pointed out that data for outside provinces may be incomplete. Statistics follow:—

Province	1933		1934	
	Holes	Core Footage	Holes	Core Footage
Ontario	No. 2,692	389,764	No. 3,724	643,112
Quebec	472	138,692	1,023	215,153
Manitoba	277	39,462	418	81,226
Saskatchewan and N.W.T....	4	798	33	5,791
	3,445	568,716 (107.7 miles)	5,198	945,282 (179 miles)

On the other hand consumption of diamonds used in drilling refers to footage drilled in all provinces in which work was reported, and is indicative of the trade available for diamond merchants as well as the amount of wear or wastage of these abrasives in our hard pre-Cambrian rocks. The total consumption of borts, ballas, and carbons, was 38,005.09 carats as noted below:—

CONSUMPTION OF DIAMONDS (CARATS) IN ONTARIO BY
REPORTING FIRMS IN 1934

Period	Borts	Ballas	Carbons
Diamonds on hand Dec. 31, 1933 Carats	10,402 79	76 61	3,100 90
Purchased in 1934 “	38,523 50	32 19	2,505 50
	48,926 29	108 80	5,606 40
Diamonds on hand Dec. 31, 1934 “	12,957 85	76 57	3,601 98
	35,968 44	32 23	2,004 42
Diamonds consumed (38,005.09). “			

Prospecting:—An index of activity is afforded by the following table:—

MINING CLAIMS RECORDED IN ONTARIO 1907 to 1934

1907..... 13,996	1917..... 1,936	1927... .. 15,554
1908..... 4,634	1918..... 1,534	1928... .. 15,046
1909..... 9,746	1919..... 2,918	1929..... 8,207
1910..... 5,792	1920..... 2,160	1930... .. 3,886
1911..... 9,001	1921..... 2,459	1931..... 5,779
1912..... 3,104	1922..... 5,686	1932..... 4,945
1913..... 4,320	1923..... 6,092	1933..... 8,077
1914..... 1,913	1924..... 5,222	1934..... 16,888
1915..... 2,519	1925..... 4,751	
1916..... 2,470	1926... .. 13,496	

It will be noted that 1934 was the most active year in the history of the Province as regards claim-staking. In the Port Arthur mining division alone 6,842 claims were recorded as a result of prospecting activity in the Little Long Lac and Sturgeon River gold areas which lie east of Lake Nipigon and are both close to the Canadian National railway.

Gold

At the old price of gold the record of production from all sources in Ontario during the period was \$1,024,918 below the figures for the corresponding period of the previous year. Taking the exchange equalization and world price into consideration, the production value in 1934 in Canadian funds was \$9,921,963 in excess of that for 1933, the total figures of value being \$70,966,914 as against \$61,044,951.

Referring to the gold mines separately, the year 1934 has shown marked improvement and while the ounces recovered in Ontario declined the quantity of ore treated has increased, moving up from 5,621,517 tons during 1933 to 6,504,835 tons in 1934 or an increase of 13.9 per cent. The performance indicates the increased milling facilities and also the ability of operators to treat much lower grade ore, thereby increasing the life of the mines and the communities now dependent on this industry. At Porcupine the average value per ton of ore treated at the Canadian price of gold was \$8.56, at Kirkland Lake \$17.18 per ton, in Matachewan \$6.13, and in Northwestern Ontario \$4.82 per ton, In this connection it is of interest to note that in the Transvaal the record for 1934 as compared with 1933 shows an increase in tonnage milled of nearly 8 per cent., but a decrease in grade from 5.844 to 5.150 dwt. per ton of ore or almost 12 per cent. During the period eight mines reported production from Porcupine, while four properties carried on small part-time operations. Ten were active in Kirkland Lake, three in Matachewan, and eighteen in Northwestern Ontario.

While the output from the northwestern portion of the Province was small and mainly produced by one mine, the Howey, it is of interest to record the reopening of many old properties which were producers in the nineties, and which are now being taken up again. In addition important new mines have recently come into production, e.g. Little Long Lac and others. The increased price of gold, modern milling methods, and improved transportation facilities have created considerable change in the outlook of the gold-mining industry in this area. When it is remembered that favourable gold formations are known to exist and that new finds are becoming general over a wide area, the developments in gold-mining in this part of the Province promise to be of considerable importance during the next few years.

In the late summer new finds were reported from the Sturgeon River area which is east of Lake Nipigon. A gold "rush" followed and hundreds of claims were staked and recorded, but it is too soon to estimate the importance of this new field. Very rich veins on the claims of the Sturgeon River Gold Mines have been found both on surface and by diamond drilling. Favourable developments at Little Long Lac mine, and also at the Central Patricia and Pickle-Crow mines near the Albany river, with continued interest at Red Lake, are an earnest of a revival of gold-mining in the northwestern part of Ontario. McKenzie Red Lake, the second producer at Red Lake, turned over its new 125-ton mill in February and will be in production in March, 1935.

The milling capacity in tons per day of idle and producing gold mines in Ontario at the end of 1934, and proposed expansions along with projected plants for 1935, are summarized as follows:—

GOLD MILLING PLANTS AT ONTARIO MINES IN 1934

Area and Mine	Tonnage idle	Tonnage operating	Proposed tonnage
KIRKLAND LAKE BELT:			
Canadian Reserve (Larder L.)	500		
Bidgood		100	
Kirkland Gold Belt			100
Toburn		100	
Sylvanite		325	
Wright-Hargreaves		1,000	
Lake Shore		2,325	
Teck-Hughes		1,325	
Kirkland Lake Gold		150	
Macassa		200	
Lucky Cross (Kirkland Gateway)	20		
Barry-Hollinger		100	
PORCUPINE BELT:			
Blue Quartz		25	
Croesus	25		
Lakeland	25		
Porcupine Peninsular (Night Hawk lake)	200		
Buffalo-Ankerite		350	
Dome		1,500	
Canusa		25	
Coniaurum		400	
Gillies Lake Porcupine			75
Hollinger		5,000	
Marbuan (March)		200	
McIntyre Porcupine		2,250	
Anglo-Huronian (Vipond)		300	
Paymaster Consolidated		200	
Hayden	40		
North Turnbull		15	
McLaren Porcupine		3	
MATACHEWAN AND SHINING TREE:			
Ashley		125	
Matachewan Consolidated		100	
Young-Davidson		500	
Churchhill			10
SUDBURY DISTRICT:			
McMillan		125	
Lebel Oro (Long lake)			200
Halcrow-Swayze		25	
MICHIPICOTEN AND GOUDREAU (Algoma district):			
Algold (New Goudreau)	50		
Minto		80	
Parkhill		100	
Algoma Summit		25	
THUNDER BAY DISTRICT:			
Northern Empire (Beardmore)		125	
Little Long Lac		200	
J. Bruce McMartin (Dik Dik-Atigogama L.)			10
St. Anthony (Sturgeon L.)		125	
Ardeen (Moss)		200	
North Shores (McKellar-Longworth)		25	
Tashota			50
PATRICIA:			
Howey (Red Lake)		1,100	
McKenzie Red Lake			200
J.M. Consolidated		30	
Central Patricia		50	+50
Pickle-Crow			100
Casey Summit (Birch Lake)		50	
KENORA AND RAINY RIVER DISTRICTS:			
Golden Star		5	
Saundary		5	
Foley Syndicate		5	
Total	860	18,893	795

YEARLY DIVIDENDS AND BONUSES PAID BY ONTARIO GOLD MINING COMPANIES, 1912-1934

Year	PORCUPINE					KIRKLAND LAKE					Total
	Hollinger*	Anglo-Huronian	Dome Minest†	McIntyre Porcupine	Coniaurum	Buffalo-Ankerite	Toburn	Lake Shore	Teck-Hughes	Wright-Hargreaves	Sylvanite
	\$		\$	\$	\$	\$	\$	\$	\$	\$	\$
1912..	270,000	Porcupine	.....	.....	.....	.....	Tough-	.....	.....	.....	.....
1913..	1,170,000	Crown	.....	.....	.....	.....	Oakes	.....	.....	.....	.....
1914..	1,170,000	240,000	.....	.....	Rea	.....	.....	.....	.....	.....	.....
1915..	1,560,000	240,000	400,000.00	.....	12,000.00	.....	132,875	.....	.....	.....	.....
1916..	3,286,000	240,000	800,000.00	.....	.....	.....	265,750	.....	.....	.....	.....
1917..	738,000	120,000	300,000.00	541,542.45	.....	.....	.....	.....	.....	.....	.....
1918..	1,230,000	.....	.....	543,042.45	.....	.....	.....	100,000	.....	.....	.....
1919..	1,722,000	.....	.....	364,028.30	.....	.....	.....	100,000	.....	.....	.....
1920..	2,214,000	.....	416,886.00	546,042.45	.....	.....	.....	80,000	.....	.....	.....
1921..	3,198,000	.....	478,947.75	546,042.45	.....	.....	.....	120,000	.....	.....	.....
1922..	3,198,000	.....	715,000.00	546,042.45	.....	.....	.....	80,000	.....	412,500	.....
1923..	3,198,000	.....	1,430,001.00	548,542.45	.....	.....	.....	160,000	.....	206,250	.....
1924..	3,198,000	.....	1,905,668.00	774,125.00	.....	.....	.....	380,000	.....	206,250	.....
1925..	4,378,800	.....	1,906,668.00	798,000.00	.....	.....	.....	600,000	.....	550,000	.....
1926..	5,805,600	Vipond	1,906,668.00	798,000.00	.....	.....	.....	1,000,000	474,714.40	893,750	.....
1927..	6,396,000	67,500	1,191,667.50	798,000.00	.....	.....	.....	1,400,000	713,571.60	1,237,500	.....
1928..	5,412,000	.....	953,334.00	798,000.00	.....	.....	.....	2,000,000	2,860,286.40	825,000	.....
1929..	3,198,000	.....	953,334.00	798,000.00	.....	.....	.....	2,000,000	2,866,286.40	.....	.....
1930..	3,444,000	.....	953,334.00	798,000.00	.....	.....	.....	3,000,000	2,872,286.40	.....	65,990
1931..	3,444,000	.....	953,334.00	798,000.00	Coniaurum	.....	.....	4,800,000	3,118,143.60	825,000	131,980
1932..	3,690,000	Anglo-	1,239,334.20	997,499.86	80,923.41	.....	.....	6,000,000	2,884,286.40	962,500	164,975
1933..	4,182,000	Huronian	1,716,001.20	1,496,254.57	.....	42,571.29	Toburn	6,000,000	2,884,286.40	1,512,500	164,975
1934†..	6,888,000	501,042	3,336,669.00	1,596,000.00	.....	89,371.77	148,000	7,000,000	2,643,929.20	3,025,000	824,875
Total.	72,990,400	1,408,542,21	557,847.15	14,085,162.43	92,923.41	113,943.06	546,625.35	35,020,000	21,317,790.80	10,656,250	1,352,795
											179,948,857.94

*Includes \$160,000 paid by the Acme in 1915, before amalgamation with the Hollinger. †Does not include repayment of capital of \$476,667 in 1922.
†In 1934 at Kirkland Lake, Macassa paid \$131,403.40, and Kirkland Lake Gold \$157,173.69. Howey in Patricia district paid \$500,000. The figures are included in the total for 1934.

PRODUCTION OF ONTARIO GOLD MINES, 1934

Area	Ore milled, tons	Gold Bullion Shipped				Total value (standard)*	Exchange adjustment	Value, Canadian funds
		Gold content		Silver content				
		oz.	\$(Standard)	oz.	\$	\$	\$	\$
PORCUPINE								
Anglo-Huronian (Vipond)	101,806	15,541 47	321,271	2,774	1,293	322,564	216,679	539,243
Buffalo-Ankerite	125,134	20,503 16	423,838	1,999	940	424,778	286,054	710,832
Coniaurum	138,114	28,435 54	587,815	4,209	1,977	589,792	389,364	979,156
Dome	547,600	206,157 67	4,261,657	18,939	8,712	4,270,369	2,737,056	7,007,425
Hollinger	1,900,490	434,257 14	8,976,892	108,827	52,595	9,029,487	4,987,770	14,017,257
Marbuan	26,030	3,304 35	68,307	298	147	68,454	44,968	113,422
McIntyre Porcupine	851,345	239,099 32	4,942,620	58,421	27,005	4,969,625	3,319,637	8,289,262
McLaren	50	9 86	204	2	1	205	134	339
Paymaster Consolidated	13,824	2,020 50	41,767	583	303	42,070	27,452	69,522
Miscellaneous	500	48 00	992	.....	.....	992	664	1,656
Amalgamated Goldfields	.....	19 02	393	8	4	397	266	663
Munro-Croesus	.....	298 54	6,171	24	13	6,184	4,283	10,467
Total	3,704,893	949,694 57	19,631,927	196,084	92,990	19,724,917	12,014,327	31,739,244
KIRKLAND LAKE								
Argonaut	12	54 00	1,116	18	9	1,125	747	1,872
Barry-Hollinger	33,445	4,399 52	90,946	409	193	91,139	60,937	152,076
Bigood	2,433	199 46	4,123	39	18	4,141	2,663	6,804
Kirkland Lake Gold	64,952	20,316 21	419,973	2,853	1,340	421,313	281,987	703,300
Lake Shore	836,023	472,768 05	9,772,982	101,501	47,614	9,820,596	6,522,028	16,342,624
Macassa	66,557	32,056 45	662,666	3,684	1,726	664,392	446,716	1,111,108
Moffat Hall	8,476	2,525 30	52,202	343	163	52,365	35,923	88,288
Sylvanite	111,767	50,336 63	1,040,552	8,298	3,770	1,044,322	532,448	1,576,770
Teck-Hughes	442,745	167,411 82	3,460,709	23,837	11,161	3,471,870	1,888,480	5,360,350
Toburn	36,230	20,400 69	421,720	4,874	2,311	424,031	284,088	708,119
Wright-Hargreaves	354,418	218,203 16	4,510,660	39,962	18,340	4,529,000	3,043,292	7,572,292
Miscellaneous	.....	372 83	7,707	33	15	7,722	5,156	12,878
Total	1,957,058	989,044 12	20,445,356	185,851	86,660	20,532,016	13,104,465	33,636,481
MATACHEWAN								
Ashley	43,532	13,181 48	272,485	2,023	941	273,426	183,425	456,851
Matatchewan Consolidated	4,680	679 39	14,044	100	52	14,096	9,472	23,568
Young-Davidson	51,842	3,878 11	80,168	1,399	728	80,896	53,615	134,511
Total	100,054	17,738 98	366,697	3,522	1,721	368,418	246,512	614,930

NORTHWESTERN ONTARIO									
Ardeen (Moss)	38,143	5,815 27	120,212	31,796	15,175	135,387	80,707	216,094	
Algoma Summit	421	143 80	2,972	14	7	2,979	1,947	4,926	
Casey Summit (†)	4,094	887 89	18,354	87	41	18,395	12,278	30,673	
Central Patricia	11,536	6,373 15	131,745	577	292	132,037	87,525	219,562	
Dikdik	230	1,082 00	22,367	644	309	22,676	14,962	37,638	
Dupont	25	64 99	1,343			1,343	899	2,242	
Foley	86	86 00	1,778			1,783	1,199	2,982	
Golden Star	260	76 13	1,574		5	1,585	1,063	2,648	
Howey	481,757	45,985 26	950,600	15,434	11	957,797	636,426	1,594,223	
J.M. Consolidated	3,443	1,019 09	21,067	621	359	21,426	13,963	35,389	
Little Long Lac	5,485	2,456 99	50,790	198	104	50,894	34,586	85,480	
Lebel-Oro (Long lake)	7	36 38	752	3	1	753	503	1,256	
McMillan	12,313	1,959 39	40,504	63	31	40,535	26,809	67,344	
Minto	22,189	4,912 20	101,544	144	66	101,610	67,691	169,301	
Northern Empire	22,507	5,662 57	117,056	860	416	117,472	78,175	195,647	
Parkhill	19,431	8,983 81	185,712	407	189	185,901	124,746	310,647	
Saundary Syndicate	13	12 62	261			261	174	435	
St. Anthony (ore, dump, tailings)	21,618	3,571 38	73,827	991	491	74,318	48,880	123,198	
Total	643,558	89,128 92	1,842,458	51,875	24,694	1,867,152	1,232,533	3,099,685	
Total for gold mines†	6,405,563	2,045,606 59	42,286,438	437,332	206,065	42,492,503	26,597,837	69,090,340	
MISCELLANEOUS									
Nickel-copper refining . . . . .	.....	60,369 95	1,247,957			.....	834,526	2,082,483	
In ores from Cobalt . . . . .	.....	4 53	94			.....	62	156	
Total . . . . .	.....	60,374 48	1,248,051			.....	834,588	2,082,639	
Total gold output** . . . . .	.....	2,105,981 07	43,534,489			.....	27,432,425	70,966,914	
CALENDAR YEAR 1933									
Porcupine	3,402 632	1,046,091 01	21,624,617	171,437	54,910	21,679,527	8,249,321	29,883,318	
Kirkland Lake	1,766,014	990,044 43	20,466,034	166,518	58,062	20,524,096	7,305,041	27,183,859	
Matatchewan	38,004	16,991 38	351,243	2,375	849	352,092	143,892	495,984	
Northwestern Ontario	414,867	65,403 83	1,352,017	68,296	23,046	1,375,063	495,309	1,870,372	
Miscellaneous . . . . .	.....	36,987 66	764,603			764,603	292,874	1,057,477	
Total gold output, 1933	5,621,517	2,155,518 .31	44,558,514			.....	16,486,437	61,044,951	

*This value is based on the old price of gold (\$20.671834 per fine ounce).

†According to mine officials the figures represent only the quantity of gold recovered and sold.

‡Includes silver recovered with gold. **From all sources, exclusive of silver.

VALUE OF TOTAL PRODUCTION (GOLD AT \$20.67, AND SILVER) BY MINES OF THE PORCUPINE BELT

Year	Hollinger	Dome	McIntyre	Vipond (a)	Coniaurum	Porcupine Crown and Northcrown	West Dome Lake (b)	Buffalo Ankerite (c)	Marbuan (March) (d)	Night Hawk Peninsular	Schu- macher	Pay- master	Rea and Newray
1910...	\$ 31,194	\$ 4,355	.....	.....	\$	\$	\$	\$	\$	\$	\$	\$	\$
1911...	6,000	4,277	.....	5,160	.....	.....	.....	.....	.....	.....	.....	.....	.....
1912...	909,181	737,499	77,657	16,259	.....	.....	.....	.....	.....	.....	.....	.....	.....
1913...	2,488,022	1,242,625	236,299	.....	.....	326,803	.....	.....	.....	.....	.....	.....	.....
1914...	2,719,355	1,059,238	549,166	73,628	.....	685,135	.....	.....	.....	.....	.....	.....	.....
1915...	4,206,015	1,530,287	750,812	246,053	.....	602,436	102,880	.....	.....	.....	48,236	.....	.....
1916...	5,073,401	2,153,820	1,218,073	176,686	.....	578,322	16,814	.....	.....	.....	225,301	.....	Rea { 18,858
1917...	4,261,938	1,480,174	1,710,204	209,738	.....	377,904	44,434	.....	.....	.....	198,605	.....	Rea { 125,255
1918...	5,752,371	82,127	1,578,444	82,868	.....	124,474	103,745	.....	.....	.....	92,842	.....	Rea { 1,447
1919...	6,722,266	1,290,301	1,978,014	.....	.....	.....	23,910	.....	.....	.....	.....	.....	Rea { 1,516
1920...	6,219,665	2,020,568	2,223,083	.....	.....	71,529	47,169	.....	.....	.....	.....	.....	.....
1921...	9,051,276	2,290,264	1,827,761	.....	.....	97,301	.....	.....	.....	.....	.....	.....	.....
1922...	12,274,114	4,178,936	2,021,811	.....	.....	7,943	.....	.....	.....	.....	.....	2,800	.....
1923...	10,446,412	4,374,144	2,550,129	23,876	.....	.....	.....	.....	.....	.....	.....	.....	.....
1924...	13,433,063	4,307,624	3,604,874	596,803	.....	.....	60,642	.....	.....	.....	.....	.....	.....
1925...	15,749,109	4,365,923	3,721,499	565,379	.....	.....	287,758	.....	.....	.....	.....	.....	.....
1926...	14,829,655	3,940,053	3,862,074	631,636	.....	.....	220,758	140,588	11,055	.....	.....	.....	.....
1927...	14,539,538	4,031,575	3,965,210	667,724	.....	.....	35,252	359,005	19,839	.....	.....	63,551	.....
1928...	10,706,235	3,915,051	4,201,808	604,426	220,534	.....	.....	289,960	133,879	166	.....	135,025	.....
1929...	9,455,290	3,590,537	4,295,491	820,667	635,485	.....	155,797	878	256,303	.....	.....	183,271	.....
1930...	10,260,950	774,943	4,696,578	909,414	738,941	.....	15,662	.....	306,262	.....	.....	.....	.....
1931...	10,097,975	3,512,066	4,756,880	564,291	751,352	.....	.....	.....	217,586	.....	.....	.....	.....
1932...	10,356,846	4,040,318	5,424,728	454,412	861,031	.....	.....	219,482	78,835	.....	.....	.....	.....
1933...	9,971,877	4,524,025	5,427,001	502,541	695,957	.....	.....	462,680	(d)	.....	.....	.....	.....
1934...	9,029,487	4,270,369	4,969,625	322,564	589,792	.....	.....	424,778	68,454	.....	.....	42,070	.....
Total...	198,591,235	63,721,099	65,647,221	7,564,125	4,493,092	2,871,847	1,114,821	1,969,055	1,092,213	566,885	564,984	426,717	147,076

(a) Changed to Anglo-Huronian, Limited, October 16, 1933.
 allow for a deduction of \$52,667 due to an erroneous return made in 1925.
 (b) Total value of bullion in 1927 was \$87,919. Figures shown in above table
 March was renamed the Marbuan in 1934; the Buffalo Ankerite operated the Marbuan mill in 1933, treating the dump of the New York Porcupine.
 (c) Formerly Ankerite, and renamed Buffalo Ankerite in 1932.
 (d) The

VALUE OF TOTAL PRODUCTION (GOLD AT \$20.67, AND SILVER) BY MINES OF THE PORCUPINE BELT—Continued

Year	Porcupine United	Davidson	Preston and Clifton	Scottish-Ontario	Porcupine Pet	Porphyry Hill	Gold Reef	Tommy Burns	De Santis	Hughes	Miscellaneous	Total value (Standard)
1910...	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
1911...												35,549
1912...												15,437
1913...												1,740,596
1914...						4,200						4,316,807
1915...					5,000							5,231,989
1916...					5,551	2,036	1,547					7,495,853
1917...												9,442,417
1918...		15,579					588	289				8,285,321
1919...		27,089										7,833,966
1920...		11,246										10,041,580
1921...												10,690,561
1922...												13,177,244
1923...												18,479,325
1924...											(e)	17,405,648
1925...												22,266,894
1926...												24,886,615
1927...									146	30		23,810,700
1928...											(f)	23,976,577
1929...											(g)	20,352,099
1930...	44,285											47,701
1931...	56,913											19,373,240
1932...	5,439											17,822,481
1933...											(h)	61,940
1934...											(i)	36,114
											(j)	19,941,703
											(k)	21,474,592
											(l)	38,940
											(m)	82,743
											(n)	21,679,527
											(o)	19,724,917
Total...	106,637	53,914	30,477	13,575	10,551	6,236	2,135	289	11,962	30	495,462	349,501,638

(e) Huddlestons & Cline. (f) Includes "high-grade" recovered from W. P. Wilson. (g) Blue Quartz. (h) Munro-Croesus, \$3,955; and miscellaneous, \$32,159. (j) Hayden, \$1,497; Munro-Croesus, \$5,722; J. Spence, \$2,515; and miscellaneous, \$29,206. (k) Treated in Hayden mill. (l) Hayden, \$2,516; New York Porcupine, \$3,164; and \$77,063 recovered mainly from scrapped machinery, of which J. M. McLaren is credited with \$326 on ore shipped to Noranda. (m) McLaren, \$205; Munro-Croesus, \$6,184; Blue Quartz, \$397; and miscellaneous, \$992.

VALUE OF TOTAL PRODUCTION (GOLD AT \$20.67, AND SILVER) BY MINES OF THE KIRKLAND LAKE BELT

Year	Lake Shore	Teck-Hughes	Wright-Hargreaves	Sylvanite	Kirkland Lake	Tough-Oaks Burnside	Barry Hollinger	Argonaut	Ashley	Macassa	Canadian Gold-fields	Lucky Cross	Ontario-Kirkland	Swastika and Trout Creek	Total value (b)
1913	\$	\$	\$ 1,127	\$	\$	\$ 66,632	\$	\$	\$	\$	\$	\$ 14,006	\$	\$ (c) 7,172	\$ 88,937
1914						117,644		5,204							122,848
1915						555,539									555,539
1916						711,625									711,625
1917						342,831									409,553
1918	416,414	80,570				139,683	(d) 10,114								646,781
1919	263,354	169,590			56,263			2,631							491,838
1920	503,735	247,757			286,901			26,863							1,065,256
1921	495,276	322,919	468,751		242,417			513							1,529,875
1922	471,341	596,495	762,753		224,396								10,082		2,172,548
1923	547,600	1,117,963	754,979		223,102										2,728,331
1924	1,098,572	1,023,025	1,088,725		46,512			72,512							3,456,453
1925	1,958,720	996,943	1,913,401					152,072							5,403,289
1926	2,775,000	1,601,209	2,150,844			263,064	56,978	214,183				Gold Hill			7,193,411
1927	3,375,033	2,781,962	2,151,916			309,709	86,263	143,387							9,703,843
1928	4,073,965	4,948,896	1,838,510			153,215	175,692	127,448				34,595 (e)			12,271,110
1929	6,090,189	5,048,420	1,734,728			82,316	111,767	32,430				17,700			(f) 14,089,233
1930	7,836,779	5,398,271	2,432,888				151,758	9,959							17,215,974
1931	11,065,618	6,093,199	2,909,837				217,835	1,891							(g) 1,622
1932	12,647,128	5,855,570	3,548,161				224,633								(h) 21,783,162
1933	10,364,835	4,558,181	3,672,529				160,697								(i) 23,829,480
1934	9,820,596	3,471,870	4,529,000				60,789								(j) 20,876,188
							91,139								(k) 20,900,434
Total	73,804,175	44,379,562	29,958,149	6,350,639	4,895,906	4,014,247	1,347,665	790,218	686,214	740,654	52,295	28,520	10,082	8,794	167,214,477

(a) Exclusive of copper values. (b) Standard. (c) Swastika. (d) Patricia mine, afterwards called Barry-Hollinger. (e) Samples shipped in 1923 and 1926 by the Gold Hill not heretofore reported. (f) Contains \$11,925 miscellaneous. (g) Trout Creek. (h) Includes Telluride in Stead tp., \$935 in 1931 and \$468 in 1932. (i) Kirkland Gateway in 1933. (j) Includes Atlas, \$175, White Rock, \$419, and from scrap machinery, \$5,546. (k) Includes Bidgood, \$4,141; Moffat Hall, \$52,365; Young-Davidson, \$80,896; Matachewan Consolidated, \$14,096; and miscellaneous, \$7,722.

GOLD OUTPUT BY CHIEF PRODUCING COUNTRIES AND STATES

Source	1929	1930	1931	1932	1933	1934*
	oz.	oz.	oz.	oz.	oz.	M. oz.
World.....	19,500,152	20,836,318	22,329,525	24,141,486	24,962,408	26,660
Transvaal (S. Africa)...	10,412,326	10,716,351	10,877,777	11,558,532	11,013,713	10,486
Russia (U.S.S.R.)....	1,085,384	1,433,665	1,700,960	1,990,085	2,489,375	3,734
Canada.....	1,928,308	2,107,073	2,693,892	3,051,676	2,949,309	2,970
Ontario.....	1,622,267	1,736,012	2,085,815	2,287,394	2,155,518	2,106
United States†.....	2,056,629	2,100,395	2,213,741	2,279,305	2,276,711	2,742
California.....	409,020	450,289	521,158	566,031	594,867	710
Alaska.....	374,669	407,356	466,006	433,193	457,274	541
S. Dakota.....	312,328	406,297	431,200	485,051	519,548	482
Oceania‡.....	584,859	621,936	783,934	994,655	1,152,471	.
Australia.....	421,476	462,164	590,423	707,412	819,927	854
West Australia.....	376,176	416,369	510,570	605,561	637,049	651
Mexico.....	651,873	671,871	628,468	584,487	637,727	660
S. Rhodesia.....	560,813	547,630	532,111	574,135	642,499	691

*Preliminary figures (thousands of ounces) from various sources, subject to revision.

†Exclusive of the Philippine Islands.

‡Includes Australia, Tasmania, New Zealand and New Guinea.

Maximum Canadian production..... 3,051,676 ounces in 1932.

Maximum U.S. production..... 4,887,604 ounces in 1915.

Maximum Transvaal production..... 11,558,532 ounces in 1932.

Maximum World production..... 26,660,000 ounces in 1934.

Exchange Equalization.—The figure for exchange equalization published for 1933, namely \$16,486,437, refers to the actual quantity of gold marketed during that period. Owing to the fact that in former years some mines reported only the exchange received during the calendar year and not exchange actually due on the year's gold shipments, some small corrections should be made for the years 1931 and 1932, as follows: In 1932, \$81,728.42 received in 1933 should be credited to 1932; at the same time \$113,088.91 should be deducted from the 1932 figures and credited to those for 1931. In 1930, the exchange did not overlap with 1931. The corrections have been applied in the accompanying table. Figures for 1933 and 1934, in addition to the exchange factor, represent the increment in the world price of gold over and above the old standard of \$20.67 per fine ounce. Details beginning with 1920, follow:—

EXCHANGE EQUALIZATION RECEIVED ON GOLD MARKETED BY ONTARIO PRODUCERS

Year	Porcupine	Kirkland Lake	Northwestern Ontario	Other areas	Grand total
	\$	\$	\$	\$	\$
1920.....	1,265,664.29	110,354.42	256.78	.....	1,376,275.49
1921.....	1,238,210.72	121,425.28	.....	.....	1,359,636.00
1922.....	189,022.11	19,590.77	.....	7.87	208,620.75
1923.....	241,602.00	37,844.00	.....	.....	279,446.00
1924.....	172,721.71	24,027.67	.....	.....	196,749.38
1925*.....	—2,607.00	—231.00	.....	.....	—2,838.00
1926*.....	.....	—595.48	.....	.....	—595.48
1927*.....	.....	—235.10	.....	.....	—235.10
1928.....	.....	2,810.55	.....	.....	2,810.55
1929.....	87,173.00	70,283.00	.....	.....	157,456.00
1930.....	20,911.63	15,790.69	.....	.....	36,702.32
1931.....	830,799.04	1,006,607.22	61,857.38	26,958.00	1,926,221.64
1932.....	2,815,381.21	3,106,487.10	211,630.04	329.66	6,133,828.01
1933.....	8,249,321.00	7,448,933.00	495,309.00	292,874.00	16,486,437.00
1934.....	12,014,327.00	13,104,465.00	1,479,045.00	834,588.00	27,432,425.00
Total ..	27,122,526.71	25,067,557.12	2,248,098.20	1,154,757.53	55,592,939.56

*Discounts paid during years when Canadian funds were at a premium. Figures for the three years have been deducted to arrive at the net totals.

Nickel-Copper

The nickel-copper industry during the past twelve months has made a remarkable recovery and may now be said to have regained the prosperity noted in 1929. The name nickel-copper so long used by the Department of Mines has become a misnomer since in point of quantity of metal recovered the copper far outstrips the nickel. In his note of November 15 to the shareholders, R. C. Stanley, President of the International Nickel Company of Canada, Limited, said in part:—

In extracting nickel and making it an important servant of industry, approximately two pounds of copper are recovered for every pound of nickel. This means that copper is now being mined at the rate of more than 200,000,000 pounds per year as the direct result of providing the nickel now required in diversified industrial markets throughout the world.

To refine its copper to the high degree of purity demanded by modern industry your company participated in the organization of the Ontario Refining Company, Limited, for the construction, as a custom refinery, of a modern electrolytic plant at Copper Cliff, Ontario. Your company now owns 90 per cent. of the capital stock of the Ontario Refining Company, Limited, and that refinery is now engaged exclusively in the production of "ORC" brand electrolytic copper from our company's blister copper.

An examination of the statistics presented indicates that ore smelted rose by 90 per cent., and bessemer matte produced by 96 per cent. as compared with 1933, and this is exclusive of the quantity of blister copper produced directly. Matte exported showed an increase of 8 per cent., while matte treated at Port Colborne was up by 68 per cent. Comparing the period under review with 1930, the year of highest production yet recorded, increases may be observed in the quantity of ore smelted and matte exported.

The recovery of this industrial group is also well illustrated in the record of wage-earners employed; in 1933 the total was 3,804 in mines, smelters and refineries, while in 1934 the pay roll rose to 5,948 or an increase of 56 per cent.

Late in 1934 at the Copper Cliff smelter construction of four new converters was completed. These added to the battery of eight, make 12 in all, which with the addition of other smelter units has resulted in a marked increase in capacity.

NICKEL-COPPER MINING AND SMELTING, 1930-1934

Schedule	1930	1931	1932	1933	1934
Ore shipped tons	2,115,139	1,690,192	790,614	1,533,887	2,903,310
Ore smelted "	2,357,154	1,689,874	793,552	1,523,814	2,896,959
Bessemer matte produced* "	166,703	100,213	41,660	82,128	161,177
Nickel content "	61,112	40,643	16,936	36,710	71,580
Copper content "	70,800	38,811	16,176	25,932	52,967
Matte exported† "	34,550	30,294	21,778	43,315	46,755
Nickel content "	20,978	16,847	8,068	20,811	28,771
Copper content "	5,855	6,620	8,825	12,323	6,692
Matte refined in Canada‡ "	139,635	69,215	**6,651	**42,209	**71,118

*In addition to the matte produced, the International Nickel Company produces blister copper directly, figures for which are not included here.

†All matte was exported prior to 1918 when refining in Canada began at Port Colborne, Ontario. The British America Nickel Corporation commenced refining operations at Deschenes, Quebec, in 1920, and closed down finally in July, 1924.

‡In 1932, after the reorganization of the metallurgical practice, the Orford process, i.e., the separation of the matte into copper tops and nickel bottoms, was carried out at Copper Cliff. The figures for 1932 and later do not include the matte so treated.

**These figures duplicate in part the figures for matte produced.

PRECIOUS METALS RECOVERED, 1930-1934

	1930*	1931	1932	1933	1934
	Ounces	Ounces	Ounces	Ounces	Ounces
Platinum metals:					
Platinum.....	34,000	44,725	27,284	24,746	116,177
Palladium.....	29,907	39,313	37,613	31,009	83,932
Rhodium, Ruthenium, Osmium and Iridium.....	4,133	7,605			
Total ounces	68,040	91,643	64,897	55,755	200,109
Value \$	2,436,683	2,812,834	1,998,911	1,501,233	6,187,992
Gold.....	22,867	23,381	22,675	36,983	60,370
Silver.....	1,067,154	822,971	663,795	1,026,370	1,882,293

*In 1930, 5 oz. gold, 62 silver, 4 platinum, and 14 palladium were included in ore exported from Strathly township.

Silver-Cobalt

A revival of activity has recently been observed in the old Cobalt camp, for many years so famous as a silver producer. Advancing prices for silver and a keener demand for cobalt ores indicate some measure of prosperity where the depression formerly was most keenly felt.

During the year twelve properties at Cobalt and one at Elk Lake made shipments totalling 2,899 tons. The properties, six of which were operated under lease, were as follows: Beaver, Cobalt Properties, Crown Reserve, Drummond lease, Dominion Reduction Company, Foster lease, Hudson Bay lease, Mining Corporation lease, McKinley-Darragh lease, Nipissing lease, O'Brien, and Timiskaming. The Miller Lake O'Brien shipped from Gowganda.

The price of silver on the New York market rose from 44.188 cents per ounce in January to 54.39 cents in December and averaged 47.973 cents for the twelve months. The monthly average in Canadian funds was 47.46 cents. Early in August the United States nationalized silver at 50.01 cents an ounce, that is the U.S. government decided to take over all floating silver in that country and to pay 50.01 cents per ounce for it, while newly mined silver was to be paid for at 64.5 cents. Later the Treasury Department at Washington announced its intention of issuing silver certificates against the purchase of silver on the basis of \$1.29 per ounce. An official announcement stated that the objective in view was a 25-75 silver-gold ratio, which would involve the purchase of about 1,350,000,000 ounces. This programme will doubtless require some years for completion.

This stabilizing of the price of silver in the United States definitely suspended the trading in silver in New York which had developed the world's largest market for that metal, and directly led to the organization in Canada of the Canadian Commodity Exchange for trading in spot and future contracts in silver with trading floor in Montreal. To this exchange the members of the Toronto Stock Exchange and The Montreal Stock Exchange were given equal privileges of membership.

The shipments of ores and concentrate from the Cobalt area in 1934 as reported by the T. & N.O. railway were 940.27 tons to Deloro; 210.5 tons to Trail, B.C.; 821.63 tons to Noranda; and 926.11 tons exported to other countries; or a total of 2,898.51 tons. In 1933, ore shipments as reported by the railway

were only 1,445.09 tons, and the increase is proportional to the revival in mining operations in this famous old silver camp.

SILVER SHIPMENTS BY CAMPS, 1904-1934

Year	Average price, cents per ounce (New York)	Silver content in troy ounces					Montreal R. and Maple Mountain, etc.
		Total from silver camps	Cobalt	Casey township	South Lorrain	Gowganda	
1904..	57.221	206,875	206,875	.....	.....	.....	
1905..	60.352	2,451,356	2,451,356	.....	.....	.....	
1906..	66.791	5,401,766	5,401,766	.....	.....	.....	
1907..	65.237	10,023,311	10,023,311	.....	.....	.....	
1908..	52.864	19,437,875	19,424,251	500	13,124	.....	
1909..	51.502	25,897,825	25,658,683	26,185	194,955	.....	18,002
1910..	53.486	30,645,181	29,849,981	92,544	221,133	471,688	9,835
1911..	53.340	31,507,791	29,989,893	114,789	933,912	468,687	510
1912..	60.835	30,243,859	28,605,940	253,824	834,119	549,976	.....
1913..	57.791	29,681,975	28,105,505	825,108	248,992	502,370	.....
1914..	54.811	25,162,841	24,155,699	499,643	108,199	399,300	.....
1915..	49.684	24,746,534	24,280,366	223,939	...	242,229	.....
1916..	65.661	19,915,090	19,008,517	445,900	77,280	383,393	.....
1917..	81.417	19,401,893	18,327,258	.....	10,000	1,064,635	.....
1918..	96.772	17,661,694	16,807,407	143,901	72,188	638,198	.....
1919..	111.122	11,214,317	10,314,689	171,278	4,586	723,764	.....
1920..	100.900	10,846,321	10,402,249	.....	8,253	433,352	(a) 2,467
1921..	62.654	8,261,931	7,673,535	1,101	328,886	258,292	117
1922..	67.528	10,711,127	9,239,147	1,028	1,284,307	170,651	(b) 15,994
1923..	64.873	10,377,846	7,259,858	.....	2,955,646	160,761	1,581
1924..	66.781	9,935,902	6,704,787	.....	2,633,058	598,057	.....
1925..	69.065	10,707,235	6,252,115	.....	3,099,964	1,355,156	.....
1926..	62.107	10,543,473	6,262,249	.....	3,044,584	1,236,640	.....
1927..	56.370	8,543,513	4,482,543	.....	2,319,356	1,741,614	.....
1928..	58.176	6,745,401	3,934,020	.....	1,133,952	1,677,429	.....
1929..	52.993	7,781,429	4,823,529	.....	876,006	2,081,894	.....
1930..	38.154	9,225,610	5,329,335	.....	1,754,989	2,141,234	(c) 52
1931..	28.700	5,998,482	3,706,880	.....	594,360	1,697,242	.....
1932..	27.892	4,659,304	3,262,380	.....	22,144	1,374,780	.....
1933..	34.727	3,641,930	2,397,118	.....	.....	1,244,812	.....
1934..	47.973	3,268,462	1,963,993	.....	.....	1,089,565	.....
Total.	...	424,848,149	376,305,235	2,799,740	22,773,993	22,705,719	48,558

(a) Includes 885 ounces from Silver Islet, Lake Superior.

(b) Silver Islet, Lake Superior.

(c) Nickel Hill Syndicate in the Sudbury area shipped silver-cobalt ore.

SILVER PRODUCTION, 1933 AND 1934

Source	1933		1934	
	Fine ounces	Value	Fine ounces	Value
Sales of bullion by the reduction companies, smelters and mines*.....	3,602,529	1,258,362	2,883,639	1,343,017
Contained in silver-cobalt concentrates and residues exported.....	100,642	41,480	86,017	42,608
Estimated as recovered from concentrates treated outside of Ontario....	236,863	87,922	298,906	145,990
In crude gold bullion.....	408,626	136,867	437,332	206,065
Recovered by nickel-copper refineries..	1,026,370	388,303	1,822,293	864,646
Total.....	5,375,030	1,912,934	5,528,187	2,602,326

*There is included with the 1933 figures, 800,000 ounces of bullion produced in 1931 but held in storage for future sale.

Output of cobalt as metal, in oxide, and contained in concentrate exported totalled 588,566 pounds valued at \$589,933 as against 466,702 pounds worth \$597,752 during 1933.

Associated with the silver of the Cobalt camp are the two metals, cobalt and nickel, mostly in the form of arsenides of the metals. The combination of nickel and arsenic, known as niccolite, has formerly been left as waste or thrown away. Recently a market for this material has developed, and towards the end of the period a carload was undergoing sampling at the Timiskaming Testing Laboratory, Cobalt. If this market should materialize and become steady several companies would benefit, e.g. Cobalt Properties (under Cobalt lake), Agaunico near North Cobalt, and the Drummond near Kerr lake.

Iron Ore, Pig Iron, Steel, and Coke

As shown in the following table, foreign ore charged amounted to 462,705 long tons, the average price of which was \$4.65 at lower lake ports. From this ore 271,725 long tons of pig iron were produced, including 177,361 of basic, 49,655 of foundry, and 44,709 of malleable. Figures for the past five years follow:—

IRON AND STEEL STATISTICS, 1930-1934

	1930	1931	1932	1933	1934
Foreign ore smelted long tons	935,005	568,886	198,063	182,060	462,705
Limestone for flux short tons	234,309	149,454	56,880	46,944	118,350
Coke " "	542,094	320,133	119,064	113,102	252,532
Pig iron produced long tons	534,542	318,645	113,665	110,562	271,725
Value of pig iron produced \$	11,465,435	6,363,101	2,558,799	2,066,049	6,249,675
Steel made long tons	639,128	444,107	244,693	258,841	476,699
Value of steel made \$	22,369,480	15,099,638	8,319,562	8,800,594	16,207,766

At Montreal No. 1 pig iron (2.25-2.75 silicon) was quoted at \$23.00, malleable at \$23.00, and steel billets at \$34.00 per long or gross ton.

Coke statistics for the past five years, as collected by the Dominion Bureau of Statistics, are shown in the following table:—

COKE STATISTICS, 1930-1934

Coke	1930	1931	1932	1933	1934
Production short tons	1,489,415	1,113,509	1,087,122	1,153,509	1,411,516
Imports " "	993,753	694,982	605,307	615,818	881,235
	2,483,168	1,808,491	1,692,429	1,799,024	2,292,751
Deduct exports " "	317	106			54
Apparent consumption " "	2,482,851	1,808,385	1,692,429	1,769,327	2,292,697

Chromite

The Chromium Mining and Smelting Corporation, Limited, in 1934, shipped 40 tons of chrome ore from the Obonga Lake deposits, west of Lake Nipigon, all of which was used for experimental purposes. From this material ferro-chrome was made in the electric furnaces of General Abrasives at Niagara Falls, N.Y.

The company estimated 1,100 tons of ore were mined from surface open cuts between June and December, and the material shipped was valued at \$12.00 per ton. Considerable diamond-drilling was carried out in 1934. An average of 16 men were employed at the mine, in addition to about 50 on road construction. Tractors will be used for conveying highgrade ore some 28 miles north to Collins station on the Canadian National railway.

Radium and Uranium

Although pitchblende, which is the source of radium and uranium, has not been produced in commercial quantities in Ontario, there is now a well-equipped extraction plant in successful operation at Port Hope, Ontario, owned by Eldorado Gold Mines, Limited, for the treatment of pitchblende concentrates from Great Bear lake, some 4,000 miles distant. The refinery was placed in commission in 1933, and considerably enlarged in the autumn of 1934. In January, 1935, the concentrator of the company, at Labine point, Great Bear lake, commenced operations. It has a capacity of 75 tons of ore daily. A 2-ton Bellanca air cruiser will be used to transport the silver-pitchblende concentrate, a distance of about 1,200 miles, to the railhead at Waterways, Alberta, thus ensuring a constant supply to the refinery during winter months.

The initial output of radium needles in 1933 (approximately 788 milligrams) was purchased by the Ontario Government for use in cancer clinics in four of the larger cities. An economic extraction process was perfected in 1933 for both radium and uranium products. The chemical process employed is intricate and will not be described here. Recovery of radium is in the form of a readily soluble bromide and less soluble sulphate, the latter being used for hospital work. Special care is taken at all stages to prevent the loss of radium by emanation and to protect the workers by fan ventilation.

Uranium yellow and orange (two sodium salt pigments) are produced for use in porcelain manufacture. Europe is the chief market for these pigments. The black oxide of uranium is produced also. Satisfactory arrangements for marketing both radium and uranium products were completed in 1934. This is a most creditable Canadian performance, as heretofore radium production was practically a Belgian monopoly. The Department of Mines, Ottawa, reports production in 1934 as 6.1 grams of radium from 61 tons of concentrates, uranium compounds totalling 60,000 pounds, and 30,500 ounces of silver as a by-product. Henceforth, with the production of high-grade concentrates at the mine, the grade shipped will, it is expected, be considerably enhanced.

NON-METALLICS

With the exception of arsenic, mica, mineral waters, salt and talc, every non-metallic mineral showed an increase, and salt actually increased in quantity although the selling value was lower. As these minerals are consumed in a wide list of manufacturing industries, the record of increases even though small in some cases, are indicative of a definite recovery in the industrial life of the country. The total value of the non-metallic group in 1934 was \$7,201,700 as against \$7,094,636 in 1933 or a slight increase. The details of quantities and values marketed may be observed in the main table on page 4.

Barite

A small output of barite was reported in 1933, after being absent from the list since 1923. Several deposits of this mineral are known to exist in the Province. Although considerable investigation has been undertaken regarding markets, and several enquiries have been received from outside sources, no steady development work was underway at any of the Ontario deposits. Canada Night Hawk Mines which is equipped for milling, did not report any work. Deposits in Yarrow township and at Tionaga were idle, and no shipments were reported.

Diatomite

Several deposits of this mineral have been under development for a number of years in Muskoka but the production to date has been small. In 1934 shipments totalling 44 tons, having a value of \$1,760, were reported, as against 28 tons worth \$1,298 in 1933.

Feldspar and Nepheline Syenite

Feldspar.—Production rose from 4,387 tons in 1953 to 6,335 tons in the period under review. The revival reflects the increased consumption of ground spar in domestic manufacturing plants and is a positive indication that a distinct business revival has been made in the enamelling, glazing, and porcelain insulator manufacturing trades.

As exports to the United States are practically non-existent this increase in the output of feldspar while small in actual money value is of signal importance, showing as it does the industrial recovery now apparent. The only domestic grinding plant in Ontario is that of the Frontenac Floor and Wall Tile Company, at Kingston, which draws its supply of crude spar from Lanark county mainly. The Ontario spar is particularly rich in potash and alumina.

Nepheline Syenite.—The Nepheline Company, Limited, was incorporated in Ontario on August 10, 1934, with a capital of \$100,000. Headquarters are at Lakefield and it is the purpose of Wm. Morrison, the promoter, and associates, to develop a deposit of nepheline syenite at Mountain lake in Methuen township, Peterborough county. This particular rock has a chemical composition which makes it suitable for use in the glass industry. The combined alkalies, soda and potash, run about 15 per cent. Low silica and high alumina content give this rock a low fusion or fluxing point. Markets have been canvassed in the United States, while in England some members of the Glass Manufacturers' Federation have reported satisfactory tests and are prospective buyers, provided the price is right. It is proposed to quarry the rock, crush to 20-mesh, transport by truck to Stony lake, ship by barge to Lakefield, and thence by rail. Other deposits of nepheline syenite occur in Eastern Ontario, and some are being investigated.

Fluorspar

While Ontario's production of this mineral is insignificant and is drawn from old mine dumps near Madoc in Hastings county the output increased from 73 tons in 1933 to 150 tons in 1934. The material which is consumed at smelters as a flux and in various chemical industries has a ready sale, since some foreign spar is imported. Consumption, however, is not large.

Graphite

There is only one producer in Ontario, namely, the Black Donald Graphite Co., Limited, with its mine on lots 16, 17 and 18, concession III, Brougham township, Renfrew county, near the village of Calabogie. The total value of the production in 1934 was \$64,998 as against \$16,145 in the preceding year. A new feature in the development of the graphite industry in Ontario is its successful application to the manufacture of leads for pencils. In this connection the following excerpt from the *Financial Post*, January 12, 1935, is of interest:

Overcoming the chief obstacle to the use of Canadian graphite, in the making of lead pencils, the Dixon Pencil Co., Limited, of Newmarket, Ont., states that for the first time in history, Canadian graphite from the well-known Black Donald mines at Calabogie is now being used by that company. Canadian graphite has always been noted for its strength, high grade and true intensity of color, but owing to its texture, it could not successfully be employed in pencil lead making, as ordinary methods of refining and pulverizing would not prepare the Canadian graphite in workable form for pencil leads. Now, however, the technical staff of the Dixon Pencil Company has successfully devised a patented process called "impact pulverizing," license for which is held exclusively by this company. The result, it is claimed, is a stronger, smoother, writing lead of true black color. The company states that it hopes to extend the use of this graphite not only to the market of Canada but to the markets of the world, thereby increasing the demand for Canadian graphite.

Gypsum

The output of gypsum in Ontario rose from 24,460 tons in 1933 to 33,234 in 1934, and came from two companies: Gypsum Lime and Alabastine Canada, Limited, with plant at Caledonia, and the Canadian Gypsum Company at Hagersville. The increase of about 26 per cent. in quantity coincides with the general revival in the building industry of Ontario.

Sales in 1933 fell to a very low ebb, as will be noted in the table which follows:

GYPSUM SALES, 1930-1934

Grade	1930	1931	1932	1933	1934
Crushed.....tons	25,130	10,263	5,656	2,753	5,636
Fine ground....."	1,190	451	364	795	376
Calcined sold....."	3,515	1,606	217	165	226
Calcined used in products....."	65,111	41,038	29,418	20,747	26,996
Total sold or used.....tons	94,946	53,358	35,655	24,460	33,234
Total value.....\$	776,069	374,469	186,176	112,319	141,389
Number of workers	*92	155	*98	*79	
Wages paid \$	92,918	87,263	85,036	46,782	

*Exclusive of wage earners employed in the manufacturing division of the Caledonia plant.

Iron Pyrites and Sulphuric Acid

The sulphur content of the acid manufactured at Copper Cliff by Canadian Industries, Limited from sulphur fumes derived from nickel-copper smelting was 14,598 tons worth \$145,980, as against 8,196 tons valued at \$81,960 in 1933. No pyrite ore was shipped.

Mica

The mica industry, which is principally in the hands of small producers, is almost entirely dependent on the electrical manufacturing business. The decline in consumption was particularly marked in 1932 and there were fewer producers than during the past two decades. By grades the shipments in 1932, 1933, and 1934 were as follows:—

Grade	1932		1933		1934	
	Quantity	Value	Quantity	Value	Quantity	Value
	lb.	\$	lb.	\$	lb.	\$
Ground and rough.....			19,000	239	2,459	514
Thumb-trimmed.....	232	224	44,219	3,287	30,315	3,094
Splittings and knife-trimmed.....			11	19	303	110
Scrap.....	536,980	2,528	1,268,200	5,820	1,203,225	5,341
Total	537,212	2,752	1,331,430	9,371	1,236,302	9,059

Mineral Waters

The output in Ontario from five or six mineral springs during the past decade has ranged from 21,775 to 309,000 Imperial gallons. During 1931 six wells, all in eastern Ontario, produced 197,540 Imperial gallons worth \$8,578 at the shipping point, and in 1932 four wells produced 61,208 gallons. In 1933, the production was 29,794 gallons valued at \$2,347 from three wells, and in 1934, 21,775 gallons worth \$1,622.

Natural Gas and Petroleum

The Natural Gas Commissioner of Ontario supplied the following notes:—

Natural Gas.—The production of natural gas in the year 1934 was 7,327,474 M. cu. ft., and the value \$4,396,484, a small increase over 1933. An annual increase of 150,000 M. cubic feet is so small that it is difficult to attribute it to any particular reason, unless it is to slightly reduced rates in the cities in Essex, Kent and Lambton. Certainly there has been a considerable increase in the sale of more efficient appliances which would stimulate the demand for gas. The past year has been a successful one in the search for gas. A new field was discovered in Bayham township, Elgin county, east of the village of Eden. The De Clute field in Raleigh township and the Dover field in Dover township, Kent county, have been extended. In each of these fields several large wells were drilled, and this has helped to maintain public interest in the development of natural gas fields.

Petroleum.—The year 1933 has shown an increase in petroleum production for the fourth consecutive year, as noted in the table. This new production came from the Bothwell field and from Brooke township in Lambton county where sixteen wells were drilled in the past year. At Bothwell old wells were opened that have not been operated for 20 or 30 years, and an extension of the Bothwell field was discovered south of the Thames river. This oil is all from the Onondaga formation at about 500 feet from surface.

CRUDE PETROLEUM PRODUCTION,* 1930-1934

Field	1930	1931	1932	1933	1934
	Barrels	Barrels	Barrels	Barrels	Barrels
Petrolia and Enniskillen township...	55,130	57,515	58,871	57,298	55,924
Oil Springs.....	29,160	30,792	31,438	31,343	29,862
Moore township.....	1,576	3,739	3,272	2,192	2,962
Sarnia township.....	1,149	1,466	1,227	2,181	3,244
Plympton township.....	296	296	274	211	201
Bothwell.....	21,176	18,084	19,460	22,935	32,132
Dover township.....	457	891	453	763	558
Dawn township.....			5,061	8,589	4,169
Onondaga township.....	231	34	543	946	600
Mosa township.....	7,166	8,517	8,429	8,168	9,030
Thamesville.....	447	462	534	847	614
Dunwich township (Dutton and Iona)	365	628	781	346	283
Tilbury East township.....	149				
Raleigh township.....				239	264
Brooke.....					1,535
Total quantity.....	117,302	122,364	130,343	136,058	141,384
Value.....	\$235,746	\$219,993	\$247,468	\$253,486	\$299,874
Average price per barrel	\$2.00	\$1.80	\$1.89	\$1.87	\$2.12

*Information furnished by the Imperial Oil Refiners, Limited, of Sarnia, and others.

Quartz, Quartzite, and Silica Brick

The production of quartz and quartzite which in 1933 was below that of previous years, showed a marked recovery in 1934. Silica brick advanced in 1933 over the preceding year, and increased its gain in 1934. Production figures for the past five years follow:—

QUARTZ, QUARTZITE, AND SILICA BRICK, 1930-1934

Schedule	1930	1931	1932	1933	1934
Rock sold or used tons	167,487	97,888	66,135	66,562	89,167
Value \$	274,674	148,642	93,574	86,146	133,069
Silica brick sold or used M	378	279	93	183	452
Value \$	19,120	13,702	4,303	7,351	22,053
Total, value \$	293,794	162,344	97,877	93,497	155,122

Salt

During 1934 six companies produced salt, or brine which is used in the manufacture of chemicals by Canadian Industries, Limited, and Brunner Mond Canada, Limited. The Warwick Pure Salt Company was a newcomer on the list in 1933, and Kincardine Salt Limited, owned by Canadian Industries, Limited, reported no production. This industry, which is located in the southwestern part of the Province, is well organized, and the fluctuations shown in the figures of output reflect fairly closely the general progress of industry in the Province. Production figures covering a 5-year period follow:—

SALT SOLD OR USED, 1930-1934

Schedule	1930	1931	1932	1933	1934
Table and dairy tons	49,467	115,180	59,620	61,231	69,779
Fine "	52,604		59,036	63,786	67,777
Coarse "	21,085		15,673	14,086	14,730
Land "	245		557	283	347
Other grades (pressed blocks)* . . . "	7,655				
Total salt tons	131,056	133,371	134,896	139,386	152,633
Brine (salt equivalent) "	114,737	97,928	96,242	104,721	124,118
Total sold or used tons	245,793	231,299	231,138	244,107	276,751
Value \$	1,568,250	1,760,388	1,789,752	1,755,087	1,734,196

*Pressed blocks included with Table and dairy grade after 1930.

The Walker Salt Corporation, Limited, of London, Ont., has drilled a salt well 1,485 feet deep at Port Franks in Lambton county. This company has completed the foundations of the salt plant and ordered the machinery for open pan production early in 1935. This grade of salt is particularly suited for dairy use, and will supply the local market. The Goderich Salt Company is putting in a triple effect vacuum pan evaporation which is expected will operate early in 1935. An important feature is, that for the first time all the machinery in connection with this plant has been manufactured in Canada. Formerly all salt-making machinery was imported from the United States. This will give a capacity equal to the Sandwich plant.

Talc

A fairly stable market has been developed for this mineral, both in the ground and prepared condition. The domestic consumption is steady, and exports are made to the United States and Europe. The production record as reported by two companies at Madoc in Hastings county for the last five years follows:—

TALC STATISTICS, 1930-1934

Sales	1930	1931	1932	1933	1934
Quantity marketed..... tons	11,664	11,806	12,064	15,114	13,934
Value..... \$	133,213	122,044	111,585	142,134	135,978

Increased talc sales in 1933 were due partly to the gradual betterment in some lines of business using talc products, such as textiles, cosmetics, etc. Some of the buying, however, may have arisen from the fear of possible higher prices, which would account for the falling off in the demand during 1934.

STRUCTURAL MATERIALS

Building Permits.—In 61 Canadian cities building permits in 1934 were valued at \$27,457,524. Of this total 30 Ontario cities accounted for \$14,351,380, as noted in the following table abstracted from *Annual Review of Building Permits in Canada in 1934*, issued by the Dominion Bureau of Statistics, Department of Trade and Commerce, Ottawa:—

BUILDING PERMITS IN ONTARIO, 1920-1934

Year	30 Ontario cities, value	Wholesale Prices Index (a)	Toronto metropolitan area, value (b)	Wages Index	
	\$		\$	(c)	(d)
1920.....	58,636,365	144 0 (e)	30,049,413	180.9	.....
1921.....	59,315,845	122.8	31,979,346	170.5	.....
1922.....	81,396,259	108 7	36,405,625	162.5	.....
1923.....	74,673,080	111.9	39,530,877	166.4	.....
1924.....	57,330,141	106 6	29,636,428	169.1	.....
1925.....	59,888,867	102.9	32,408,636	170.4	.....
1926.....	65,373,757	100.0	31,588,124	172.1	100 0
1927.....	79,883,344	96 1	37,316,511	179.3	96 1
1928.....	104,777,566	97 4	59,817,568	185.6	97 4
1929.....	95,055,827	99.0	57,522,927	197.5	99 0
1930.....	69,042,946	90.8	38,371,587	203.2	90 8
1931.....	44,371,578	81.9	27,950,136	195 7	81 9
1932.....	16,887,761	77.2	9,461,050	178.2	77 2
1933.....	9,116,743	78.3	5,114,351	158 0	78 3
1934... ..	14,351,380	83 0	8,396,775	154 8	83 0

(a) Applies to average index numbers for Canadian wholesale prices of building materials on the basis of 1926=100, as compiled by the Dominion Bureau of Statistics. In 1913 the index was 67.0, dropping to a low of 60.5 in 1915.

(b) Includes York and East York municipalities.

(c) Average index numbers of wages in Canadian building trades as compiled by the Federal Department of Labour on the basis of 1913=100. (d) Basis of 1926=100. (e) Peak year.

Construction Contracts.—The value of Canadian construction contracts awarded for 1934, reported by *McLean Building Review*, was \$125,811,500 as compared with \$97,289,800 in 1933. Ontario contracts in 1934 amounted to \$63,358,300, or 50.4 per cent. of the total. Prices of materials were considerably

below the peak of 1920, and decided drops were recorded in 1930, 1931, and 1932, recovering perceptibly in 1934. Canadian construction contracts in 1933 were on a par with the war years, 1916-18, dropping below the \$10,000,000 mark. Figures by class follow for a five-year period:—

VALUE OF ONTARIO CONSTRUCTION CONTRACTS, 1930-1934

Classification	1930	1931	1932	1933	1934
	\$	\$	\$	\$	\$
Residential.....	44,427,000	39,274,300	14,143,200	12,653,800	17,578,600
Business.....	52,636,400	28,819,400	16,925,600	9,716,100	15,795,600
Industrial.....	12,787,400	6,836,300	1,871,000	4,699,700	4,305,200
Engineering.....	65,608,800	50,522,300	16,352,000	15,503,800	25,678,900
Total.....	175,459,600	125,452,300	49,291,800	42,573,400	63,358,300

Cement

Ontario's production of cement came from four plants: Belleville, Lakefield, and Port Colborne of the Canada Cement Company, and the St. Marys plant owned by the company of the same name.

Production during the past decade is given in the following table:—

PORTLAND CEMENT STATISTICS, 1925-1934

Year	No. of Operating Plants	Sales		
		Barrels (350 lb.)	Total Value	Average Price per bbl.
			\$	\$
1925.....	4	3,462,358	5,253,911	1 52
1926.....	3	3,398,860	4,792,857	1 41
1927.....	4	3,751,786	5,144,326	1 34
1928.....	4	3,911,795	5,520,897	1 41
1929.....	4	4,624,712	6,608,246	1 43
1930.....	4	3,942,690	5,779,404	1 47
1931.....	4	3,470,056	5,006,826	1 44
1932.....	4	1,599,342	2,288,975	1 44
1933.....	3	1,095,845	1,587,812	1 45
1934.....	4	1,702,128	2,403,590	1 41

The cement industry and the building and construction trades are inter-dependent. This is well illustrated by the annual report of the president of the Canada Cement Company for the fiscal year ending November 30, 1934. He says in part:—

Referring more particularly to the building industry, in which you are vitally interested, some progress has been made, but less progress than in the majority of other lines of business. In no other important country is this industry at so low a point relatively as in Canada. It will be recalled, however, that the building industry in Canada was one of the industries that was late in feeling the effects of the depression and it is, therefore, probably natural that its revival should lag. The improvement which took place during the year is indicated by the building permits, which increased 34 per cent. over 1933, a substantial improvement as expressed in percentages, but bearing in mind the extremely low volume of 1933, the volume increase is not of great proportions. It should be said that the Public Works programme of the Federal Government will not be reflected in demand for materials in substantial quantities until 1935.

Your Company's business showed an increase in volume of sales during the year in line with the somewhat better conditions prevailing in the building industry. We might state that the total consumption of cement in Canada was on a very restricted scale. While improvement was made over the 1933 volume, the total sales were disappointing when compared with normal years.

It is difficult to make a forecast for the coming year, but, from information gained from various sources at your Company's command, we are inclined to believe that improvement in the building industry will be slow for the immediate future. Nevertheless, the year should show some improvement over that of 1934.

Lime

Lime is used quite extensively for chemical purposes in addition to being an ingredient of mortar and sand-lime brick. During the period 19 companies and individuals operating 22 plants reported sales which totalled 190,495 tons valued at \$1,533,444 as against 146,193 tons worth \$1,227,196 in 1933. Sales during the past five years follow:—

LIME STATISTICS, 1930-1934

Year	Lime marketed or used						Fuel costs	Wage-earners	Wages
	Hydrated			Quicklime					
	Tons	Value		Tons	Value				
		Total	Per ton		Total	Per ton			
		\$	\$		\$	\$	\$		\$
1930..	42,726	504,178	11.80	209,340	1,673,409	7.99	343,237	330	352,768
1931..	34,284	379,996	11.08	113,267	841,194	7.43	177,310	287	216,337
1932..	23,518	255,223	10.85	143,185	1,018,007	7.11	204,546	203	154,361
1933..	19,733	220,291	11.16	126,460	1,006,905	7.96	188,317	210	111,637
1934..	22,280	249,026	11.18	168,215	1,284,418	7.63	..	....	..

Sand and Gravel

Preliminary figures for the year 1934 show a marked rise in the quantity of sand and gravel produced, but the selling value did not increase proportionally. The figures, however, are encouraging, reflecting as they do a greatly increased consumption by a revived construction industry.

Statistics for the past two years follow:—

OUTPUT OF SAND AND GRAVEL, 1933, 1934

Source	1933		1934	
	Tons	Value	Tons	Value
		\$		\$
Private pit operators.....	2,429,042	1,145,316	496,376	254,494
Dredged from Great Lakes and rivers.....	243,633	135,352	464,507	292,467
Department of Northern Development.....	1,038,108	207,624	4,345,695	869,139
Department of Highways.....	408,700	204,350	600,000	300,000
Miscellaneous counties and townships*.....	1,550,547	775,274	*1,550,547	775,000
Railways for ballast.....	..	..	297,964	49,314
Total.....	6,670,030	2,467,916	7,755,089	2,530,688

*Figures for 1933 used as an estimate for 1934.

Sand-Lime Products

The past three years have been dull for marketing sand-lime brick. This is in part due to a depressed construction industry, but competition of other

products such as cinder blocks and kindred materials has cut into this trade considerably. Four companies were active in the Toronto metropolitan area, and in addition to brick produced sand-lime building blocks, ready mixed mortar, and plaster. These items have been included in the main table under the title "sand-lime products," and the selling value as a result shows a decided increase. It should be pointed out therefore that, prior to 1934, the figures of value refer to sand-lime brick only. The selling value in 1934 was \$145,155 as against \$69,785 in the previous year.

Stone

The output of stone: limestone, trap, granite and sandstone, in 1934, was almost double that for 1933 in quantity, while the proportional increase in value was not quite so great. A partially revived building industry and a larger highway construction programme were instrumental in re-opening many quarries.

A new feature in the stone production industry was the inclusion of slate, which has been absent from the list of building materials for several decades. A slate quarry situated in the N.W. corner of lot 5, concession VI, Madoc township, was worked 50 years ago and supplied roofing slates for a few buildings in different towns of eastern Ontario. It was re-opened in 1934. There is a potential market for roofing shingles, blackboards, granules, and slate flour. The new operator is Ontario Slate Mines, Limited. An initial shipment of 120 tons of granules was made during the period.

STATISTICS OF STONE OUTPUT, 1932-1934

Variety	1932		1933		1934*	
	Tons	Value	Tons	Value	Tons	Value
Limestone and marble	1,827,858	\$ 1,459,224	1,225,754	\$ 931,501	2,056,788	\$ 1,533,287
Trap	36,915	52,659	17,201	26,629	43,622	59,266
Granite	36,357	133,698	2,449	12,804	27,227	32,072
Sandstone	4,008	9,435	8,889	12,334	10,104	28,459
Slate	. . .	. . .			120	600
Total	1,905,138	1,655,016	1,253,907	983,268	2,137,861	1,653,684

*Preliminary, subject to revision.

Clay Products

Refractory Clays.—The following information has been furnished by W. S. Dyer, Geologist of the Ontario Department of Mines, who visited the Hilder deposit during the past summer:—

It is well known that fire clay and sedimentary clay exist in the Moose River basin in Northern Ontario. Deposits that are near the railway, like the grey and black fire clays of the Onakawana lignite field, are covered under 50 to 100 feet of glacial debris and would have to be mined by underground methods. Deposits under shallow over-burden, like the highly refractory white and mottled clays of the Missinaibi river are 30 miles across the muskeg from a railway.

The only development at present in operation is known as the Hilder deposit, now being investigated by Minefinders, Limited. It is located on the west side of the Matagami river, 7 miles north of Smoky falls, the terminus of a 50-mile logging railway from Kapuskasing. The work to date has indicated that a good body of clay rises above the water level of the Mattagami river and is overlain by overburden of about 35 feet. Last summer (1934) Minefinders, Limited, built a road into the property, erected camps, took in a shovel with 1½ cu. yds. capacity, and completed an open cut 350 feet by 150 feet. In the bottom of the open cut, which is 25 to 30 feet in depth, Cretaceous refractory clay and silica sand are exposed.

Heavy Clay Products.—The following table shows in detail the quantities and values of the several kinds of clay products made and sold by Ontario producers:—

HEAVY CLAY PRODUCTS MARKETED, 1934

Kind	Number or quantity	Value
		\$
Fire-clay blocks and shapes.....		
Brick—Soft-mud process {face..... M	4,576,505	87,252
{common..... "	7,234,116	100,587
Stiff-mud (wire cut) process {face..... "	13,562,542	279,797
{common..... "	6,138,165	84,959
Dry-press {face..... "	4,714,405	100,768
{common..... "	2,046,158	33,177
Fancy or ornamental brick (including special shapes, embossed and enamelled brick)..... "	14,277	835
Sewer..... "	307,147	5,992
Tile, structural: Hollow blocks (including fireproofing and load-bearing tile)..... tons	13,563	101,958
Roofing tile..... No.	44,115	1,852
Floor tile (quarries)..... sq. feet	77,604	16,886
Tile, drain..... No.	5,460,333	127,890
Sewer pipe (including copings, flue linings, etc.).....		226,263
Pottery (flower pots) from domestic clay.....		52,578
Haydite.....		9,790
Total value.....		1,230,584

The value of clay products marketed for the last pre-war year (1913), for the year of maximum output (1922), and for the past five years is given below:—

VALUE OF CLAY PRODUCTS SOLD OR USED, 1913, 1922, AND 1930-1934

Year	Brick		Pottery	Drain tile	Sewer pipe	Haydite	Total
	Common	Pressed, fancy, building tile, etc.					
	\$	\$	\$	\$	\$	\$	\$
1913.....	3,283,894	1,162,860	52,875	292,767	600,297		5,392,693
1922.....	2,614,120	2,899,205	88,889	368,180	973,824		6,944,218
1930.....	792,234	2,683,983	89,381	593,980	834,361	227,275	5,221,214
1931.....	662,777	1,707,297	73,860	244,368	696,694	167,533	3,552,799
1932.....	305,566	704,342	67,866	144,579	451,786	16,366	1,690,505
1933.....	167,021	425,743	*52,740	179,015	185,048	15,012	1,024,579
1934.....	218,723	595,340	52,578	127,890	226,263	9,790	1,230,584

*Includes fire-clay blocks and shapes worth \$90.

