

If due attention be paid to the above details, I believe the cyanide method will prove itself superior to the iodide volumetric method. The latter is certainly no quicker, and consumes much larger quantities of chemicals, besides being subject to many sources of error. The colorimetric assay, an improved application of which has been described by Mr. J. D. Audley Smith in a recent paper before this Institute, is adapted to low-grade ores only, and for these does not seem to possess any advantages over the cyanide method, either in point of time or accuracy of results.

By effecting the solution in acid on a thick asbestos pad, heated by gas or gasoline burners, a number of assays can be run through at once, requiring little or no attention from the time they are placed on the fire until they are ready for the addition of ammonia. The "mixed acid" used is kept prepared in quantity, and so is the dilute ammonia. For measuring out the portions of acid and ammonia for each assay, the most convenient vessel is a graduated cylinder of 100 c.c. capacity, with a foot.

The same method can be applied with equal success to richer ores, as well as to concentrates and mattes. For low-grade ores, containing not over 1 per cent. of copper, the KCN solution should not be stronger than 1 c.c. = 0.005 grammes of copper. For richer material, a solution of twice this strength can be used to advantage.

#### MINERAL PRODUCTION OF CANADA, 1901.

THE following annual preliminary statistical statement of the mineral production of Canada, for 1901, has been prepared by the Section of Mines of the Geological Survey of Canada. Although the figures given 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:

Product.	Quantity. (a)	Value. (a) \$
<b>METALLIC.</b>		
Copper (b).....Lbs.	40,951,196	6,600,104
Gold, Yukon.....\$18,000,000		
" all other.....	6,462,222	24,462,222
Iron ore (exports).....Tons.	306,199	762,284
+Pig iron from Canadian ore.....	83,100	1,212,113
Lead (c).....Lbs.	50,756,440	2,199,784
Nickel (d).....	9,189,047	4,594,523
Silver (e).....Oz.	5,078,318	2,993,668
Total metallic.....		42,824,698
<b>NON-METALLIC.</b>		
Actinolite.....Tons.	531	3,126
Arsenic.....	695	41,676
Asbestos and asbestic.....	38,079	1,186,434
Chromite (exports).....	1,759	25,444
Coal.....	6,186,286	14,671,122
Coke (f).....	373,625	1,264,360
Corundum.....	435	53,115
Felspar.....	5,226	4,710
Fire clay.....	3,979	5,020
Graphites.....	1,440	28,880
Grindstones.....	5,701	55,690
Gypsum.....	293,799	340,148
Limestone for flux.....	169,399	183,162
Manganese ore (exports).....	440	4,820
Mica.....		160,000
<b>Mineral pigments—</b>		
Baryta.....	653	3,842
Ochres.....	2,233	16,735
Mineral water.....		100,000
Moulding sand.....Tons.	14,620	29,240
Natural gas (g).....		312,359
Peat.....Tons.	220	660
Petroleum (h).....Bbls.	588,528	953,415

Pyrites.....Tons.	28,261	113,044
Salt....."	59,428	262,328
Talc....."	259	842

#### STRUCTURAL MATERIALS AND CLAY PRODUCTS.

Product.	Quantity. (a)	Value.
Cement, natural rock.....Brls.	133,328	\$ 94,415
Cement, Portland....."	297,066	535,615
Granite.....		155,000
Pottery.....		200,000
Sands and gravels (exports).....Tons.	197,302	117,465
Sewer pipe.....		250,115
Slate.....		9,980
Terra-cotta, pressed brick, etc.....		278,671
Building material, including bricks, building stone, lime, tiles, etc.....		4,820,000
Total structural materials and clay products.....		6,461,261
Total all other non-metallic.....		19,821,072
Total non-metallic.....		26,282,333
" metallic.....		42,824,698
Estimated value of mineral products not returned.....		300,000
Total, 1901.....		69,407,031
1900, total.....		64,488,037
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 ".....		16,628,417
1891 ".....		18,076,616
1890 ".....		16,763,353
1889 ".....		14,013,913
1888 ".....		12,518,894
1887 ".....		11,321,331
1886 ".....		10,221,255

#### REMARKS.

It is gratifying to note that the value of the mineral production of the country still increases, notwithstanding a considerable falling off in the gold output. The growth shown is equivalent to nearly 8 p. c. addition to the total value for 1900. This is of course a much smaller proportional increase than those shown during the previous few years, but it is encouraging to find that it is due to the large expansion of the more permanent mineral industries, such as the metallic, including iron smelting, with coal, coke, asbestos, etc., amongst the non-metallic. All along the line the evidence of this vote has been quite marked, giving great promise for the future, so that the inevitable falling off which must occur from time to time in the output of gold from shallow placer workings, bids fair to be made up by the growth of those mineral industries that are now becoming such a factor in the commercial life of the country. Leaving the Yukon district out of consideration, the permanent metal mining industries shew an increase of nearly 37 p. c. notwithstanding a falling

+The total production of pig iron into Canada in 1901 from Canadian and foreign ores amounted to 274,376 tons, valued at \$1,512,231, of which it is estimated that 83,100 tons, valued at \$1,212,113 should be attributed to Canadian ore and 191,276 tons, valued at \$2,300,810, to the ore imported.

(a) Quantity or value of product marketed. The ton used is that of 2,000 lbs.

(b) Copper contents of ore, matte, etc., at 16 17 cents per lb.

(c) Lead contents of ore, etc., at 4 34 cents per lb.

(d) Nickel contents of ore, matte, etc., at 50 cents per lb.

(e) Silver contents of ore at \$8.95 cents p. r. oz.

(f) Oven coke, all the production of Nova Scotia and Br. Columbia.

(g) Gross return from sale of gas.

(h) Calculated from inspection returns at 100 galls. crude to 54 refined oil, and computed at \$1.62 per brl. of 35 imp. galls.