Columbia has contributed, besides the greatest value in gold and silver, large values in copper and lead, which are found in combination with the ores of the more precious metals. It gave to the country last year $1,788,000 of gold, $2,100,000 of silver, and some $400,000 of copper, besides a large value in lead. Against these satisfactory features there are noted, in this department, decreases in the production of nickel and iron ore. For the first no cause is given. The second is attributed to the dull state of the iron market during 1896, a condition that, happily, now gives promise of soon passing away, when, if nothing untoward occurs, a renewal of growth in this branch of industry should be experienced.

In the non-metallic division, which includes a large variety of articles, from mica to mineral water, the growth has not been so marked as in the metals. The figures are as follows:—

1886-8,	average	$9,595,334
1894,	production	16,057,330
1895	"	15,295,231
1896	"	15,087,665

The falling off noted is chiefly in the subdivision of structural materials, and is no doubt to be attributed to causes of the same nature as led to the decline, in the past two years, in iron ore production, above alluded to, and arising out of the general dullness of trade. There are, however, some satisfactory features to be noted in spite of the drawbacks. The article of coal, which contributes nearly one-half of the total to the value of the division last year, exceeded the production of 1895, in spite of the slowness in trade, a fact due to the greater activity in Nova Scotia. The following shows the movement of the principal items in the non-metallic division since 1896:—

	Average. 1886-8	*Product.* 1895	*Product.* 1896
Asbestos...	$229,411	368,175	429,856
Coal	5,011,882	7,727,446	8,006,305
Coke	124,024	143,007	111,560
Gypsum ...	179,804	202,608	174,403
Mineral wtr.	11,456	126,048	111,736
Natural gas	.....	423,032	276,301
Petroleum .	596,412	1,090,520	1,155,646
Phosphate .	288,812	9,565	3,990
Pyrites	216,642	102,594	101,155
Salt	193,016	160,455	169,677
Bricks	965,678	1,670,000	1,600,000
Buil'g stone	612,162	1,095,000	1,000,000
Lime	339,529	700,000	650,000

The disappearance of the phosphate trade and the falling off in the output of natural gas are noteworthy instances of the effects, in regard to the first, of the discovery of larger and better situated deposits, and, in the second, of the exhaustion of the supply. This latter appears to be a danger to which natural gas areas are peculiarly liable. It has been noted in the United States, as well as in the Welland district in Ontario, where the falling off chiefly took place. By many it was feared that the petroleum areas would be subject to similar danger; but the figures of the bulletin do not bear out the theory. The output of the Canadian wells last year was greater than ten years ago, and this in spite of a very material reduction of the protection they had against foreign competition. On the whole the Canadian mineral industry can be said to show many signs of healthy growth, that it can reasonably be hoped will be greatly increased in the immediate future. —Montreal *Gazette.*

Details of Production.

A SUMMARY of the mineral production of Canada last year has been issued by the Geological Survey. The total value is placed at $23,627,305. as against $22,000,000 in 1895. The value of the metal is given at $8,039,640, made up as follows: Copper (fine in ore, etc.), 9,385,556 pounds, $1,021,-148; gold, $2,810,206; iron ore, 88,206 tons, $184,313; lead (fine in ore, etc.), 24,199,977 pounds, $721,384; nickel (fine in ore, etc.), 3,500,000 pounds, $1,155,000; silver (fine in ore, etc.), 3,205,343 ounces, $2,147,589; total metallic, $8,039,640. The value of non-metallic minerals totals $15,-087,665, the chief items being coal, 3,743,-234 tons, value $8,006,305, and petroleum, 726,822 barrels, value $1,155,646.

The official statistical statement shows increases in the production of coal, copper, gold, lead and silver, while the output of iron ore, natural gas ($276,301) and nickel, has fallen off to a considerable extent. The increase in coal is altogether due to Nova Scotia, which produced 296,153 net tons more than in 1895, but this increased output is offset in a large measure by a decrease of 104,629 tons in the production of British Columbia.

Copper shows a large decrease in Ontario, and a small increase in Quebec, while British Columbia's contribution is 3,818,556 lbs., which amount is 1,848,193 lbs. more than in 1895. In gold large increases are to be credited to Nova Scotia and Ontario, but British Columbia heads the list with an increase over the previous year of $497,675.

Owing to the dull state of the iron market during the year, the production of iron ore has fallen off to a considerable extent in all the provinces with the exception of Ontario. The exception is directly due to the erection of the blast furnace at Hamilton, Ont., the company obtaining all the Canadian ores smelted from that province.

The production of lead is altogether that of British Columbia, and has increased in the year by over 1,000,000 lbs., but a decrease in the market price of some 8 per cent. lessens the total value by $28,582.

Natural gas shows a decrease in value of $147,761, or about 34 per cent., which would seem to be due to a heavy falling off in the production of the Welland gas field.

Ontario's nickel production is reduced during the year by nearly 400,000 lbs., and shows a decrease in value of over $200,000.

British Columbia shows an output of silver amounting to 3,135,343 ounces, valued at $2,100,689, an increase during the past 12 months of 1,429,660 ounces in quantity and in value of nearly a million dollars.

The statistics have been prepared under the direction of Mr. E. Drew Ingall, Mining Engineer of the Geological Survey.

A new source of power is utilized in an engine invented by Hermann Pappe of Hamburg, Germany. The most peculiar feature of it is that the material producing the power can be used continuously, without a single renewal. A mixture of ammonia vapor and carbonic acid gas, eventually under access of steam, which, however, is not necessary, is employed, so that, by the expansion of the gas mixture entering under pressure, a cooling of the vapors in the cylinder of the engine is produced. Thus, a salt of ammonia is formed by a smaller or larger part of the gas mixture. The salt is returned to a disintegrating apparatus, working under pressure, in order to be disintegrated by heat into its volatile components, whtch are again utilized for power purposes.

ONTARIO COAL.

A VALUABLE FUEL IS THE SUDBURY COAL—COAL NEAR KINGSTON.

ON the 27th ult., at the Canadian Institute, Dr. Ellis read a joint paper by himself and Mr. W. Lawson entitled "Chemical Notes on the So-Called Sudbury Coal." Specimens of the substance, carefully selected and freed as much as possible from ash, gave the following as the mean of several closely concordant analyses: Carbon, 94.92 per cent.; hydrogen, 0.52 per cent.; nitrogen, 1.04 per cent.; sulphur, 0.31 per cent.; oxygen, 1.69 per cent.: ash, 1.52 per cent.

There was also analyzed a specimen of "anthraxolite," from the neighborhood of Kingston, with the following results: Carbon, 90.25 per cent.; hydrogen, 4.16 per cent.; nitrogen, 0.52 per cent.; sulphur, 0.66 per cent.; oxygen, 3.69 per cent.; ash, 0.72 per cent.

It will be noticed that the percentage of hydrogen in the Sudbury mineral is much less than in the Kingston anthraxolite. This small percentage of hydrogen is the most striking feature in the analysis of the Sudbury coal.

Messrs. Ellis and Lawson also determined the heating power of the Sudbury coal, and found that one gramme in burning gives out 7,572 calorics, or one pound 14,198 British thermal units, or enough heat to evaporate 14½ pounds of water.

This quantity of heat is not far from that evolved by a good anthracite coal in burning, but it must be remembered that the sample employed was picked, and contained only 4 per cent. ash. Large samples from the surface contain from 20 per cent. to 30 per cent. ash, and their heating power is correspondingly lower. The mineral burns very slowly.

The paper on the Sudbury mineral was preceded by a brief outline of the theory of the formation of coal from vegetable matter, illustrated by lantern slides. The coal which formed the subject of the paper is found in an area described in Geological Survey reports as "blackish silicious volcanic breccia, and black slate in places." At the time the locality was visited (end of June and early in July last year), the coal appeared to occur in a vein, dipping about 30 degrees to the east, and was at the point stripped about 10 feet wide. Intermixed with the coal there is in places a considerable amount of quartz, and occasionally a little iron pyrites. The quartz forms sometimes a network, in which rectangular fragments of coal are imbedded; in other places the coal is almost entirely free from quartz. The mineral has a lustre like anthracite, only higher; hardness nearly 4. This is considerably harder than ordinary anthracite, which has hardness of 2--2.5, the specific gravity, as determined by Mr. Lawson, 1,865, the specific gravity of anthracite being 1.4—1.7. The average of 10 commercial samples of anthracite from the western middle coal fields of Pennsylvania, was found to be 1.658; from the other coal fields less (Penn. Geol. Sur., 1895, p. 1929). Rhode Island anthracite has a specific gravity of 1.81 (Dana).

A mineral classed as anthracite, and closely resembling the Sudbury mineral, was found near Lake Onega, Russia. The lustre is described as adamantine metallic. Its hardness is 3.5—4, specific gravity 1.84, and chemical composition similar to the Sudbury coal (Naumann Mineralogie). The hardness and specific gravity of this interesting