1905

MINERAL PRODUCTION OF CANADA

ROBERT BELL, I.S.O., D.Sc. (Cantab), LL.D., F.R.S.
Acting Deputy Head and Director.

SIR,—I have the honour to submit herewith the annual preliminary statistical statement of the mineral production of Canada for 1905.

Although the figures given herewith are, as stated, subject to revision, they may still be taken as a very close approximation to those which will be given in the final report.

The completed Annual Report will follow later and, besides containing a revise of the general table of production, will include other details relating to exploration, development, exports, etc.

Much of this information is not available till several months after the close of the year ; the compilation and printing necessarily occupy some time; the Annual Report therefore cannot be completed till well on in the year following the one covered.

I have the honour to remain, sir,

Your obedient servant,

ELFRIC DREW INGALL.

SECTION OF MINES, March 2, 1906.

GEOLOGICAL SURVEY OF CANADA

SECTION OF MINES

SUMMARY

OF THE

MINERAL PRODUCTION OF CANADA

FOR

1905

ELFRIC DREW INGALL, M.E.

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OTTAWA

PRINTED BY S. E. DAWSON, PRINTER TO THE KING'S MOST EXCELLENT MAJESTY

1906

No. 924

GEOLOGICAL SURVEY OF CANADA

SUMMARY OF THE MINERAL PRODUCTION OF CANADA IN 1905.

(Subject to Revision.)

Product.	Quantity. (a)	Value. (a)
METALLIC.		$
Copper (b) ..... Lbs.	47,597,502	7,420,451
Gold, Yukon.....$8,327,200		
" all other 6,159,633		
.....	.....	14,486,833
Iron ore (exports, estimated).....Tons.	116,779	125,119
*Pig iron from Canadian ore..... "	70,554	1,047,860
Lead (c)..... Lbs.	55,961,000	2,634,084
Nickel (d)..... "	18,876,315	7,550,526
Silver (e)..... Oz.	5,974,875	3,605,957
Cobalt.....	.....	100,000
Other metallic products including zinc	.....	180,000
Total metallic	.....	37,150,830
NON-METALLIC.		
Asbestus.....Short tons.	50,670	1,486,359
Asbestic ..... "	17,594	16,900
Chromite..... "	8,575	93,301
Coal ..... "	8,775,933	17,658,615
Corundum..... "	1,644	149,153
Felspar ..... "	11,700	23,400
Graphite..... "	541	17,032
Grindstones..... "	5,172	57,200
Gypsum..... "	435,789	581,543
Limestone for flux in iron furnaces..... "	341,614	258,759
Manganese ore (exports) ..... "	22	1,720
Mica..... "	.....	168,043
Mineral pigments—		
Barytes ..... "	3,360	7,500
Ochres..... "	5,105	34,675
Mineral water.....	.....	100,000
Natural gas (g).....	.....	314,249
Petroleum (h)..... Brls.	634,095	849,687
Phosphate..... Tons.	1,300	8,425
Pyrites..... "	32,744	123,574
Salt..... "	45,370	310,358
Talc..... "	500	1,800
Tripolite..... "	200	3,600

The total production of pig iron in Canada in 1905 from Canadian and imported ores amounted to 527,932 short tons valued at $6,492,972, of which it is estimated 70,554 tons valued at $1,047,860 should be attributed to Canadian ore and 457,378 short tons valued at $5,445,112 to the ore imported.

SUMMARY OF THE MINERAL PRODUCTION OF CANADA IN 1905—*Concluded.*

(Subject to Revision.)

Product.	Quantity. (a)	Value. (a)
STRUCTURAL MATERIALS AND CLAY PRODUCTS.		$
Cement, natural rock ..... Brls.	14,184	10,274
" Portland ..... "	1,346,547	1,913,740
Flagstones		7,650
Granite		209,555
Sands and gravels (exports) ..... Tons.	366,935	152,805
Sewer pipe		382,000
Slate		21,568
Terra-cotta, fireproofing, etc.		64,892
Building material, including bricks, building stone lime, etc.		6,095,000
Total structural materials and clay products		8,857,484
Total all other non-metallic		22,266,393
Total non-metallic		31,123,877
Total metallic		37,150,830
Estimated value of mineral products not returned		300,000
Total, 1905		68,574,707
1904, Total		60,073,897
1903 "		62,600,434
1902 "		63,885,999
1901 "		66,339,158
1900 "		64,618,268
1899 "		49,584,027
1898 "		38,697,021
1897 "		28,661,430
1896 "		22,584,513
1895 "		20,648,964
1894 "		19,931,158
1893 "		20,035,082
1892 "		16,623,417
1891 "		18,976,616
1890 "		16,763,353
1889 "		14,013,113
1888 "		12,518,894
1887 "		11,321,331
1886 "		10,221,255

(*a.*) Quantity or value of product marketed. The ton used is that of 2,000 lbs.
(*b.*) Copper contents of ore, matte, &c., at 15·590 cents per lb.
(*c.*) Lead contents of ore, &c., at 4·707 cents per lb.
(*d.*) Nickel contents of ore, matte, &c., at 40 cents per lb.
(*e.*) Silver contents of ore at 60·352 cents per oz.
(*f.*) Oven coke, all the production of Nova Scotia, British Columbia and the North-west Territories.
(*g.*) Gross return from sale of gas.
(*h.*) Deduced from the amount paid in bounties and valued at $1.34 per barrel.

REMARKS.

In the accompanying general table it is shown that the mineral production of Canada during 1905, aggregated over sixty-eight and a half million dollars. In comparing this record with that of previous years, it must be born in mind that complete figures are never available at this time of year, so that in a number of items the data are necessarily partly estimated. Allowing for this, however, there is found to be a considerable increase of approximately eight and a half million dollars or about 14 per cent. This is the more remarkable, as the falling off in the output of gold from the Yukon continues and as will be seen amounted to over two million dollars in value.

Notwithstanding this, the metallic class shows an aggregate increase of about six and a quarter million dollars, and leaving the Yukon placer gold out of consideration, the general mineral industry of the rest of the provinces shows a very considerable augmentation approaching eleven million dollars.

——	Increase.	Decrease.
	$	$
Copper	2,117,875	
Gold, Yukon	.....	2,172,800
" all other	197,116	
Pig iron (from Canadian ore)	39,996	
Lead	1,016,863	
Nickel	3,331,373	
Silver	1,558,862	
Other metallic products	140,707	
Asbestus	276,907	
Coal	1,066,384	
Corundum	39,608	
Gypsum	208,069	
Limestone for flux in iron furnaces	81,164	
Petroleum	.....	86,208
Natural cement	.....	35,973
Portland cement	625,748	
Granite	59,555	
Other net increases	35,564	
Total	10,795,791	2,294,981
Net increase	8,500,810	

The proportional increases and decreases of various mineral products constituting nearly 95 per cent of the production are given in the subjoined table :—

Product.	Quantity.		Value.	
	Increase.	Decrease.	Increase.	Decrease.
	p.c.	p.c.	p.c.	p.c.
Metallic :				
Copper	15·02		39·91	
Gold				12.00
Pig iron (from Canadian ore only)	3·30		3·97	
Pig iron (from both home and imported ores)	73·97		76·06	
Lead	49·11		62·88	
Nickel	78·96		78·96	
Silver	67·01		76·15	
Non-metallic :				
Asbestus and asbestic	40·85		22·58	
Chromite	41·18		38·95	
Coal	6·32		6·43	
Gypsum	25·96		55·71	
Petroleum	25·94			9·21
Portland cement	47·91		48·58	

1904.		1905.	
Products.	Per cent of total mineral production of Canada.	Products.	Per cent of total mineral production of Canada.
1 Coal	27·62	1 Coal	25·77
2 Gold	27·40	2 Gold	21·14
3 Brick, stone and lime	9·67	3 Nickel	11·02
4 Copper	8·83	4 Copper	10·83
5 Nickel	7·02	5 Brick, stone and lime	8·62
6 Silver	3·41	6 Silver	5·26
7 Lead	2·69	7 Lead	3·84
8 Cement	2·22	8 Cement	2·81
9 Asbestus	2·04	9 Asbestus	2·19
10 Pig iron (from Canadian ore)	1·68	10 Pig iron (from Canadian ore)	1·53
11 Petroleum	1·56	11 Petroleum	1·24

The foregoing table is intended to convey an idea of the relative importance of the various industries as contributors to the grand total of the mineral income of the country. It will be noticed that coal

now occupies the largely predominant position and that when added to the total value of the metallic products, about 80 per cent of the production of the country is accounted for.

Gold.—The gold-producing industries of all the provinces show an encouraging increase in comparison with previous years. The largest contributor, as for several years past, has been the Yukon Territory which is to be credited with over 57 per cent ; British Columbia coming next with nearly 40 per cent. Nova Scotia and Ontario together with a little from Quebec and Alberta, completed the remainder of a little under 3 per cent necessary to make up the total.

In Nova Scotia there was a slight recovery from the general decrease in the production, which has been apparent for a number of years. The explanation would seem to lie in the fact that the immediately accessible surface ores of most of the districts have been mostly worked out, and the revival of the industry will depend upon the inauguration of a radically different policy to that which has been followed so far. It is believed that consolidation of many of the numerous smaller mines and the inauguration of new methods and plant suitable for the economical mining of ore from greater depths, will lead to renewed activity. As these matters seem to be receiving serious attention, a revival of the industry is looked for.

In Ontario, activity was evident in prospecting and developing at numerous points both in the old districts in the eastern parts of the province and in the newer gold-bearing districts west of Thunder Bay.

In British Columbia, a dry season is said to have affected the production of placer gold, but as a whole the industry is about as last year.

The output of the Yukon Territory placers continued to fall off as expected and will probably continue until under favourable conditions the more permanent forms of mining of the lower grade bodies of gravels are fully established.

Silver.—For a considerable time now, the production of silver has been nearly altogether accounted for by the silver contents of the various ores of other metals mined and treated in British Columbia. This province furnished 90 per cent of the metal during 1905. Owing, however, to the discovery and working of the exceedingly rich silver-cobalt-nickel ores near the northern end of Lake Timiscaming in Ontario, that province has suddenly attained almost to an equality with British Columbia and between them they now furnish over 98 per cent of the total output.

The shipments made so far from the silver camp at Cobalt, Ont., have been to smelters, chiefly in the United States. The results have not apparently been satisfactory to the shippers, and efforts are being made towards the erection of smelters to treat the ores locally. At Copper Cliff the Canadian Copper Company have already erected a

plant capable of partially treating these ores with elimination of the excess of arsenic.

The silver occurs mostly in the metallic condition and although the veins worked are small, being measured in inches of thickness instead of feet, the silver values are so high that although only in the second year of its existence, the aggregate value of the shipments has been extraordinary, especially in view of the comparatively limited amount of the development work done. Carloads of ore reported at from $60,000 to $100,000 in value have not been unusual.

For the first six months of 1905, official figures give the shipments as 891 tons, aggregating $688,004, or a little over $772 per ton. These results, it is important to consider, were due to the work carried on at some six mines in a camp the existence of which dated only from the previous fall.

A recent bulletin, issued by the Geological Survey, draws attention to another most important and recent discovery on the west side of Windy Arm, a southerly branch of Lake Tagish. This is situated in the southwesterly part of the Yukon Territory and is the more important as it is easily reached from the White Pass and Yukon railway. The report describes the veins as strong, persistent, and already traced for considerable distances. The widths mentioned are of from one to five feet in one case, up to nine feet in another. The minerals contained are native silver, argentite, stephanite, freibergite, pyrargyrite, galena, tetrahedrite, chalcopyrite, native copper, malachite, azurite, iron pyrite, arsenopyrite, pyrrhotite and sphalerite. The antimonial and arsenical silver minerals seem to be the most common form of occurrence of that metal. The main values are in silver and gold.

In British Columbia, considerable quantities of fine silver and of base bullion and other products carrying the metal are produced at the Trail smelter.

Cobalt.—*Mention has already been made in connexion with silver of the discoveries of cobalt ores in the north western part of Ontario. Whilst the great richness in silver of these deposits is the feature giving them their great importance, the occurrence of these arsenide ores of cobalt is of great interest. Unfortunately, the supply thus rendered available has proved too great for the consumption at present, but it is hoped that this very abundance will ead to new uses being found for this metal and to its becoming later a valuable asset.

Copper.—In the production of this metal, British Columbia still retains the pre-eminence. In 1904, the province was credited with over 80 per cent of the whole, and although still maintaining a very long lead, increased production both in Ontario and Quebec have considerably reduced that held by the western province.

* Recent figures published in the Toronto "Globe" give the value of output of this metal during 1905 at $100,000. From information recently to hand, it would also seem possible that the difficulties with regard to marketing the Cobalt may be less than anticipated.

The copper of Quebec still represents the content of the pyritous ores mined for so long a period of years; whilst the Ontario output is, as formerly, produced in operating the nickel and copper ores of Sudbury. A number of small mines are worked upon deposits of chalcopyrite and the recent change of ownership of the Bruce Mines would seem to promise the early re-entry of these old mines into the field of activity. So far, however, the Sudbury mines must be credited with the bulk of the results.

In British Columbia, the figures show a continued increase in the output of copper-bearing products. In 1904, the Boundary district produced over 61 per cent; the Rossland camp about 20 per cent; the Coast district over 16 per cent, the remaining approximation (3 per cent) being derived from Yale, Kamloops, Nelson and various other districts. It is locally estimated that the Boundary district increased its output by probably $1,000,000, the other districts remaining practically stationary or showing slight falling off, so that the prominence of the first-named camp must have been considerably increased.

The increase in the total value of the output of copper for the Dominion has been greatly enhanced by the rise in the average price of the metal of about 3 cents.

Iron.—About 116,779 short tons of iron ore, being a part of the output of the Helen mine at Michipicoten, were exported during 1905. In addition to the ore exported, about 173,171 tons of ore were mined in Canada and charged to Canadian blast furnaces.

Besides the above Canadian ore, 861,847 tons of imported ore, valued at the furnaces at $1,168,420, were used in Canadian furnaces. The total amount of pig iron manufactured from both Canadian and imported ores was 527,932 tons valued at $6,492,972 as compared with 303,454 tons valued at $3,582,001 in 1904.

The total amount of bounty paid on iron and steel by the Dominion Government during the calendar year 1905 was $1,900,206.

Although the production of pig iron from Canadian ores only does not show a very large growth, the industry as a whole shows large proportional advancement and new furnaces at several points are contemplated or in course of construction. With the new iron ore districts more recently brought to light and the greater accessibility of many discovered in past years, the home ore mining industry promises to take a far more prominent and fitting position.

Lead.—Assisted by the Dominion bounty, lead production again shows a large increase, nearly 50 per cent more lead being produced in 1905 than in the previous years. The production in 1905 was approximately 27,980 tons as compared with 18,765 tons in 1904.

The total amount paid in bounties during the calendar year 1905 was $334,224. The payment of bounty on lead in ore exported to Europe ceased on June 30, and owing to the rise in the price of lead, the rate of bounty payable in other cases, was gradually diminished

and all payments ceased in November, when the price of lead reached $16 per long ton.

The average price of lead on the New York market in 1904 was 4·309 cents per pound and in 1905 it had increased to 4·707 cents, an advance of ·396 cents or 9·2 per cent.

Exports of lead in ore according to Customs returns, were 7,284 tons to the United States and 20,175 to other countries; exports of pig lead were 21 tons to the United States and 632 tons to other countries or a total export of lead of 20,852 tons.

The Canadian Smelting Works at Trail, B.C., has had an electrolytic lead refinery in operation for two years producing pig lead, lead pipe, sheet lead, etc., of exceptional purity. At the present time, about 50 tons per day are being treated, and lead is being supplied to the corroding works recently established by the Carter White Lead Company of Canada, Limited, at Montreal. This latter plant is equipped with machinery for an immediate capacity of 7,000 tons per annum, but is designed for an ultimate capacity of 15,000 tons and will use Trail lead exclusively.

Nickel.—The following were the aggregate results of operations on the nickel-copper deposits of Ontario in 1905 :—

	Tons of 2,000 lbs.
Ore mined	277,766
Ore smelted	251,421
Matte produced	17,388
Matte shipped	17,405
Matte in stock at end of year	2,675
Copper contents of matte shipped	4,386
Nickel contents of matte shipped	9,438
Value of matte shipped	$4,019,814

According to Customs returns, exports of nickel in matte, etc., were for the twelve months ending Dec. 31, as follows :—

	Pounds.
To Great Britain	1,281,594
To United States	16,036,465
Total	17,318,059

The price of refined nickel remained fairly steady throughout the year. According to the 'Engineering and Mining Journal,' of New York, quotations for large lots, New York or other parallel delivery, were 40 to 47 cents per pound, according to size and condition of order. For small quantities prices ranged from 48 to 60 cents, also according to size for order and delivery.

Some of the ores from the now famous Cobalt district contain from 4 to 7 per cent of nickel in addition to the silver, cobalt and arsenic, but no statistics of production of nickel from this district have been included in the table of production.

Zinc.—The zinc ores of British Columbia, which were formerly regarded as merely detrimental constituents of the combined lead and zinc sulphuret ores of the province, have for some time been the subject of great interest on account of the demand which has recently arisen for ores of this metal. Already attention has been turned towards utilizing the zinc blende associated with the argentiferous galena of the various camps in East and West Kootenay. Mill practice has been altered at some of the mines already operating so as to give a satisfactory separate zinc product, and attention is also being turned toward the opening up of various claims where the large proportion of blende present had formerly debarred profitable work. The 'Daily News,' of Nelson, B.C., estimates a production for the province of over 13,000 tons with an average content of 42 per cent of the metal.

The recently erected smelter at Frank in Southern Alberta, owned by the Canadian Metal Company, will ensure the utilization of much of the ore in the country. The production of zinc ores in this province is likely to increase very largely in the future should the active demand continue, as their existence in quantity is already known at very many places.

The whole question of supply and utilization of these ores is now under investigation by a commission instituted by the Federal Government.

Coal.—The coal output represents the result of operations in the old established fields of Nova Scotia and on Vancouver Island, British Columbia as well as in the comparatively recently opened districts of Southeast Kootenay and Southwestern Alberta. Smaller amounts have been contributed by a number of operators at various points throughout the provinces of Alberta and Saskatchewan, as well as from New Brunswick and Yukon Territory. The whole industry shows an increase of over a million dollars or about six per cent as compared with 1904.

The different provinces contributed to the total as follows :— Nova Scotia over 60 per cent; British Columbia nearly 20 per cent; the remainder being attributed to the other districts before mentioned. In all districts the output showed an increase over that for 1904.

Natural gas and petroleum.—Prospecting for these minerals has been very active and word comes from numerous points from all over Canada of test borings in progress, whilst in very many places the glowing newspaper reports are greatly exaggerated; still, the prospects as a whole are hopeful for finding these substances in paying quantities outside and far removed from the present well-established fields as well as for the extension of the known productive areas of these latter.

Asbestus.—The production of asbestus divided into crude and mill stock was as follows :—

	Tons.	$
Crude	3,768	472,859
Mill stock	46,902	1,013,500
Total asbestus	50,670	1,486,359
Asbestic	17,594	16,900
Total products	68,264	1,503,259

Exports of asbestus according to Customs returns were 47.031 tons, valued at $1,386,115.

This industry continues much as usual, the two general features of interest being the very considerable increase in output and the promising discovery of long fibre of good quality in the Chibougamau Lake district, about 150 miles northwesterly from Lake St. John, in Northern Quebec.

Cement.—The production of natural rock cement which in 1904 had decreased to 56,814 barrels, valued at $50,247, fell off in 1905 to the comparatively small amount of 14,184 barrels, valued at $10,274. This was made by three firms in Ontario.

The production of Portland cement, however, continues to increase steadily. Thirteen companies were operating plants during 1905 with a total daily capacity of about 8,000 barrels, viz.; one in Nova Scotia, two in Quebec, nine in Ontario and one in British Columbia, while another in Ontario was engaged in reconstruction work.

Detailed statistics of production in 1904 and 1905 are as follows :—

		1904.	1905.
Portland cement sold	brls.	910,358	$1,346,548
" manufactured	"	908,990	1,533,628
Stock on hand, Jan. 1	"	113,419	112,086
" Dec. 31	"	112,051	299,166
Value of cement sold		$1,287,992	$1,913,740

The average price per barrel at the works in 1905 was $1.42, being only a fraction of a cent higher than the average price in 1904.

The imports of Portland cement into Canada in 1905 were :—

		Quantity.	Value.
Six months ending June	cwt.	1,043,659	$ 405,182
" December	"	1,470,306	509,422
Total		2,513,965	$ 914,610

This is equivalent to 718,275 barrels of 350 ponds each at an average price per barrel of $1.27. The duty is twelve and a half cents per hundred pounds.

The imports in 1904 were equivalent to 784,630 barrels of 350 pounds each valued at $1,061,056, or an average price per barrel of $1.35.

As there is very little cement exported from Canada, the consumption of this product in the country in 1905, would be approximately 1,346,548 barrels of home product and 718,275 barrels of imported, or a total of 2,064,823 barrels.

Exports of the Product of the Mine, Year 1905.

Products.		Quantity.	Value.
			$
Arsenic	Lbs.	108,000	5,400
Asbestus	Tons	47,031	1,386,115
Barytes	Cwt.	34,488	14,343
Chromite	Tons	5,042	45,072
Coal	"	1,635,287	4,029,457
Feldspar	"	9,161	27,660
Gold bearing quartz, dust, nuggets, etc.	$	.....	13,706,969
Gypsum, crude	Tons	359,246	388,474
Copper, fine in ore, etc	Lbs.	40,470,879	5,401,490
" black or coarse, and in pigs	"	269,982	42,383
Lead in ore, etc	"	40,350,792	1,011,655
" pig, etc	"	1,306,611	34,886
Nickel, in ore, etc	"	17,318,059	1,569,693
Platinum, in ore concentrates, etc	Oz.	15	283
Silver in ore, etc	"	1,740,742	2,777,218
Mica	Lbs.	1,087,781	179,049
Mineral pigments	"	707,247	7,704
" water	Galls.	4,173	2,137
Oil—			
Crude	"	35	2
Refined	"	7,228	2,078
Ores—			
Antimony	Tons	525	27,118
*Iron	"	168,289	407,881
Manganese	"	22	1,720
Other ores	"	17,383	687,565
Phosphate	"	40	1,253
Plumbago, crude	Cwt.	5,088	7,596
Pyrites	Tons	19,755	55,767
Salt	Lbs.	1,447,728	6,112
Sand and gravel	Tons	306,935	152,805
Stone, ornamental	"	2,878	898
" building	"	59,355	12,191
Stone for manufacture of grindstones	Tons	669	7,407
Other products of the mine		.....	71,331
Manufactures—			
Acid (sulphuric)	Lbs.	232,203	2,718
Bricks	M.	754	5,888
Aluminium in bars, etc	Lbs.	2,535,386	508,219
Aluminium, manufactured	$	.....	1,558
Cement	"	.....	3,143
Clay	"	.....	35
Coke	Tons	116,071	509,908
Grindstones, manufactured	$	.....	17,461
Gypsum, ground	"	.....	2,673
Iron and steel—			
Stoves	No.	986	11,637
Castings, N.E.S	$	.....	64,970
Pig iron	Tons	866	22,284
Machinery	"	.....	393,170
Sewing machines	No.	977	21,972
Typewriters	"	4,100	138,941
Scrap iron and steel	Cwt.	482,179	240,105
Hardware	$	.....	170,262
Steel and mfgs. of	"	.....	224,217
Lime	"	.....	85,723
Metals, N.O.P	"	.....	81,945
Plumbago, mfgs. of	"	.....	518
Stone ornamental	"	.....	3,107
" building	"	.....	438

* Figure known to be too high owing to duplication in entries.