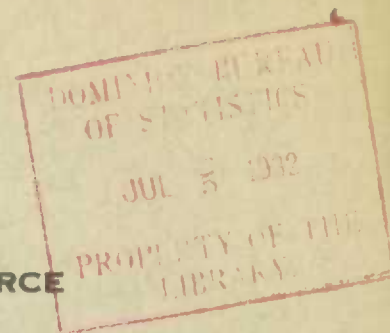


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**CANADA**  
**DEPARTMENT OF TRADE AND COMMERCE**  
**DOMINION BUREAU OF STATISTICS**

**SUMMARY REVIEW**  
**OF**  
**THE GOLD MINING INDUSTRY**  
**IN**  
**CANADA**  
**1931**

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In order to meet maturing obligations abroad the Canadian government took steps to purchase the gold production of the larger Canadian mines and after October, 1931, exports of gold from Canada were permitted only under licence.



Table showing the amount paid in Canadian dollars for one United States dollar by months, 1930 and 1931.

Months	1 9 3 0	1 9 3 1
January .....	1.01345	1.0020
February .....	1.00599	1.0002
March .....	1.00209	1.0002
April .....	1.00043	1.0004
May .....	1.00172	1.0005
June .....	1.000	1.0026
July .....	0.99914	1.00321
August .....	0.99901	1.00304
September .....	0.99838	1.04293
October .....	0.99889	1.12370
November .....	0.99891	1.12342
December .....	1.0023	1.21048

IMPORTS INTO CANADA AND EXPORTS OF GOLD, 1930  
and 1931.

	1 9 3 0	1 9 3 1
	\$	\$
<u>IMPORTS --</u>		
Coins and bullion --		
Coins, British, Canadian and foreign gold coins....	38,414,506	1,646,990
Gold bullion in bars, blocks, ingots, drops, sheets or plates, unmanufactured .....	705,782	391,003
Total .....	39,120,288	2,037,993
Gold, other, including gold fringe, leaf, sweepings, electro-plated ware, medals and manufactures,n.o.p.	1,231,531	714,335
<u>EXPORTS --</u>		
Coin and bullion --		
Gold coin --		
Canadian .....	750	920
Foreign .....	18,004,160	37,439,464
Gold bullion --		
Canadian .....	...	31,887,899
Foreign .....	...	...
Total - Canadian .....	750	31,888,819
Foreign .....	18,004,160	37,439,464
Total coin and fine gold bullion .....	18,004,910	69,328,283
Gold-bearing quartz, dust, nuggets and crude bullion obtained direct from mining operations .....	22,312,605	17,682,563
Jewellers' sweepings (gold, silver and platinum)....	380,379	234,276
TOTAL .....	22,692,984	17,916,839

Canadian auriferous quartz mines producing and shipping bullion in Canada received \$1,894,049 in premium payments during 1931.

UNION OF SOUTH AFRICA - On November 31, 1931, the gold producers committee of the Transvaal Chamber of Mines, submitted to a special general meeting of the Chamber a statement showing the great benefits that would accrue to the gold mining industry, more particularly in the working of low grade ore, should South Africa leave the present gold standard and devalue its currency. The views of the committee were endorsed by the Chamber and were thereupon communicated to the government. All gold mining companies, members of the Transvaal Chamber of Mines, which are incorporated in the Union of South Africa, informed their share and debenture holders early in December that any dividends declared as at December 31, 1931, would be declared in Union of South Africa currency; that dividend warrants dispatched from the London offices would be drawn in English currency calculated at the rate of exchange ruling on the date the dividends were payable from the head office in Johannesburg; and that share warrant coupons would be payable from the London and Paris offices on the same basis, irrespective of dates of presentation of coupons.

The following data pertaining to Crown Mines Ltd. may prove of interest to the Canadian gold producers. In 1931 there were produced 986,328 fine ounces as compared with 934,854 ounces in 1930; working costs per ton of ore milled are given at 15s. 7.2d. in 1914 and 19s. 9.2d. in 1931. Working costs per fine ounce of gold produced were 62s. 10.2d. in 1931 and 50s. 4.8d. in 1914. The yield per ton milled during 1931 was 6.290 dwts. and in 1914, 6.191 dwts. Total reserves now amount to 12,997,390 tons having an average value of 6.7 dwts. of which 10,578,940 tons valued at 6.53 dwts. are available for stoping. Development in 1931 cost 42s. 9d. per foot as compared with 45s. 5d. in 1930.

GOLD PRODUCTION OF THE WORLD, in fine ounces, 1930 and 1931

	1930	1931
Union of South Africa .....	10,716,351	10,877,777
Canada .....	2,102,068	2,693,892
United States .....	2,100,395	2,191,881
Russia and Siberia .....	1,100,000	1,100,000(e)
Mexico .....	671,871	623,003
Australia .....	465,269	588,960
Rhodesia .....	555,140	541,447
Japan .....	356,048	400,000(e)
India .....	329,232	330,000(e)
British West Africa .....	249,483	235,000(e)
Belgian Congo .....	210,261	240,000
Philippine Islands .....	185,208	174,000
New Zealand .....	122,532	130,000
Brazil .....	96,750	96,000(e)
Other countries .....	1,032,551	1,112,827
TOTAL .....	20,293,159	21,334,787

(e) Estimated.

## PRODUCTION OF GOLD IN CANADA BY PROVINCES AND BY SOURCES, 1930 and 1931.

PRODUCTION OF GOLD IN CANADA BY PROVINCES AND BY COUNTIES, 1930 AND 1931.				
	1930		1931	
	Fine ounces	Value \$	Fine ounces	Value \$
<u>NOVA SCOTIA</u> -				
In gold bullion .....	1,272	26,295	460	9,509
<u>QUEBEC</u> -				
In blister copper, in ores shipped and in gold bullion .....	141,747	2,930,170	300,075	6,203,101
<u>ONTARIO</u> -				
Porcupine area:- In gold bullion.....	858,603	17,748,899	961,567	19,877,353
In slags exported.....	481	9,943	685	14,160
Kirkland Lake In gold bullion .....	830,293	17,163,679	1,050,964	21,725,353
area:- In concentrates and				
slags exported.....	440	9,096	413	8,538
Sudbury area .....	23,803	492,051	23,381	483,328
Miscellaneous .....	22,392	462,884	48,804	1,008,868
TOTAL .....	1,736,012	35,886,552	2,085,814	43,117,600
<u>MANITOBA</u> -				
In gold bullion ores shipped and in blister copper .....	23,189	479,359	102,969	2,128,558
<u>ALBERTA</u> -				
In alluvial gold .....	...	...	195	4,031
<u>BRITISH COLUMBIA</u> -				
In alluvial gold .....	7,164	148,093	13,741	284,052
In gold bullion .....	31,177	644,486	37,233	769,674
In blister copper .....	25,799	533,313	26,364	544,992
In base bullion and in matte and ores exported .....	100,191	2,071,131	82,731	1,710,202
TOTAL .....	164,331	3,397,023	160,069	3,308,920
<u>YUKON</u> -				
In alluvial gold .....	35,160	726,822	44,061	910,822
In ores exported .....	357	7,380	249	5,147
TOTAL .....	35,517	734,202	44,310	915,969
TOTAL FOR CANADA .....	2,102,068	43,453,601	2,693,892	55,687,688



THE ALLUVIAL GOLD MINING INDUSTRY IN CANADA

Alluvial gold mining is carried on principally in the Yukon Territory and in British Columbia; placer gold was recovered as early as 1823 from the gravels of the Chaudiere river in Quebec; prospecting has been rather active in this district during recent years and in 1931 alluvial gold was produced in Beauce. This is the first recorded placer gold output from Quebec for several years.

The Gold Commissioner of the Yukon Territory reports that for the fiscal year ending March 31, 1932, the amount of placer gold mined during the year on which royalty export tax was paid was 54,152 ounces, royalty paid amounted to \$20,307. Fine gold equivalent to 44,061 ounces represented the placer output of the Territory for 1931 as compiled from returns supplied by the revenue division of the Department of the Interior. The Gold Commissioner reports that the Yukon Consolidated Gold Corporation Ltd., operated five dredges in 1931. Gold was recovered from the gravels on or near Bear, Bonanza and Dominion creeks; hydraulic operations were conducted on Crofton and Lovett Hills. Cubic yardage removed by hydraulicizing totalled 564,003 and ground dredged amounted to 4,139,290 cubic yards. This company employed an average of 250 men from April 1 to November 30th.

Many individuals and miners working in partnership were engaged in placer mining throughout the Territory and experienced a successful season. The dredge working in the glacier district and operated by the Holbrook Dredging Company Ltd., was in operation from June 15th to November 15th, the number of cubic yards dredged was 196,665 and the amount thawed 10,000.

Gold production in Alberta is compiled from returns supplied by the Royal Mint and represents recoveries of metal obtained in alluvial workings. During the year plans were advanced by the McLeod River Mining Corporation for the construction and operation of a gold dredge on McLeod river. Recoverable values in these gravels are stated to run from 17 cents to 29.8 cents per cubic yard.

Small quantities of crude gold were reported as having been recovered in 1931 from the Saskatchewan river sands; this metal was obtained through the efforts of individual operators.

Total gold production from Alberta from 1887 to 1931 inclusive totalled 15,224 fine ounces valued at \$314,710.

British Columbia alluvial gold operations yielded 17,176 ounces of crude gold as compared with 8,955 ounces in 1930; 127 miles of ditches were reported and 1,587,271 cubic yards of material were handled. Values were obtained from both bench and stream workings, the latter including beach and bar gravels. Mining operations were carried on both underground and on the surface. Metal recoveries by surface mining were obtained by sluicing, rocking and panning; equipment employed included monitors, drag line scrapers, tractors and rockers. Ocean beach sands treated on the shore of Graham Island resulted in the recovery of a small amount of crude gold. In the Stikine mining division on the north fork of the Clearwater river the Barrington interests have successfully completed the installation of a Risdon, New Zealand type, 1500 cubic yards per day rated capacity dredge. This was expected to commence operations at the opening of the 1932 season. In the Liard mining division on Dease Creek a hole drilled 160 feet to bed rock is reported to reveal values of 46.75 cents to the cubic yard; several operators were active on this creek during the year. Placer mining was very active in the Atlin area, good recoveries have been made and encouraging results attained. Discoveries and development in the older sections of District 2, which includes Cariboo, Omineca and Quesnel mining divisions, were the most important of recent years and encourage high hopes for the future and it is stated by the British Columbia Department

of Mines that, in the Quesnel mining division, it is clearly becoming more evident that the older placer sections contain much commercially recoverable gold. Numerous unemployed men operated along the edges of the Tulameen and Similkameen rivers resulting in the recovery of many odd lots of gold and platinum.

SUMMARY STATISTICS OF ALLUVIAL GOLD MINING IN CANADA, 1930 and 1931.

	British Colum- bia and Yukon	British Columbia	Yukon(a)
	1930(a)	1931	1931
Number of firms and individual operators(x) ....	79	105	4
Time in operation - months .....	6.8	6.8	6.8
Capital employed .....	\$ 5,881,620	1,881,891	4,026,110
Number of employees .....	394	165	172
Salaries and wages paid .....	\$ 612,369	235,924	447,011
Fuel and electricity used .....	\$ 8,272	20,906	20,839
Electricity generated:-			
(a) for own use .....	K.W.H. 11,696,500	...	11,387,391
(b) for sale .....	K.W.H. 2,834,200	...	2,424,909
Value of electricity sold .....	\$ 28,342	...	24,249
Crude gold recovered .....	crude ounces 52,905	17,176	55,315
Platinum recovered .....	crude ounces 17	50	...
Value of platinum recovered .....	\$ 771	1,783	...
Quantity of material handled .....	cu. yds. 3,783,981	1,587,271	4,914,638
Length of ditches .....	miles.. 226	127	123
Total value of alluvial products .....	\$ 877,778	293,775	932,766

(a) Includes data relating to one property in Quebec.

(x) In addition to the number shown in the table, there were several other small operators from whom no returns were obtainable.

THE AURIFEROUS QUARTZ MINING INDUSTRY.

In 1931 returns were received from 69 Canadian auriferous quartz mines, 42 of these produced bullion or shipped ores while 27 were engaged only in exploration or development. Producing mines in this group yielded 2,170,923 fine ounces of gold in bullion while ores shipped from these properties contained 60,849 fine ounces; minor amounts of the precious metal were contained in slags, etc.

NOVA SCOTIA - Fine gold contained in bullion shipped from gold mines in Nova Scotia to the Royal Mint, Ottawa, during 1931 totalled 460 ounces. Two properties were reported as producing and two were active on development. The Fiske Block, Malaga Barrens, Queens county, and the Renfrew mine in Hants county produced crude gold bullion. Diamond drilling of the King Fissure in Queens county was carried on by the United Goldfields of Nova Scotia Ltd., and gold arsenical concentrates were produced at the Boston Richardson in Guysboro county. There were, in 1927, one hundred known localities in Nova Scotia where gold had been found in situ; of these 55 were classed as gold districts. The recorded gold production of Nova Scotia from 1862 to 1931 inclusive amounts to 924,208 fine ounces valued at \$19,105,157.

QUEBEC - There were in the province of Quebec in 1931 four auriferous quartz mines producing and eleven under development or exploration. These mines showed an output of 47,446 ounces of fine gold contained in crude bullion and 938 ounces in ores shipped. Siscoe Gold Mines Ltd., located approximately 30 miles east of Rouyn, increased the capacity of their mill early in 1931 to 150 tons per day and through



improvements in milling practices reached a maximum capacity of 180 tons per day. In 1931 production was more than doubled over the previous year, partly due to increased tonnage of ore treated and in part to higher millheads. Average values are stated to run over \$13.00 a ton. Granada Gold Mines Ltd., located in the southwest corner of Rouyn township, was a steady producer throughout the year; an official statement issued in October 1931 stated that a very considerable tonnage of ore had been blocked out and proven. The Cadillac O'Brien in Cadillac township operated continuously and made shipments of high grade ore. In Barraute the Consolidated Venus Gold Mines produced for the first time.

Prospecting and development work actively carried out throughout 1931 in the new gold area of Pascalis-Louvencourt townships in Abitibi has given very encouraging results. It has been decided to erect mining and milling plants on the large low grade gold deposits of the Beattie claims in Duparquet township. Nipissing Mines Co. Ltd. and Ventures Ltd. are associated in the development of this property; it is stated that over 3,500,000 tons of ore averaging \$3.50 per ton have been indicated by diamond drilling. The Treadwell Yukon Company states that, while it was not possible in 1931 to make a reliable estimate of the average value of mine run ore on their Bussiere prospect in the Pascalis district, the information available suggests a value of about \$10.00 per ton; approximately 10,000 feet of diamond drilling has been done on this property and a test milling plant will be installed. Veins are numerous and where exposed have an average width of 5 to 6 feet; gold is widely distributed but values appear to be rather erratic.

From 1877 to the end of 1931 the province of Quebec produced from all sources 334,548 fine ounces of gold valued at \$6,915,682. It is interesting to note that at the end of 1927 the total production for the province was only 41,997 fine ounces worth \$868,117. This pronounced increase represents the recent and rapid expansion in the mining of auriferous ores in Quebec, especially does it reflect the successful development of the Noranda and other new mines in the northwestern part of the province.

ONTARIO - Twenty auriferous quartz properties in Ontario were reported as producing in 1931. Ten others were active in exploration or development work.

The mines of the Porcupine camp produced 962,252 fine ounces valued at \$19,891,513, those of the Kirkland Lake area, 1,051,377 fine ounces worth \$21,733,891, and auriferous quartz mines in other parts of the province, 48,804 ounces with a valuation of \$1,008,868. In Porcupine the Hollinger mill operated at from sixty-five to seventy-five per cent capacity, practically without interruption throughout the year, twelve levels are being opened up from the 2,750 to the 3,950, satisfactory ore has been encountered in all; it is confidently expected that the ore bodies will persist below the 3,950 level. So far the value per ton below the 2,000 foot was \$6.43. During the year the ore milled from below the 2,000 foot level was 402,724 tons equal to 24.6 per cent. The new Dome mill (all cyanide) operated throughout the year and an amalgamation unit was added. At the McIntyre the recently constructed 2,000 ton mill reached capacity during the latter part of the year. The Porcupine United closed down in March; the Croesus mine in Munro township was re-opened in October and a 50 ton mill is being installed at the Hayden Gold Mines located in Deloro and Ogden townships. Contaurum, Vipond and March Gold were all active producers throughout the year.

In Kirkland Lake, mining and development were continuous on the properties of the more important producers. Lake Shore Mines Ltd. report that during the fiscal year ending June 30, 1931, 698,624 tons of ore were milled and \$9,152,935 in bullion produced. The company reports a total cost per ton of ore mined and milled at \$6.680 including depreciation, etc. A large amount of development work at this property

resulted in a very substantial increase in blocked-out ore reserves. Kirkland Lake Gold Mining Company continued to sink from the 4,300 to the 4,750 foot levels and in doing this, as well as in continuing exploration above the 4,300 foot level, have opened up several shoots of ore in the porphyry and associated rocks. This property is now mining at the greatest depths in Canada. Teck-Hughes Gold Mines Ltd. state that for the fiscal year ending August 31, 1931, 396,200 tons of ore were treated and bullion amounting to \$5,973,120 or \$15.08 per ton recovered; the company report a cost per ton of ore treated at \$6.06 including depreciation and a cost per ounce of gold produced at \$8.305. Milling operations by May 1st were placed on a scale of 1,300 tons per day. The technical estimate of the "positive ore" reserve at September 1st, 1931, is as follows: broken ore, 313,691 tons average grade \$14.41; blocked ore, 331,693 tons average grade \$14.15. In January 1931, the Toburn Gold Mines Ltd., was formed to take title to an option upon the Tough-Oakes-Burnside gold property; exploration and development carried on at this property throughout the year aggregated 8,897 feet of drifting, crosscutting, etc., and 1,250 feet of diamond drilling. The company reports the finding of good ore between the Sylvanite eastern boundary and the "N-S" dyke on the Tough-Oakes. The Lake Shore after a year's experimental work, installed a 200 ton flotation unit in its mill and in addition this company, in conjunction with Wright-Hargreaves, has under construction a \$250,000 tailings recovery plant. During the year the concentrating plant of the Telluride Gold Mines in Skead township was destroyed by fire. Sylvanite Gold Mines was a steady producer in 1931.

In the Red Lake district of northwestern Ontario the Howey mine produced steadily during 1931. Prospecting for gold was widespread throughout the northern parts of the province. Promising discoveries were reported in the Bannockburn area where development of the Ashley mine is approaching production condition; construction on a 150 ton daily capacity mill will commence in the spring and the plant should be in profitable operation late in 1932. Gold discoveries were made in the Chester-Three Duck Lake area, southwest of Gogama on the C.N.R. and in the Swayze area, 40 miles west of Chester. In the Michipicoten district the Parkhill and Minto gold mines produced bullion, and at the Moss mine, west of Fort William, construction was commenced on a 200 ton gold mill.

Production of gold in Ontario from all sources from 1887 to 1931, inclusive, totalled 16,947,136 fine ounces valued at \$350,328,386.

MANITOBA - Manitoba reported three auriferous quartz mines as producing and two under development. Output of gold bullion produced amounted to 25,902 fine ounces and 51 ounces were contained in ores and concentrates shipped. The Central Manitoba mine in the Beresford Lake section of eastern Manitoba is the largest producer of auriferous quartz ores in Manitoba. Operations at the property were continuous during 1931. The Kiskoba mine, situated at Herb Lake, shipped auriferous quartz ore to the Trail smelter in British Columbia; the San Antonio in the Rice Lake area, eastern Manitoba, carried on mine development, mill construction and diamond drilling preparatory to entering the producing stage. Interesting discoveries of quartz gold ores were made in 1931 at Island Lake, northeastern Manitoba; options were acquired by prominent mining companies and preparations made to explore these occurrences by diamond drilling. The first shipment of gold was made from the Gem Lake mine in 1931; this property which has been under development during recent years is situated close to the eastern provincial boundary and almost west of the active mining district of Red Lake in Ontario.

The total recorded gold production from all sources in Manitoba as from 1917 to 1931 inclusive, amounts to 75,696 fine ounces valued at \$1,564,774; a distinct increase occurred in 1931 owing to the increasing production of auriferous blister copper at the new Flin Flon plant of the Hudson Bay Mining and Smelting Company Ltd.



BRITISH COLUMBIA - British Columbia auriferous quartz producers totalled 13 in 1931. Two mines were under development; 37,233 fine ounces were recovered in gold bullion produced at auriferous quartz mines while 60,673 fine ounces were contained in gold ores exported for treatment in foreign smelters. Lesser quantities were contained in ores and slags shipped to Canadian plants.

In the Northwestern District (1), which includes Portland Canal mining division, potential gold resources are becoming increasingly apparent and a marked interest in the discovery of gold areas is being displayed. Attention is also being directed to possibilities for profitable gold production from properties with small tonnage possibilities. Operations at the Premier were continuous and some new ore-bodies lateral to the main zone were discovered between the 2 and 3 levels; a 100 ton concentrator was completed at the Big Missouri to test the reliability of mine sampling. This mill treated 24,846 tons of ore, the mining of this tonnage proved that the high grade areas indicated by the preliminary work and drill holes were very limited in area; the holdings are very large and surface prospecting may indicate a more favourable condition on other sections of the claims.

In the Cariboo mining division, the Cariboo Gold Quartz Mining Company Ltd. carried out important exploratory work on their property and it is stated that the mine undoubtedly exhibits promise. Operations at the Pioneer in the Bridge River area, Lillooet mining division, were eminently satisfactory from development and production viewpoints; an average grade of \$20 has been maintained in the heads to the mill and development is well ahead of milling requirements. The vein on the 8th level has now been proved for a distance of 1,860 feet; work on a new three compartment shaft is being hastened.

The Dawson Gold Mines Ltd., operating the old Emancipation mine in the Yale mining division, continued small scale operations and the old mill was reconditioned and placed in operation for treatment of selected ore from the mine. In the Grand Forks mining division, operations at the Union Mine were considerable and additions to the mill were necessary owing to the encountering of a new type of ore. The Hedley Gold Mining Company closed down the Nickel Plate mine in the Osoyoos mining division owing to shortage of pay ore; some diamond drilling was done. Alexandria Gold Mines Ltd., situated on Phillips Arm, was under development practically all year; the lowest or beach tunnel at this mine was driven some 550 feet following a pyritized quartz vein for about 350 feet; it is reported that the results obtained in exploration were very encouraging. Production at the Reno Gold Mines in the Nelson division was steadily maintained in 1931 and satisfactory results attended the development work; the Second Relief on Erie creek was closed pending re-organization of the directorate, the mill operated for six weeks during the summer.

Production of gold from all sources in British Columbia from 1858 to 1931 totals 10,390,874 fine ounces valued at \$214,798,467.

YUKON - Development work was continued on the "Lone Star" group of claims on Victoria Gulch. Fifty-two car samples taken from crosscutting and raising averaged \$3.17 per ton. There is now reported a sufficient tonnage developed to supply a pilot mill.

In the Carmacks district one hundred and twenty-one quartz grants were issued and there has been considerable prospecting and development work carried on during the year. Five quartz claims were staked in the Liard district early in the spring.

The output of gold in the Yukon from 1885 to 1931 inclusive, amounts to 8,929,955 fine ounces worth \$184,598,203.



PRINCIPAL STATISTICS OF THE AURIFEROUS QUARTZ MINING INDUSTRY IN CANADA, 1927 - 1931.

Year	No. of active opera- tors	No. of opera- ting plants or mines	Capital employed \$	Number of em- ployees	Salaries and wages \$	Cost of fuel and elec- tricity \$	Net value of bullion, ore, concentrates, or residues shipped from mines \$
1927 ...	72	76	118,381,468	8,022	12,935,719	2,222,085	37,452,995
1928 ...	98	100	147,693,710	9,066	14,615,990	2,554,657	36,655,330
1929 ...	80	85	135,166,105	8,660	14,258,733	2,579,481	37,275,986
1930 ...	54	56	119,758,057	8,401	14,034,620	2,364,103	39,771,739
1931 ...	68	69	109,933,164	9,636	16,467,165	2,700,326	49,108,966

ORES MINED AND MILLED, CRUDE BULLION RECOVERED AND CRUDE BULLION AND CONCENTRATES SHIPPED IN THE AURIFEROUS QUARTZ MINING INDUSTRY, 1930 and 1931.

	Nova Scotia, Quebec, Manitoba	Ontario	British Columbia	CANADA
<u>1930</u>				
Number of producing mines .....	8	20	9	37
Ore mined ..... tons	115,995	3,972,692	384,116	4,472,803
Ore milled ..... tons	91,838	3,946,590	268,441	4,306,869
Tailings retreated ..... tons	...	85	37,010	37,095
Concentrates produced ..... tons	...	10	19,444	19,454
Bullion recovered by amalgamation - crude ounces ....	25,877	33,592	1,156	60,625
Bullion recovered by cyanidation - crude ounces ....	47,817	2,179,302	48,007	2,275,126
Bullion shipped ..... crude ounces ....	63,304	2,213,302	49,163	2,325,769
Content of bullion shipped -				
Gold ..... fine ounces .....	40,224	1,711,155	31,177	1,782,556
Silver ..... fine ounces .....	4,375	293,440	2,593	300,408
Value ..... \$	832,557	35,480,663	621,554	36,934,774
Exchange premium ..... \$	5	36,702	...	36,707
Net value of ores, slags and residues sold ..... \$	8,013	22,922	2,769,323	2,800,258
TOTAL VALUE OF ALL SHIPMENTS ..... \$	840,575	35,540,287	3,390,877	39,771,739
<u>1931</u>				
Number of producing mines .....	9	20	13	42
Ore mined ..... tons	150,366	5,041,002	374,058	5,565,426
Ore milled ..... tons	128,736	5,025,018	296,822	5,450,576
Tailings retreated ..... tons	122	...	22,064	22,250
Concentrates produced ..... tons	182	4	22,064	22,250
Bullion recovered by amalgamation - crude ounces ...	49,061	586	4,420	54,067
Bullion recovered by cyanidation - crude ounces ...	29,412	2,675,538	38,130	2,742,880
Bullion shipped ..... crude ounces ...	112,559	2,635,344	42,571	2,790,474
Content of bullion shipped -				
Gold ..... fine ounces ....	73,488	2,058,292	37,513	2,169,293
Silver ..... fine ounces ....	6,946	356,845	6,843	370,634
Value ..... \$	1,521,112	42,649,757	769,868	44,940,737
Exchange premium ..... \$	72,583	1,784,956	36,510	1,894,049
Net value of ores, slags and residues sold ..... \$	19,800	56,137	2,198,453	2,274,390
TOTAL VALUE OF ALL SHIPMENTS ..... \$	1,613,495	44,490,640	3,004,831	49,108,966

THE COPPER-GOLD-SILVER MINING INDUSTRY

The copper-gold-silver mining industry comprises a group of mines producing ores in which copper is usually the predominating metal in both value and quantity. The precious metals in these ores, especially during periods of depressed base metal prices, are often very deciding factors in the economic working of some mines of this type.

In northwestern Manitoba and in the Rouyn district of Quebec, important ore deposits of copper-gold sulphide ores, some of which contain zinc in commercial quantities, have been successfully developed and mined during recent years.

QUEBEC - In Quebec during 1931 the Consolidated Copper and Sulphur Company continuously operated the Eustis mines in the township of Ascot, producing both copper and iron sulphide concentrates. The copper concentrates were shipped to the United States. Owing to adverse conditions in the copper market the amount of copper produced at the Noranda mines in Rouyn was reduced but the gold production was more than doubled. Two discoveries at the mine during 1931 which favourably affected ore reserves were the outlining by diamond drilling of 800,000 tons of silicious fluxing ore, estimated to average \$4.50 gold per ton with no copper, and the development of an ore shoot, estimated to contain 95,000 tons averaging \$29.00 gold per ton and 3.1 per cent copper at the west end of "H" ore body between the 1st and 4th levels.

From information obtained in drifting, diamond drilling, etc., in the various Noranda ore bodies, there is now indicated above the 1,975 foot level the following tonnages of direct smelting ore, concentrating ore and flux:- direct smelting ore, 3,580,000 tons, \$3.45 in gold, 7.10 per cent copper; concentrating ore, 6,350,000 tons, \$3.62 in gold, 1.54 per cent copper; flux, 1,030,000 tons, \$4.42 in gold and 0.32 per cent copper. A summary of ore shipments from the mine to the smelter and concentrator in 1931 is as follows:-

	<u>TONS</u>	<u>COPPER</u>	<u>GOLD</u>	<u>SILVER</u>
Direct smelting sulphide ore ...	426,008	5.94%	\$6.86	0.91 oz.
Silicious fluxing ore .....	268,105	1.03%	\$5.26	0.26 oz.
Concentrating sulphide ore .....	317,892	2.13%	\$3.87	0.35 oz.
Total .....	1,012,005			

The concentrator treated 317,792 tons of Horne mine ore, the average assay of which was 2.12 per cent copper, 0.36 oz. silver and 0.19 ozs. gold per ton from which 64,617 tons of concentrate were sent to the smelter.

The Aldermac mine and mill in Boischatel township prepared for production and it was expected that the property would commence producing copper and iron sulphide concentrates in January 1932.

As in 1930 practically all operations at the Waite-Ackerman-Montgomery Mines Ltd. were confined to exploration. A comparatively small tonnage of copper-gold-zinc ore was shipped to Noranda Mines Ltd.

The copper and gold refinery of the Canadian Copper Refiners at Montreal East began operations in February, 1931 and produced steadily throughout the remainder of the year. This plant has a rated yearly capacity of 75,000 tons of electrolytically refined metal.

Copper and precious metals contained in blister copper made from Flin Flon ores in Manitoba and from ores smelted at the Noranda smelter, Rouyn, Quebec, are refined or recovered at this plant.



ONTARIO - Practically all of the copper produced in Ontario during 1931 was obtained from the nickel-copper ores of the Sudbury area. The International Nickel Company mined a total of 1,580,355 tons of ore; the Copper Cliff smelter of the same company reported an output of 72,747 tons of bessemer matte and 22,013 tons of blister copper; Coniston smelter treated 427,717 tons of ore and produced 23,163 tons of bessemer matte. Output of blister copper at the Port Colborne refinery totalled 28,688 tons as compared with 59,503 tons in 1930. The new Copper Cliff refinery of the Ontario Refining Company was operated at approximately 50 per cent capacity. This plant electrolytically refines copper and recovers precious metals contained in blister copper produced in Ontario from ores mined by the International Nickel Company and blister copper produced by the Hudson Bay Mining & Smelting Company at Flin Flon, Manitoba, from Sherritt-Gordon ores. Some blister from the Anyox smelter of the Granby Company in British Columbia is also treated. The International Nickel Company report that copper sales during the year, inclusive of copper in sulphate produced in Wales, decreased from 109,743,747 pounds in 1930 to 96,919,677 pounds in 1931 or 12 per cent; gold sales of the company were 23,384 ounces. Proven ore reserves as at December 31, 1931, aggregated 205,606,715 tons.

Falconbridge Nickel Mines Ltd. mined 133,721 tons of nickel-copper ores. The smelter of this company, located near the mine at Falconbridge, Ontario, produced in 1931, 4,363 tons of matte and copper recovered by the company totalled 1,033 short tons. Grade of ore mined was held at 2.453 per cent nickel and 1.007 copper after picking out 17.8 per cent high silica material for concentration. Ore reserves are reported as at December 31, 1931, at 2,725,382 tons averaging 2.31 per cent nickel and .94 per cent copper. Matte from this company is treated at Norway.

MANITOBA - Copper-gold-zinc ores are produced in the northwestern part of Manitoba; the Hudson Bay Mining and Smelting Company operate a large mine, copper smelter and zinc refinery at Flin Flon close to the Saskatchewan boundary. This company reports that in 1931, 1,090,596 tons of ore were mined and milled. This averaged .089 ounces gold, 1.09 ounces silver, 1.94 per cent copper and 3.82 per cent zinc per ton and from this were produced and sold 73,000 ounces of gold, 702,128 ounces of silver, 31,068,556 pounds of copper and 35,056,199 pounds of zinc. The total cost of operation including mining, milling, etc., was \$3.13 per ton milled; operation of the open pit was carried on continuously during the year, 706,564 tons of ore were removed which averaged gold, 0.076 ozs; silver, 1.01 ozs.; copper, 1.8 per cent; zinc, 3.5 per cent. Ore mined underground and sent to concentrator totalled 390,693 tons assaying gold, 0.12 ozs; silver, 1.30 ozs.; copper, 2.19 per cent; zinc, 4.4 per cent. The cyanide annex recovered by a modification of the cyanide process, gold, silver and accessory copper out of the tailings discharged from the flotation section of the mill that treats the heavy sulphide ore. There were treated during 1931 in this plant 432,539 tons of sulphide ore tailings averaging per ton .04138 ozs. gold and .05446 ozs. silver. It was estimated in the 1929 report that to a depth of 900 feet and over an average width of seventy feet, reserves were 18,000,000 tons averaging with dilution 1.71 per cent copper, 3.45 per cent zinc, 0.074 ozs. gold, and 1.06 ozs. silver. The Island Falls power plant of this company operated continuously during the year. There was generated 166,630,000 kilowatt hours and the load factor at the plant was 80.5 per cent. The company reports both open and underground workings are in excellent condition for increased production.

Sherritt-Gordon Mines Ltd. mine and ship copper-gold ores at Sherridon, located in the Cold Lake area. During the early part of the year, to March 31st, plant construction was proceeded with and one unit of the mill installed ready for operation. In 1931 a total of 221,981 tons was mined and hoisted; of this 214,081 tons was ore which went to the mill; the balance, 7,900 tons, was rock which went to surface dumps. The 214,081 tons of ore milled yielded 14,718,387 pounds of copper, 4,039 ounces of gold and 125,845 ounces of silver, after deducting smelter losses. The mill tonnage



was stepped up as the mine output increased until, by the middle of May, the rated capacity of the unit, 600 tons in 24 hours, was reached. No attempt was made to recover the zinc. Average assay of heads were: copper, 3.735 per cent; gold, 0.26 ozs.; silver, 0.754 ozs. Percentage recovery was copper, 95.05; gold, 76.56; silver, 82.00. The company state that the results of the nine months' period of operation have, on the whole, been very satisfactory. The grade of ore milled has been considerably above the average grade of the reserves. No work of an exploratory nature was attempted during the period under review, however, in advancing the third level east drive to open new stopes, the so-called "low grade section" mentioned in the 1929 report of the company and then tentatively estimated at 1,116,500 tons, 1.4 per cent copper, 25 cents gold, 61 cents silver, has been opened for a distance of one-third its length and to date averages 2.5 per cent copper. Mining, traming and hoisting costs were well under \$1.00 per ton from an average stope width of 12.5 feet.

BRITISH COLUMBIA - Copper-gold ores are rather widespread in British Columbia. The following are the most important mines in the province: Britannia mine situated at Britannia Beach in the Vancouver mining division; Copper Mountain mine located near Princeton in the Similkameen mining division; and the Hidden Creek and Bonanza mines near Anyox in the Nass river mining division.

The Britannia mine discovered in 1888 represented in 1930 an investment of \$10,000,000 for mine property, mill, etc. The property now possesses over sixty miles of underground work. Owing to the drastic decline in the price of copper it became necessary in 1931 to adopt a policy of retrenchment at Britannia, resulting at the close of the year in a restriction of copper marketed from production, of less than one-quarter of plant capacity. Provision has been made for storage of product not sold. Further development at the mine below the 2,700 level, having disclosed a most promising continuance of ores of commercial grade at depth, extension of the 4,100 adit (mill level) a distance of 10,000 feet was started in September. Britannia concentrates are treated in the United States for recovery of copper and precious metals.

The Granby Company curtailed by closing down the Copper Mountain mine; this property has been in production for several years. The Hidden Creek mine owned by the same company was operated at higher than ordinary rate, economies have been worked out resulting in the per pound cost of copper being steadily lowered during the year. Exploration and development have been energetically continued at the property. Operations at the Bonanza mine, owned and operated by the Granby Company were continuous and concentrates from both this and the Hidden Creek mine were smelted at the Anyox smelter of the company. Copper, gold and silver contents of these ores were eventually recovered in Canadian and United States copper refineries.

NORTH WEST TERRITORIES - Northern Aerial Minerals Exploration Ltd. state that during the 1931 season some trenching was done on the copper deposits of that company located in the Copper Mine River area. In one trench widths are reported from 12 to 15 feet and check sampling gave an average copper content of 47.13 per cent. The showing on "D" group of claims in the same area was trenched and disseminated chalcocite ore body was indicated. This is reported to average 9 per cent copper with a width of 8 feet for at least 1,100 feet in length. A diamond drill was transported to the first-mentioned property late in the 1931 season.

Ventures Ltd. report that diamond drilling on the Sloan Copper find at Hunter Bay, Great Bear Lake, indicated that an important body of copper ore existed averaging 8 per cent to 10 per cent copper.

## PRINCIPAL STATISTICS OF THE COPPER-GOLD-SILVER MINING INDUSTRY IN CANADA, 1927-1931.

Year	No. of active opera- tors	No. of opera- ting plants or mines	Capital employed	Number of employ- ees	Salaries and wages	Cost of fuel and elec- tricity	Net value of ores, concen- trates, shipped by mines
			\$		\$	\$	\$
1927 ...	118	125	24,232,169	4,083	5,260,095	596,137	9,822,881
1928 ...	164	174	50,004,340	4,777	6,764,309	731,836	15,281,519
1929 ...	144	152	52,546,697	5,243	8,498,755	1,055,133	21,859,907
1930 ...	61	68	45,844,395	5,694	9,156,759	1,272,262	15,629,564
1931 ...	53	56	37,127,920	3,351	4,958,317	726,502	15,951,103

SHIPMENTS FROM COPPER-GOLD-SILVER MINES OF CANADA, 1930  
and 1931.

		Total metal content as determined by settlement assay					
	Quantity tons	Net value \$	Gold fine oz.	Silver fine oz.	Copper pounds	Sulphur tons	Zinc pounds
<u>1930</u>							
13 mines shipped to Canadian smelters -							
Ores.....	724,966	4,049,084	109,043	437,034	70,487,335	...	1,748,920
Concen- trates..	193,572	4,633,673	42,453	712,825	47,688,698	...	13,478,000
9 mines shipped to foreign smelters -							
Ores.....	391	3,513	31	456	26,023	...	...
Concen- trates .	137,332	6,798,210	16,877	335,134	65,656,756	...	11,527,280
Pyrites concen- trates ...	53,453	145,084	...	...	...	27,682	...
TOTAL ..	1,109,714	15,629,564	168,404	1,485,449	183,858,812	27,682	26,754,200
<u>1931</u>							
12 mines shipped to Canadian smelters -							
Ores.....	1,790,539	9,820,390	315,573	1,648,579	98,717,533	...	82,892,165
Concen- trates..	177,211	3,737,435	54,337	475,920	62,557,732	...	...
4 mines shipped to foreign smelters -							
Ores.....	55	1,520	58	150	5,345	...	...
Concen- trates .	71,015	2,236,631	5,396	164,957	35,012,918	...	...
Pyrites concen- trates ...	63,293	155,127	...	...	...	31,771	...
TOTAL ..	2,102,113	15,951,103	375,364	2,289,606	196,293,528	31,771	82,892,165



## THE WORLD'S LEADING GOLD MINES, 1931. (x)

Arranged in order of output

Name	Location	1931 Production		Dividends, 1931
		Gold, Oz .	Ore, tons	
Government Gold (a) ....	Union of S.A.	1,129,872	2,435,000	£1,260,000
Crown Mines (a) .....	Union of S.A.	986,329	3,136,000	£ 660,144
New Modderfontein (a)...	Union of S.A.	805,560	1,965,000	£1,610,000
Randfontein (a) .....	Union of S.A.	745,313	2,751,000	£ 101,589
Lake Shore (b) .....	Canada .....	533,757	816,580	\$4,800,000
East Rand Pty. (a) .....	Union of S.A.	501,085	1,865,200	£ 75,000
Hollinger (b) .....	Canada .....	487,123	1,640,705	\$3,444,000
New State Areas (a) ....	Union of S.A.	479,205	958,000	£ 976,621
Homestake Mining (c) ...	United States	432,381	1,403,939	\$2,122,302
Brakpan Mines (a) .....	Union of S.A.	414,539	1,138,500	£ 408,000
Springs (a) .....	Union of S.A.	413,688	843,000	£ 581,250
Sub Nigel (a) .....	Union of S.A.	352,624	410,700	£ 487,500
Robinson Deep (a) .....	Union of S.A.	334,457	1,158,000	£ 155,052
Geduld Propriety (a) ...	Union of S.A.	323,616	1,012,000	£ 493,039
Langlaagte Estates (a) .	Union of S.A.	317,659	943,000	£ 303,966
Teck-Hughes (b) .....	Canada .....	294,422	444,410	\$3,118,144
West Rand Consolidated .	Union of S.A.	287,225	1,066,000	...
Consolidated Main Reef(a)	Union of S.A.	271,140	795,000	£ 151,542
Van Ryn Deep (a) .....	Union of S.A.	268,940	753,000	£ 299,223
Modder Deep (a) .....	Union of S.A.	268,790	533,800	£ 600,000
Modder B (a) .....	Union of S.A.	264,895	887,000	£ 420,000
City Deep (a) .....	Union of S.A.	264,018	1,021,000	...
Simmer & Jack (a) .....	Union of S.A.	262,548	926,800	£ 41,667
Modder East (a) .....	Union of S.A.	255,908	865,500	£ 186,161
Noranda Mines (cn) .....	Canada .....	253,363	1,012,005	\$1,119,886
Nourse Mines (a) .....	Union of S.A.	248,329	827,600	£ 58,774
McIntyre-Porcupine (c) .	Canada .....	229,413	617,425	\$ 798,000
West Springs (a) .....	Union of S.A.	210,498	851,800	£ 134,475
Geldenhuis (a) .....	Union of S.A.	198,843	861,900	£ 56,666
Durban Roodepoort (a) ..	Union of S.A.	183,020	565,200	£ 56,250
Alaska Juneau (c) .....	United States	178,532	4,162,350	\$ 584,950
Ashanti Goldfields (d) ..	Gold Coast ..	172,685	147,104	£ 337,500
Kilo-Moto Gold (e) .....	Belgian Congo	170,003	(f)	19,431,267 fr.
Dome Mines (c) .....	Canada .....	169,686	542,600	\$ 953,334
Rose Deep (a) .....	Union of S.A.	153,028	741,500	£ 16,577
Witwatersrand Gold (a) ..	Union of S.A.	146,423	717,500	£ 23,481
Lake View & Star .....	Australia ....	143,493	231,873	...
Wright-Hargreaves (c) ..	Canada .....	140,520	266,352	\$ 825,000
New Kleinfontein .....	Union of S.A.	124,782	611,200	...
Cam & Motor (d) .....	Rhodesia ....	123,339	293,000	£ 150,000
Van Ryn Estate (a) .....	Union of S.A.	122,488	530,500	£ 31,250
St. John del Rey (d) ....	Brazil .....	115,473	221,800	£ 67,598
Witwatersrand Deep ....	Union of S.A.	103,767	442,900	...
Mysore Gold (d) .....	India .....	96,042	182,731	£ 43,005
Empire Star (c) .....	United States	96,000(g)	214,734	\$ 95,000
Iulpaards Vlei .....	Union of S.A.	94,471	374,500	...
Phelps Dodge (cq) .....	United States	90,720	(l)	\$4,210,892
Premier Gold (ch) .....	Canada .....	82,394	242,317	\$ 655,713
Benguet Consolidated (c)	Philippines .	80,603	112,524	\$ 850,000
Nundydroog (d) .....	India .....	79,856	123,039	£ 63,675
Boliden .....	Sweden .....	78,200	90,057	...
Waihi Gold (dh) .....	New Zealand .	75,468	223,722	£ 95,181



## THE WORLD'S LEADING GOLD MINES, 1931(x)

Arranged in order of output.

Name	Location	1931 Production		Dividends, 1931
		Gold, Oz .	Ore, tons	
Great Boulder Pty.(d)...	Australia....	73,904	120,140	£ 21,875
Natomas Dredging .....	United States	70,000(g)	(1)	...
Balatoc Mining (c) .....	Philippines .	68,085	57,675	\$ 675,000
Globe & Phoenix (d) ....	Rhodesia ....	65,865	72,512	£ 80,000
Champion Reef (d) .....	India .....	65,719	98,930	£ 26,000
Ooregum (d) .....	India .....	63,023	135,095	£ 6,000
Transvaal Gold (a) .....	Union of S.A.	60,295	190,216	£ 21,449
Wiluna Gold .....	Australia ...	58,898	215,833	...
East Geduld .....	Union of S.A.	56,003	231,700	...
Oriental Consolidated(c)	Chosen .....	54,987	(1)	\$ 429,390
Meyer & Charlton .....	Union of S.A.	49,080	206,120	...
Eureka Standard (c) ....	United States	48,207	36,622	\$ 179,951
Yuba Consolidated (j) ..	United States	47,006	14,446,498(i)	(1)
Boulder Perseverance ...	Australia ...	45,500	84,270	...
South Kalgurli (d) .....	Australia ...	44,900	101,171	£ 31,125
Sylvanite Gold (c) .....	Canada .....	43,437	91,621	\$ 131,980
Taquah & Abooso (d) ....	Gold Coast ..	42,922	120,053	£ 24,125
Wanderer Consolidated ..	Rhodesia ....	42,248	(1)	...
Sons of Gwalla .....	Australia ...	41,900	150,564	(o)
Howey Gold .....	Canada .....	41,702	211,552	...
Chosen Corporation (k) .	Chosen .....	39,349	115,100	...
Oresson Consolidated (c)	United States	38,385	80,479	\$ 48,800
Lonely Reef (d) .....	Rhodesia ....	38,264	255,675(o)	£ 57,859
Frontino Gold (dk) .....	Colombia ....	37,130	36,140	£ 7,688
Grand Lacs Africains (e)	Belgian Congo	36,940	(1)	1,400,000 fr.
Coniaurum .....	Canada .....	36,278	130,585	...
Siscoe Gold .....	Canada .....	35,936	55,675	(m)
Idaho-Maryland .....	United States	33,400(g)	54,000(g)	...
Rezende Mines (d) .....	Rhodesia ....	32,557	76,400	£ 37,500
Shenandoah-Dives .....	United States	30,561	170,795	...
Pioneer Gold (b) .....	Canada .....	30,000	34,000	\$ 155,840
Kirkland Lake Gold .....	Canada .....	28,315	52,628	...
Elkoro Mines .....	United States	28,000(g)	(1)	...
Sherwood Star (d) .....	Rhodesia ....	27,450	55,200	£ 30,000
Balaghat Gold .....	India .....	25,835	41,850	...

(a) Pays dividends in South African pounds, which are still at par of \$4.86, U.S. currency.

(b) Pays dividends in Canadian dollars, which, since last September, have fluctuated between 85¢ and 90¢ U.S. currency.

(c) Pays dividends in U.S. currency.

(d) Pays dividends in English pounds, which, since last September, have fluctuated between \$3.40 and \$3.90.

(e) Pays dividends in Belgian francs, worth 2.78¢ U.S. currency. Dividend paid in 1931 was out of profits for 1930. Previous year not available.

(f) Handles both alluvial and lode material, so no tonnage figure can be given.

(g) Official data unobtainable. Estimated.

(h) Also an important silver producer, but gold is most valuable product.

(i) Cubic yards of gravel dredged.

(j) Year ended Feb. 28, 1931.

(k) Year ended June 30, 1931.

(l) Not available.

(m) Initial dividend of 4¢ a share on 4,000,000 shares paid in March, 1932, out of 1931 profits.

(n) Also an important copper producer, but gold was most valuable product in 1931.

(o) Ore and tailing treated.

(q) Primarily a copper producer; figures include Calumet &amp; Arizona statistics.

(x) Taken from "Engineering and Mining Journal" - April, 1932 - S. D. Strauss.



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