

GEOLOGICAL AND NATURAL HISTORY SURVEY OF CANADA.
ALFRED R. C. SELWYN, C.M.G., LL.D., F.R.S., DIRECTOR.

CHEMICAL CONTRIBUTIONS

TO THE

GEOLOGY OF CANADA,

FROM THE

LABORATORY OF THE SURVEY.

BY

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ALFRED R. C. SELWYN, C.M.G., LL.D., F.R.S.,

Director of the Geological and Natural History Survey of Canada.

SIR,—I have the honor of herewith laying before you my Report upon the work carried out in the Laboratory of this Survey since the date of my last. During the period embraced by this report, seven hundred and twenty-one mineral specimens were received—brought or sent—for identification or for information in regard to their possible economic value. This entailed a very appreciable amount of work, the nature of which was, in the main, of no great interest except to those immediately concerned. Only such examinations and analyses are here recorded as were deemed likely to prove of general interest.

Mr. F. D. Adams having been for about the space of nine months engaged in the discharge of other duties, in connection with the Indian and Colonial Exhibition, the time devoted by him to chemical work was necessarily very limited. A very large proportion of the results here formulated were obtained by Mr. E. B. Kenrick.

Such examinations or analyses as were carried out by these gentlemen have in all instances been duly credited to them: those not otherwise designated were made by myself.

I have the honor to be,

Sir,

Your obedient servant,

G. CHRISTIAN HOFFMANN.

OTTAWA, December 31, 1886.



CHEMICAL CONTRIBUTIONS
 TO THE
 GEOLOGY OF CANADA,
 FROM THE
 LABORATORY OF THE SURVEY.

MISCELLANEOUS MINERALS.

NATIVE PLATINUM.

The earliest reference to the finding of native platinum in Canada is that by Dr. T. Sterry Hunt, in the Report of Progress of the Geological Survey of Canada for the year 1851-2, p. 120. He there mentions that it had been observed by him, in association with osmiridium, in the gold washings of the Rivière du Loup; likewise, that specimens had been submitted to him which were reported to have been found under like conditions in the Rivière des Plantes, which, together with the preceding locality, is in the county of Beauce, Province of Quebec.

It has since been met with, according to Dr. G. M. Dawson, in association with alluvial gold, in several of the streams of British Columbia, not the least noticeable in this regard being that from which the specimen under consideration was obtained, viz., Granite Creek, a branch of the Tulameen or North Fork of the Similkameen River. This specimen, which was presented to the Survey by T. Elwyn, Esq., Deputy Provincial Secretary of British Columbia, has been examined by me, and with the results hereinafter stated.

It weighed 18.266 grams, of which 17.894 grams consisted of native platinum and the remainder of rock-matter, magnetite, a little pyrite, and a few flakes of native gold. The material being made up as follows:—

Native platinum	97.963
Gold	0.225
Pyrite	0.219
Rock matter	1.593
	100.000

Native platinum.

Localities of occurrence of, in the Province of Quebec.

Localities of occurrence of, in British Columbia.

Analysis of specimen of, from Granite Creek, British Columbia.

Analysis of
specimen of
native
platinum from
Granite Creek,
British
Columbia, cont.

The platinum was in the form of grains and pellets varying in size from half a millimetre to eight millimetres in diameter, and in weight from three milligrams to eight decigrams. The grains measuring less than one millimetre constituted but a very small proportion of the whole, there were only a few pellets measuring five millimetres, and but two measuring eight millimetres, the bulk of the material being made up of grains varying in size from one to four millimetres in diameter. The grains, which were all very much rounded off as though from attrition, had a lead-grey color and sub-metallic lustre, they were all more or less tarnished, and the greater number contained inclusions of chromite. A certain proportion of the same proved to be readily attracted by the magnet, and of these all such as were tried were found to possess polarity. After treatment with dilute hydrochloric acid, which removed a little iron, the grains had a steel-grey color and metallic lustre. The particles of foreign matter having been carefully eliminated, the material, as a whole, was found to have a specific gravity (temp. 15.5° C.) of 16.656.

The ore was separated by means of the magnet into two distinct portions, a non-magnetic and a magnetic; the latter constituted 37.88 per cent., by weight, of the whole.

Portion I.—Non-Magnetic.

This weighed 11.115 grams and had a specific gravity (temp. 15.5° C.) of 17.017. The grains and pellets composing it were of very irregular shape: about one-third, by weight, of the same had comparatively smooth surfaces, and were apparently quite free from any foreign inclusions, the remainder were all more or less pitted, and in most instances contained a little imbedded chromite. For the purpose of analysis, this material was divided into several sub-portions. Adding together the weights of the material constituting each sub-portion, as likewise those of each of the various constituents found, calculation showed the composition of this portion of the ore, as a whole, to be as follows:—

Platinum	68.19
Palladium	0.26
Rhodium	3.10
Iridium	1.21
Osmium	—
Copper	3.09
Iron	7.87
Osmiridium	14.62
Gangue (imbedded chromite)	1.95

100.29

The osmiridium was partly in the form of minute steel-grey colored scales of bright metallic lustre, and partly as a heavy, light steel-grey colored powder; there were also a few small, tolerably firm, skeleton aggregations of minute scales, likewise some minute, almost microscopic, tin-white grains, and some six or seven tin-white, cavernous nodules varying in size from two to three millimetres in diameter. The grains and nodules, which amounted to about fifty-five per cent. of the whole, had a specific gravity of 18.742 (15.5° C.)

Analysis of specimen of native platinum from Granite Creek, British Columbia, cont.

Portion II.—Magnetic.

Weighed 6.779 grams, had a specific gravity (temp. 15.5° C.) of 16.095, and was, as already stated, magneti-polar. The grains and pellets composing it were, as in the previous instance, of very irregular shape: very few had perfectly smooth surfaces, by far the greater number being more or less pitted and containing inclusions of chromite. This material was, for the purpose of analysis, divided into two sub-portions. Adding together the weights of the material comprising these two sub-portions, also the amounts found of each of the several constituents, calculation showed this portion of the ore, as a whole, to contain:—

Platinum	78.43
Palladium	0.09
Rhodium	1.70
Iridium	1.04
Osmium	—
Copper	3.89
Iron.....	9.78
Osmiridium.....	3.77
Gangue (imbedded chromite)	1.27
	<hr/>
	99.97

The osmiridium was in this instance present, exclusively, in the form of minute, thin, shining, steel-grey colored scales.

On comparing the analysis of the non-magnetic with that of the magnetic portion, it will be seen that the latter contained much less palladium and rhodium and very considerably less included osmiridium, but contained somewhat more copper, nearly two per cent. more iron, and a little over ten per cent. more platinum than the former. That the magnetic property of Portion II. was dependant upon the amount of iron which it contained may be questioned, in view of the fact that one of the sub-portions of the non-magnetic portion, and which was not in the slightest degree magnetic, contained 8.90 per cent. of iron, whereas one of the sub-portions of Portion II.,

and which was found to be magneti-polar, contained but 9.35 per cent. of iron, a difference of only 0.45 per cent.

The weights of the material constituting the sub-portions having been added together, as likewise the amounts of each of the several constituents found in these sub-portions, calculation showed the composition of this ore—after careful separation of the associated grains of foreign matter—taken as a whole, as determined upon the 17.894 grams material, to be as follows:—

Platinum	72.07
Palladium	0.19
Rhodium	2.57
Iridium.....	1.14
Osmium	—
Copper	3.39
Iron.....	8.59
Osmiridium.....	10.51
Gangue (imcedded chromite)	1.69
	<hr/>
	100.15

In common with the native platinum of Oregon and Australia, this ore contains a large proportion of osmiridium, but differs from the material of those localities in that it contains a higher percentage of copper and iron, in which regard it more nearly approaches in composition to some Russian specimens of this mineral.

The following analyses of platinum ores, by Deville and Debray, are given for comparison with the foregoing, from which, it must be remembered, the associated gold was separated prior to analysis:—

	1	2	3	4	5
Platinum	51.45	61.40	85.50	86.20	76.40
Palladium.....	0.15	1.80	0.60	0.50	1.40
Rhodium.....	0.65	1.85	1.00	1.40	0.30
Iridium.....	0.40	1.10	1.05	0.85	4.30
Copper	2.15	1.10	1.40	0.60	4.10
Iron	4.30	4.55	6.75	7.80	11.70
Gold	0.85	1.20	0.80	1.00	0.40
Osmiridium.....	37.30	26.00	1.10	0.95	0.50
Sand.....	3.00	1.20	2.95	0.95	1.40
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	100.25	100.20	101.15	100.25	100.50

1. Oregon, North America. 2. Australia. 3. California, North America. 4. Choco, South America. 5. Nischne Tagilsk, Ural, Russia.

Platinum is, by reason of its inalterability at high temperatures and power of resisting the action of a great number of the most powerful chemical agents, a valuable and useful metal for the manufacture of a

Analysis of specimen of native platinum from Granite reek, British Columbia, cont.

Analysis of platinum ore from Oregon, Australia, California, Choco, and Nischne Tagilsk.

Platinum, economic uses of.

great many forms of chemical apparatus, such as retorts, crucibles, evaporating dishes, etc., etc. Large platinum vessels are also used in manufacturing operations on the large scale, more especially in the form of stills for the concentration of the acid in sulphuric acid works. Osmiridium is employed for tipping the nibs of gold pens, constituting the so-called "diamond point." For this purpose it is necessary that it should be in the form of natural grains, and these are very carefully selected, the requirements being that they should be solid, compact, and of the proper size and shape. An ore having the composition of the one here in question would, at this present time, be worth from \$2.92 to \$3.65 per ounce, troy, in the English market. The osmiridium, as occurring in it, was not in a form suitable for the purposes above specified.

Platinum,
economic uses
of, cont.

Osmiridium,
economic
uses of.

NATIVE ARSENIC.

A specimen of what proved to be native arsenic, weighing about half a pound, was forwarded to the Survey in August last by Mr. W. F. McCulloch, of Victoria, who informed me that it was stated to have been found on the western bank of the Fraser River, a short distance above Lillooet, British Columbia.

Native arsenic
from the
Fraser River,
British
Columbia.

CINNABAR.

In his report on the mines and minerals of British Columbia, Report of Progress 1876-77, pp. 103-149, Dr. G. M. Dawson states that it appears certain that small quantities of cinnabar have been obtained in gold-washing on the Fraser River, near Boston Bar; that in the autumn of 1876 he received a small but well authenticated specimen of rich cinnabar ore from Mr. Tiedemann, found by that gentleman in the vicinity of the located line of railway on the Homathco River; and further, that he has seen a rich specimen of cinnabar and native mercury said to have been found on the west side of the Fraser River, near Clinton. In August last, Mr. A. J. Hill, C.E., of New Westminster, sent to the Survey a rich specimen of cinnabar reported to have been found (loose) in the immediate vicinity of that place.

Cinnabar.

Localities of
occurrence of,
in British
Columbia.

The present specimen was collected, during the past season, by Mr. R. G. McConnell. It came from the Ebenezer Mine, Hector (Kicking Horse) Pass, two and a-half miles east of Golden City, Rocky Mountains, British Columbia, and consisted of a white, fine crystalline granular limestone, through which was disseminated small quantities of a bright-red colored cinnabar and minute crystals of iron pyrites.

A portion of the specimen was submitted to assay; the results showed it to contain traces of gold, but no silver.

APATITE.

Apatite from
Eabamet Lake,
Albany River,
Severn District.

The following specimen was collected (1886) by Dr. R. Bell, on the north side of Eabamet Lake, Albany River, Severn District. It consisted of small hexagonal prisms of from five to seven millimetres in diameter, of bluish-green to sea-green apatite, disseminated through a light colored granite, which is stated by Dr. Bell to constitute veins cutting the micaceous gneiss at the locality in question.

COOKEITE.

Cookeite from
Big Bend,
Columbia
River, British
Columbia.

A micaceous mineral, which may prove to be identical with Cookeite, was found sparsely disseminated, in the form of minute greyish-white pearly scales, through a specimen of galena from the Little Bunting lead, Big Bend, Columbia River, British Columbia (*vide* Gold and Silver Assays, Assay No. 101).

Mr. E. B. Kenrick, who first detected its presence, found that, when heated before the blow-pipe, it exfoliated like vermiculite and colored the flame intense carmine-red; in the closed tube it gave off water, the tube becoming slightly etched; it was slightly fusible, and gave with cobalt solution a blue color; with salt of phosphorus, a skeleton of silica. Insufficiency of material precluded the possibility of a closer examination.

URANINITE, CORACITE AND URACONITE.

Uraninite from
Villeneuve,
Ottawa county,
Province of
Quebec.

Amongst the specimens received in October last for identification was one which on examination proved to be uraninite. It was obtained at the so-called Villeneuve mica mine, which is situate on the thirtieth lot of the first range of Villeneuve, Ottawa county, Province of Quebec. The vein in which the mica occurs has been described as a coarse pegmatite, cutting a greyish garnetiferous gneiss. It is composed of quartz, muscovite, microcline and albite, with occasionally black tourmaline and garnet. The specimen, to which was attached a little muscovite, weighed about one pound, and consisted, apparently, of the greater portion of what had been a lenticular nodule. Structure, massive. Specific gravity (15.5° C.), as determined by Mr. Kenrick, 9.055. It had on one portion of its surface a moderately thick incrustation, the prevailing color of which was yellowish-red to scarlet-red, a small portion of the same had, however, a pure sulphur yellow color. This material, which is most probably gummite, was found by Mr. Kenrick to have a specific gravity (15.5° C.) of 3.78.

Coracite from
Mamainse,
Lake Superior,
Ontario.

Previous to the finding of this specimen, pitch-blende was not known to occur in Canada. Coracite, a closely related mineral, has been met with at Mamainse, east side of Lake Superior, where it is

said to form a vein about two inches in width, at the junction of the trap and syenite (Geology of Canada, 1863). It was first described, and named, in 1847 by Dr. J. L. Leconte, subsequently analysed by Prof. J. D. Whitney in 1849, and again by Dr. F. A. Genth in 1857.

Coracite from
Mamaine,
Lake Superior,
Ontario, cont.

Uraconite, another uranium mineral, is mentioned by Dr. T. S. Hunt (Geology of Canada, 1863) as occurring in the form of a sulphur-yellow crystalline crust, lining fissures in the magnetite of the Seymour ore-bed, lot eleven, range five of Madoc, Hastings county, Ontario; and more recently Prof. E. J. Chapman has noticed the occurrence of the same mineral with magnetite on lot twenty, range one of Snowdon, Peterborough county, also in the Province of Ontario.

Uraconite from
Madoc,
Hastings
county, Ontario.

Uraconite from
Snowdon,
Peterborough
county, Ontario.

Uranium is not a very abundant element. The principal ore is uraninite, which consists of more or less impure uranosio-uranic oxide. It is of economic importance, being employed in chemical operations, for painting on porcelain, and glass-staining.

Uranium,
economic
uses of.

MONAZITE.

This was received almost simultaneously with the last mentioned, and was also obtained at the Villeneuve mica mine, above referred to. It was in the form of a nodular mass, to which was attached a little muscovite and felspar, weighing twelve and a quarter pounds.

Monazite from
Villeneuve,
Ottawa county,
Province of
Quebec.

Structure, compact; color, reddish-brown; lustre, resinous; specific gravity, 5.138 (15.5° C.) Its blow-pipe characters and general composition, as determined by a rough quantitative analysis, conducted by E. B. Kenrick, agree with those of monazite. This specimen will be submitted to analysis, and its exact composition determined.

This is the first time that this interesting mineral has been met with in Canada.

SMALTITE.

This mineral was observed, by Mr. E. B. Kenrick, in the form of minute crystals with well-marked octahedral cleavage, in association with chalcopyrite from the township of McKim, District of Nipissing, Ontario.

Smaltite from
McKim,
District of
Nipissing,
Ontario.

So far as I am aware, this is the first notice of the occurrence of this mineral in Canada.

NATURAL WATERS.

Natural waters.

- 1.—*Saline Water*.—The spring from which this water was taken was struck at a depth of one hundred and fifty feet in sinking for water at a point three miles below the village of L'Assomption, and five hundred yards on the north side of the L'Assomption River, L'Assomption county, Province of Quebec.

Water from
spring near
L'Assomption,
Province of
Quebec.

Water from
spring near
L'Assomption,
Province of
Quebec, cont.

The sample examined, which was received from Dr. Forest, contained a small quantity of chocolate-brown colored suspended matter. This was removed by filtration. The filtered water had a brownish-yellow tinge; was inodorous; had a saline taste exhibited a distinct alkaline reaction with reddened litmus paper, and a slightly alkaline reaction with turmeric paper; when boiled, deposited a copious precipitate consisting, for the most part, of carbonates of lime and magnesia. Total dissolved saline matter, dried at 180° C., equalled 16.85 parts in 1000. The water contained: acids—carbonic acid, chlorine; bases—potassa, soda, lime, magnesia, a little iron, some manganese, and further—baryta, strontia and lithia, which were detached by means of the spectroscope. No other constituents were sought for.

This water belongs to the third class of Dr. T. Sterry Hunt's classification of mineral waters. This class includes such saline waters as contain, besides chloride of sodium, with a little chloride of potassium, a portion of carbonate of soda, with bicarbonates of lime and magnesia. Small amounts of baryta, strontia, iron, manganese, and of boracic and phosphoric acids, are often, and alumina and silica, generally, present in these waters, and bromides and iodides are very rarely wanting.

Water from
spring at Port
Elgin, Bruce
county, Ontario

2.—From a spring at Port Elgin, Bruce county, Ontario. Collected by Mr. A. S. Cochrane.

The water contained a small amount of suspended matter, which consisted almost entirely of ferric hydrate. The filtered water was colorless and odorless, had a specific gravity, at 15.5° C., of 1002.69, and contained 2.925 parts of dissolved saline matter, dried at 180° C., in 1000 parts, by weight, of the water.

A qualitative analysis, by Mr. E. B. Kenrick, showed in to contain:—

Potassa.....	trace.
Soda.....	fairly large quantity.
Lithia.....	trace.
Strontia.....	small quantity.
Lime.....	very large quantity.
Magnesia.....	large quantity.
Ferrous oxide.....	trace.
Sulphuric acid.....	very large quantity.
Phosphoric acid.....	trace.
Silica.....	trace.
Chlorine.....	very large quantity.

Boiling produced but a comparatively small precipitate, which consisted for the most part of lime, with a very small quantity of

magnesia and a trace of iron, also some sulphuric acid and a trace of phosphoric acid.

- 3.—From Dougherty's so-called carbonic acid spring, mountains between Clinton and Carguiles, British Columbia. Collected by Mr. A. Bowman. Water from spring between Clinton and Carguiles, British Columbia.

The water contained some suspended matter, consisting chiefly of carbonate of lime, with some argillaceous and organic matter, and a little ferric hydrate. This having been removed by filtration, the water was found to have a specific gravity, at 15.5° C., of 1000.90, and to contain 1.442 parts of dissolved solid matter, dried at 180° C., in 1000 parts, by weight, of the water.

A qualitative analysis afforded Mr. E. B. Kenrick the following results:—

Potassa.....	trace.
Soda	small quantity.
Lime.....	large quantity.
Strontia.....	trace.
Magnesia.....	large quantity.
Alumina	very small quantity.
Sulphuric acid.....	fairly large quantity.
Carbonic acid	large quantity.
Silica.....	small quantity.
Chlorine.....	small quantity.
Organic matter.....	small quantity.

Boiling produced a copious precipitate, which contained a large quantity of lime, a fairly large quantity of magnesia, a very small quantity of alumina, and a trace of strontia; a large quantity of carbonic acid and a small quantity of sulphuric acid.

- 4.—From so-called sulphur spring on Sulphur Coulée, near its junction with the Pembina River. Procured by Dr. G. M. Dawson, who informs me that it issues from shales of Cretaceous age. The springs represented by this, and the following water, are referred to by him in his Report on the Geology and Resources of the 49th Parallel, 1875, p. 146. Water from spring on Sulphur Coulée, Pembina River, Manitoba.

This water contained a certain amount of suspended and sedimentary matter, consisting of carbonate of lime, with traces of magnesia and ferric hydrate, some argillaceous and organic matter, and a little sand. This was removed by filtration. The filtered water had a specific gravity, at 15.5° C., of 1000.42, and contained 0.862 parts dissolved saline matter, dried at 180° C., in 1000 parts, by weight, of the water.

Water from
spring on
Sulphur Coulee,
Pembina River,
Manitoba, cont.

Agreeably with the results of a qualitative analysis, made by
Mr. E. B. Kenrick, it contained :—

Potassa.....	small quantity.
Soda	rather large quantity.
Lithia.....	very small quantity.
Lime.....	large quantity.
Magnesia	large quantity.
Sulphuric acid	large quantity.
Carbonic acid.....	large quantity.
Chlorine.....	large quantity.
Organic matter.....	small quantity.

Boiling produced only a very slight precipitate, which consisted mainly of carbonates of lime and magnesia, together with a little sulphate of lime.

Water from
spring at
foot-hills of
Western Butte,
North-West
Territory.

5.—From spring at foot-hills of Western Butte, Sweet Grass Hills, District of Alberta, North-West Territory. Procured by Dr. G. M. Dawson, who informs me that it rises from dark shales of Cretaceous age.

The water, which as it issues from the spring is charged with sulphuretted hydrogen, still contained a large quantity of that gas. It contained some suspended and sedimentary matter, consisting of carbonate of lime, a little iron, and separated sulphur, together with argillaceous and organic matter, and some sand. The filtered water had a specific gravity, at 15·5° C., of 1001·36. Total dissolved saline matter, dried at 180° C., equalled 0·857 parts in 1000.

Mr. E. B. Kenrick made a qualitative examination of the water, and found it to contain :—

Potassa.....	trace.
Soda	small quantity.
Lithia	very distinct trace.
Lime.....	fairly large quantity.
Magnesia	very large quantity.
Alumina	very small quantity.
Ferrous oxide.....	trace.
Sulphuric acid	small quantity.
Carbonic acid	very large quantity.
Chlorine.....	small quantity.
Hydrosulphuric acid	large quantity.
Organic matter.....	small quantity.

Boiling produced a very copious precipitate, containing a somewhat large quantity of lime, a very large quantity of magnesia, a little alumina and a trace of iron, together with a very large quantity of carbonic acid and a trace of sulphuric acid.

6.—Water from hot spring one and a-half miles north of the north end of Upper Columbia Lake, Columbia Valley, British Columbia. Collected by Dr. G. M. Dawson.

Water from hot spring near Upper Columbia Lake, British Columbia.

This gentleman informs me that "the spring is about half a mile east of the trail, on the slope of a hill, and issues in several places from the summit and sides of a rounded, calcareous knoll formed by its deposit. The main efflux, at the summit of the knoll, has produced a raised basin, which within measures about eight by four feet, and is two feet deep, forming an admirable natural bath. The discharge at this place is probably not less than twenty gallons per minute, and the temperature of the water at this, the hottest, point was found to be 112° F. There is no discharge of gas, but the water has a slight styptic saline taste."

This water was found to have a specific gravity, at 15.5° C., of 1001.48, and to contain 2.177 parts of dissolved saline matter, dried at 180° C., in 1000 parts, by weight, of the water.

A qualitative analysis, conducted by Mr. E. B. Kenrick, showed it to contain:—

Potassa.....	trace.
Soda.....	rather small quantity.
Lithia ..	trace.
Baryta.....	trace.
Strontia.....	very small quantity.
Lime.....	very large quantity.
Magnesia.....	large quantity.
Ferrous oxide.....	trace.
Sulphuric acid.....	very large quantity.
Carbonic acid.....	large quantity.
Silica.....	trace.
Chlorine.....	fairly large quantity.
Organic matter.....	small quantity.

On boiling it deposited a very copious precipitate, which on examination was found to contain a very large quantity of lime, a small quantity of magnesia, a very small quantity of strontia, and traces of baryta and iron, together with large quantities of sulphuric and carbonic acids.

This water may not improbably be found to possess therapeutic properties, and hence be worthy of notice as a remedial agent.

IRON ORES.

Iron Ores.

1.—Magnetic iron-ore from the Belvedere iron mine, lot eight of the ninth range of Ascot, county of Sherbrooke, Province of Quebec. Collected by Mr. R. W. Ells. Examined for Mr. E. Clark.

Magnetite from the Belvedere mine, Sherbrooke county, Province of Quebec.

Magnetite from the Belvedere mine, Sherbrooke county, Province of Quebec, cont.

A fine granular ore of a purplish, dark-grey color. The magnetite, which is very fine-crystalline, is very evenly disseminated through the gangue. It is said to form a very extensive deposit. A partial analysis, by Mr. F. D. Adams, gave (after drying at 100° C.—Hygroscopic water = 0.056 per cent.) the following results:—

Ferric oxide.....	26.669
Ferrous oxide	12.502
Titanium dioxide.....	none.
Insoluble matter.....	45.794
	<hr/>
Metallic iron, total amount of.....	28.392

In view of the small percentage of iron, determinations of phosphoric acid and sulphur were not carried out.

Magnetite from 2.—Magnetic iron-ore from the Leduc mine, Ottawa county, Province of Quebec.

sixth range of Wakefield, county of Ottawa, Province of Quebec. Examined for Mr. J. Lambe.

Structure, compact: color, greyish-black: lustre, metallic: strongly magnetic. Determinations—by Mr. E. B. Kenrick—of the more important constituents gave (after drying at 100° C.—Hygroscopic water = 0.069 per cent.) the following results:—

Ferric oxide.....	64.593
Ferrous oxide	30.819
Titanium dioxide.....	trace.
Phosphoric acid	0.027
Sulphur	—
Insoluble matter.....	1.551
	<hr/>
Metallic iron, total amount of.....	69.185
Phosphorus	0.012

Magnetite from 3.—Magnetic iron-ore from about two and a-half miles south of the village of St. Jerome, Terrebonne county, Province of Quebec.

village of St. Jerome, on the west side of the North River, county of Terrebonne, Province of Quebec.

It was somewhat coarsely crystalline, and possessed an indistinct banded structure. It was found—by Mr. F. D. Adams—to contain (after drying at 100° C.—Hygroscopic water = 0.058 per cent.) as follows:—

Ferric oxide.....	59.059
Ferrous oxide.....	26.807
Titanium dioxide.....	none.
Phosphoric acid	0.015
Sulphur.....	0.001
Insoluble matter.....	9.897
	<hr/>
Metallic iron, total amount of.....	62.191
Phosphorus	0.007
Sulphur	0.001

The proportions of ferric and ferrous oxide are very nearly those required by theory for magnetite, the ratio of ferrous to ferric oxide being 1 : 2·20 instead of 1 : 2·22.

- 4.—Magnetic iron-ore from the vicinity of Little Gull Lake, District of Thunder Bay, Lake Superior, Ontario. Received by Mr. E. D. Ingall from Mr. P. Laplante. Magnetite from Little Gull Lake, District of Thunder Bay, Ontario.

Structure, compact; color, dark steel-grey. A partial analysis, by Mr. E. B. Kenrick, showed it to contain (after drying at 100° C.—Hygroscopic water = 0·195 per cent.) as follows:—

Ferric oxide.....	55·455
Ferrous oxide	18·272
Titanium dioxide.....	none.
Insoluble matter.....	23·450
Metallic iron, total amount of.....	53·030

- 5.—Magnetic iron-ore from the mining location of Mr. McLennan on Rainy Lake, near the mouth of the Seine River, Ontario. Collected by Mr. A. C. Lawson, who informs me that it occurs in green schists of presumed Huronian age. Magnetite from Rainy Lake, Ontario.

Structure, compact; color, faint purplish greyish-black—many specimens exhibit a greenish tinge, due to the presence of a greenish chloritic mineral which is disseminated through this ore. Readily attracted by the magnet. Agreeably with the results of a partial analysis, conducted by Mr. E. B. Kenrick, it contained (after drying at 100 C.—Hygroscopic water = 0·060 per cent.) as follows:—

Ferric oxide.....	27·277
Ferrous oxide	32·089
Titanium dioxide.....	21·378
Insoluble matter.....	10·436
Metallic iron, total amount of.....	44·052

- 6.—Magnetic iron-ore from the Sooke iron mine, on the Strait of Juan de Fuca, Vancouver Island, British Columbia. The specimens in question were received from the Minister of Mines. The determinations of the iron were made by Mr. E. B. Kenrick. Magnetite from Sooke iron mine, Vancouver Island, British Columbia.

I.—Consisted of an intimate mixture of a very fine crystalline magnetite and earthy hematite: it contained a somewhat large amount of iron-pyrites.

Metallic iron..... 58·49 per cent.

II.—A very fine crystalline magnetite.

Metallic iron..... 55·83 per cent.

Magnetite from
Sooke iron
mine,
Vancouver
Island, British
Columbia, cont.

III.—A fine crystalline magnetite, through which was disseminated a somewhat large amount of iron-pyrites.

Metallic iron..... 63·64 per cent.

IV.—A fine crystalline magnetite.

Metallic iron..... 63·57 per cent.

V.—A very fine crystalline magnetite.

Metallic iron..... 48·94 per cent.

VI.—Magnetite, together with a little copper-pyrites, in a gangue consisting almost exclusively of actinolite.

Metallic iron..... 28·28 per cent.

VII.—A fine crystalline magnetite, through which was disseminated a little iron-pyrites.

Metallic iron..... 59·06 per cent.

VIII.—A very fine crystalline magnetite.

Metallic iron..... 52·03 per cent.

Hematite from
South Crosby,
Leeds county,
Ontario.

7.—Red hematite from the nineteenth lot of the ninth range of South Crosby, about one mile from Chaffey locks, Rideau Canal, Leeds county, Ontario. Examined for Mr. N. Brown. The specimen examined had a somewhat large amount of calcite disseminated through it. Mr. E. B. Kenrick found it to contain:—

Metallic iron..... 28·14 per cent.

Magnetite from
Stephen C. E.
Smith mine,
Sherbrooke
county,
Province of
Quebec.

8.—Magnetic iron-ore from the Stephen E. Smith mine, lot twenty-one of the sixth range of Ascot, Sherbrooke county, Province of Quebec. Collected by Mr. R. W. Ells, who informs me that it constitutes an extensive deposit.

Massive, very fine crystalline; color, greyish-black with a greenish tinge. Mr. E. B. Kenrick has made a partial analysis of this ore, determining the more important constituents, and found it to contain (after drying at 100° C.—Hygroscopic water = 0·216 per cent.) as follows:—

Ferric oxide.....	49·776
Ferrous oxide	24·725
Titanium dioxide.....	none.
Phosphoric acid	1·512
Sulphur.....	·024
Insoluble matter.....	11·235
Metallic iron, total amount of	54·074
Phosphorus.....	·660
Sulphur.....	·024

9.—Hematites and limonites from Big Island, Lake Winnipeg, Manitoba. Received from Mr. F. Proudfoot.

	I.	II.	III.	IV.	V.
Ferric oxide.....	77·13	50·37	73·64	39·34	17·19
Water { hygroscopic ...	·16	·91	4·74	1·20	·36
{ combined	—	—	13·57	6·45	undet.
Insoluble matter.....	3·90	14·80	2·23	48·12	77·03
Metallic iron.....	53·99	35·26	51·55	27·54	12·03

Hematite and limonite from Big Island, Lake Winnipeg, Manitoba.

I.—Hematite, botryoidal : gangue, calcite with a little quartz.

II.—Hematite, ochreous : gangue, calcareous and siliceous.

III.—Limonite.

IV.—Limonite, through which was disseminated rounded grains of quartz.

V.—Quartz, with limonite and a little hematite.

COPPER ORES.

Copper Ores.

1.—From the Sooke copper-mine, on the Strait of Juan de Fuca, Vancouver Island, British Columbia. Received from the Minister of Mines.

Cupiferous rock from Sooke, Vancouver Island, British Columbia.

The specimen examined consisted of a dark-green chloritic rock, through which was disseminated very thin scales of native copper. Agreeably with the results of a determination made by Mr. E. B. Kenrick, it contained :—

Copper..... 1·02 per cent.

2.—From the township of McKim, District of Nipissing, Ontario.

Copper-pyrites from McKim, District of Nipissing, Ontario.

A specimen of what, at a first glance, appeared to be a very pure copper-pyrites—but which on close examination was found to contain a very appreciable amount of rock-matter and magnetic-pyrites disseminated through it—from this locality was examined by Mr. E. B. Kenrick and found to contain :—

Copper..... 24·62 per cent.

MANGANESE ORES.

Manganese Ores.

I.—Bog manganese from the head of Lewis Bay, Grand Mira, Cape Breton county, Nova Scotia. Examined for Dr. M. A. McDonald.

Bog manganese from Lewis Bay, Cape Breton county, Nova Scotia.

The sample was in the form of porous friable lumps, varying in color from dark-brown to brownish-black. A partial analysis of the same—after drying at 100° C.—Loss by moisture = 22·22 per cent.—afforded Mr. E. B. Kenrick the following results :—

Manganese dioxide—available..... 44·99 per cent.

Insoluble matter..... 12·25 “

GOLD AND SILVER ASSAYS.

Gold and Silver
Assays.*These were, with one exception, all conducted by Mr. E. B. Kenrick.*

LABRADOR.

Labrador.

- 1.—From first cove south side of Nachvak Inlet. Collected by Dr. R. Bell.

A white translucent quartz, in parts stained with hydrated peroxide of iron, with here and there small quantities of a bright green chloritic mineral. The sample, which consisted of five fragments, weighed two pounds six ounces.

It contained neither gold nor silver.

- 2.—From the south side of Nachvak Inlet, opposite Skynner's Cove. Collected by Dr. R. Bell.

A white sub-translucent quartz, seamed and, in parts, stained with hydrated peroxide of iron. Weight of specimen, three and a-half pounds. It was found to contain:—

Gold..... trace.

Silver..... 0.041 of an ounce to the ton of 2,000 lbs.

PROVINCE OF NOVA SCOTIA.

Province of
Nova Scotia.

- 3.—From Pleasant Bay, Inverness county. Examined for Mr. J. D. Ferguson.

A dark-grey limestone, carrying a little galena. Weight of specimen, five pounds two and a-half ounces.

It contained neither gold nor silver.

- 4.—This and the five following specimens are from exposures on the Sissiboo River, about seven miles above Weymouth, Digby county. They were examined for Mr. J. Robertson.

From old camp.—A faintly pinkish-white sub-translucent quartz, associated with a small quantity of a dark bluish-grey shale. Some fragments were, in parts, coated with hydrated peroxide of iron, and also contained cavities holding the same material. Weight of specimen, six pounds one ounce.

It contained neither gold nor silver.

- 5.—From foot of new road.—A milky white quartz, associated with a dark bluish-grey shale. Some of the fragments contained a trifling amount of iron-pyrites, and were more or less stained with hydrated peroxide of iron. Weight of specimen, nearly four pounds.

It contained neither gold nor silver.

- 6.—From foot of Schooner passage.—A faintly greyish-white quartz, in association with a dark bluish-grey shale. It contained a small quantity of iron-pyrites, and was, in parts, coated with hydrated peroxide of iron. Weight of specimen, five and three quarter pounds.

Gold and Silver Assays, cont.

Province of Nova Scotia, cont.

It contained neither gold nor silver.

- 7.—From head of Schooner passage.—A white sub-translucent quartz, associated with a small amount of a dark bluish-grey shale. It contained a trifling amount of iron-pyrites, and was in parts stained with hydrated peroxide of iron. Weight of specimen, six and a-quarter pounds.

It contained neither gold nor silver.

- 8.—From Wagner's Rips.—An association of white and grey quartz, and dark bluish-grey shale. It contained a small quantity of iron-pyrites, numerous cavities lined with hydrated peroxide of iron, and was also, in parts, coated with the latter material. Weight of specimen, six and three-quarter pounds.

It contained neither gold nor silver.

- 9.—From Gates No. 4.—A white quartz, in association with a dark bluish-grey shale. It contained a little iron-pyrites, and was more or less coated with hydrated peroxide of iron. Weight of specimen, twelve and a-half pounds.

It contained neither gold nor silver.

PROVINCE OF QUEBEC.

- 10.—From the first lot of the tenth range of South Metgermette, county of Beauce.

Province of Quebec.

It consisted of a white quartz, in parts stained with hydrated peroxide of iron, associated with a small quantity of chloritic matter, and containing, here and there, a few specks of iron-pyrites. Weight of specimen, seven ounces.

It contained neither gold nor silver.

- 11.—From the township of Risborough, county of Beauce.

An association of galena, copper-pyrites, iron-pyrites, and small quantities of tetrahedrite and magnetic-pyrites, in a gangue of white translucent quartz. Weight of specimen, one pound eight ounces. It contained:—

Gold..... traces.

Silver..... 43·633 ounces to the ton of 2,000 lbs.

Gold and Silver Assays, cont.
Province of Quebec, cont.

12.—From the tenth lot of the tenth range of Wakefield, county of Ottawa. Examined for Mr. W. A. Allan.
A white translucent quartz in association with a little felspar. It was found to contain:—

Gold minute trace.
Silver none.

13.—From veins traversing the Gaspé limestone at Indian Cove, two and a-half miles from Ship Head, Gaspé Bay, Gaspé county.
The occurrence of galena at this place has been referred to in the Geology of Canada, 1863, pp. 400, 516 and 691, and more recently in the Report of Progress for 1880–81–82, p. 15 *nd*. The specimen, which weighed four and a-half ounces, was collected by Mr. A. P. Low. It consisted of a somewhat coarse crystalline galena, in association with a very trifling amount of calcite. Assays gave:—

Gold..... none.
Silver..... 0·146 of an ounce to the ton of 2,000 lbs.

NORTH-EAST TERRITORY.

14.—From veins at Stupart's Bay, south side of Hudson's Strait. Collected by Dr. R. Bell.
A white, sub-translucent to translucent quartz carrying iron-pyrites; some of the fragments were much stained with hydrated peroxide of iron. Weight of specimen, three pounds nine ounces. Assays gave:—

Gold trace.
Silver none.

15.—From Port Burwell, Cape Chudleigh, Hudson's Strait. Collected by Dr. R. Bell.
A greyish-white sub-translucent quartz, with which was associated a little barite, carrying small quantities of pyrite; some of the fragments were stained and coated with hydrated peroxide of iron. Weight of specimen, one pound fifteen ounces. It was found to contain:—

Gold trace.
Silver none.

HUDSON'S BAY.

Hudson's Bay. 16.—Veinstone from small veins cutting diorite, Ottawa Islet. Collected by Dr. R. Bell.

An intimate association of calcite and plagioclase, containing, ^{Gold and Silver Assays, cont.} here and there, a few specks of iron-pyrites. Weight of specimen, one pound thirteen ounces. Assays showed it to contain:—

Gold..... distinct trace.

Silver..... 0.069 of an ounce to the ton of 2,000 lbs.

PROVINCE OF ONTARIO.

Of the following specimens, Nos. 17 to 50, inclusive, were collected by ^{Province of Ontario.} *Mr. E. D. Ingall.*

17.—Wall rock from a vein at Little Trout Bay.

A dark-greyish, highly siliceous rock, through which was disseminated a small quantity of iron-pyrites. Weight of specimen, seven and a-half ounces.

It contained neither gold nor silver.

18.—Veinstone from foregoing vein.

Barite associated with a little quartz; it was, in parts, slightly stained with hydrated peroxide of iron. Weight of specimen, six ounces.

It contained neither gold nor silver.

19.—From a vein at the eastern end of Jarvis Island, north-west shore of Lake Superior, between Thunder Bay and Pigeon River.

It consisted of barite. Weight of specimen, seven and a-half ounces.

It contained neither gold nor silver.

20.—From a vein at the western end of Jarvis Island. A selected specimen.

An association of calcite, barite and iron-pyrites. Weight of specimen, ten ounces.

It contained neither gold nor silver.

21.—From a vein on Prince's location. A selected specimen.

An association of calcite and quartz, carrying a little galena. Weight of specimen, one pound eleven ounces.

It contained neither gold nor silver.

22.—From a vein east of the one last mentioned.

A coarse crystalline calcite associated with a little quartz; it contained, here and there, a few specks of bornite and chalcocite. Weight of specimen, ten ounces.

It contained neither gold nor silver.

Gold and Silver
Assays, cont.Province of
Ontario, cont.

- 23.—From a vein at the northern end of Spar Island, Thunder Bay, Lake Superior.

An association of calcite and barite, carrying small quantities of copper-pyrites, copper-glance, bornite and zinc-blende. Weight of specimen, four and a-half ounces. It contained :—

Gold distinct traces.
Silver..... 2·158 ounces to the ton of 2,000 lbs.

- 24.—From a vein about the middle of the south shore of Spar Island, Thunder Bay, Lake Superior.

An association of a coarse crystalline calcite and barite; it contained a few specks of galena. Weight of specimen, twelve and a-half ounces.

It contained neither gold nor silver.

- 25.—This, and the three following, are selected specimens from a vein at the eastern end of Pie Island, Thunder Bay, Lake Superior.

A light greenish-grey colored, highly siliceous rock, carrying a little galena. Weight of specimen, one pound eleven and three-quarter ounces. Assays showed it to contain :—

Gold..... none.
Silver..... 0·175 of an ounce to the ton of 2,000 lbs.

- 26.—A dark-grey shale, associated with a little colorless crystalline quartz, carrying a small quantity of zinc-blende and a trifling amount of galena. Weight of specimen, nine ounces.

It contained neither gold nor silver.

- 27.—Iron-pyrites associated with a little dark-grey shale. Weight of specimen, four and a-quarter ounces.

It contained neither gold nor silver.

- 28.—A dark, slightly greenish-grey shale, carrying a trifling amount of galena. Weight of specimen, eight and a-quarter ounces.

It contained neither gold nor silver.

- 29.—From a vein about half a mile south-east of that from which the four preceding specimens were taken.

A dark-grey shale, associated with a little quartz, carrying a little galena and a very trifling amount of zinc-blende. Weight of specimen, three and a-quarter ounces. It contained :—

Gold..... none.
Silver..... 0·467 of an ounce to the ton of 2,000 lbs.

30.—From a vein on the south shore of Pie Island, Thunder Bay, Lake Superior, Gold and Silver Assays, cont.

An association of calcite and quartz, carrying a little galena Province of Ontario, cont. and a very trifling amount of iron-pyrites. Weight of specimen, five and a-quarter ounces.

It contained neither gold nor silver.

31.—From a vein on the south shore of Thompson's Island, Thunder Bay, Lake Superior.

Iron-pyrites associated with a small quantity of coarse crystalline calcite. Weight of specimen, four ounces.

It contained neither gold nor silver.

32.—This, and the three following, are selected specimens from a vein on McKellar's Island, Thunder Bay, Lake Superior.

An association of barite and calcite, through which was disseminated a little iron-pyrites and a few specks of galena and zinc-blende. Weight of specimen, fifteen and a-quarter ounces. It was found to contain :—

Gold none.

Silver 0·233 of an ounce to the ton of 2,000 lbs.

33.—Barite, through which was disseminated a few specks of iron-pyrites and zinc-blende, with, here and there, a little hydrated peroxide of iron. Weight of specimen, thirteen and a-quarter ounces. Assays gave :—

Gold none.

Silver 0·233 of an ounce to the ton of 2,000 lbs.

34.—An association of quartz and calcite, with, here and there, a few specks of zinc-blende and galena. Weight of specimen, nine and a-half ounces.

It contained neither gold nor silver.

35.—Barite, with which was associated a trifling amount of iron-pyrites. Weight of specimen, seven ounces. Assays showed it to contain :—

Gold none.

Silver 0·058 of an ounce to the ton of 2,000 lbs.

36.—From a vein near Little Gull Lake. A selected specimen.

A coarse crystalline calcite associated with a little quartz and dark-green chlorite; it contained a trifling amount of zinc-blende

Gold and Silver
Assays, cont.Province of
Ontario, cont.

and iron-pyrites. Weight of specimen, ten and a-half ounces. It was found to contain:—

Gold none.
Silver 0·058 of an ounce to the ton of 2,000 lbs.

37.—From the same vein as the last. Taken from bottom of shaft.

A coarse crystalline calcite in association with a small quantity of quartz and fluorite, with, here and there, a little zinc-blende and a few specks of galena. Weight of specimen, one pound.

It contained neither gold nor silver.

38.—From a vein near to, running parallel with, and north of that from which the two preceding specimens were taken. A selected specimen.

An association of a dark-grey shale and amethystine quartz, carrying a little iron-pyrites. Weight of specimen, seven and a-quarter ounces.

It contained neither gold nor silver.

39.—From a vein near Whitefish River, north of Whitefish Lake.

Calcite, through which was disseminated a little zinc-blende. Weight of specimen, six ounces.

It contained neither gold nor silver.

40.—From a vein on location 96 T., Rabbit Mountain district.

Calcite, with which was associated a little fluorite, also small quantities of zinc-blende, galena, iron-pyrites, copper-pyrites, copper-glance and bornite, with, here and there, a little green carbonate of copper and hydrated peroxide of iron. Weight of specimen, one pound one ounce. It contained:—

Gold trace.
Silver 0·175 of an ounce to the ton of 2,000 lbs.

41.—From a vein on location R. 95, Silver Mountain district.

Barite associated with a little quartz and fluorite. It contained, here and there, a trifling amount of zinc-blende and a few specks of silver-glance and native silver. Weight of specimen, one pound. It was found to contain:—

Gold..... none.
Silver..... 14·292 ounces to the ton of 2,000 lbs.

42.—From a vein on location R. 70, Silver Mountain district.

An association of calcite, quartz and fluorite; it contained a few

specks of iron-pyrites, and was, in parts, coated with hydrated peroxide of iron. Weight of specimen, one pound two and a-half ounces. Assays gave:—

Gold and Silver
Assays, cont.
Province of
Ontario, cont.

Gold distinct traces.

Silver 0.525 of an ounce to the ton of 2,000 lbs.

43.—From a vein on Whitefish River, location R. 135. A selected specimen.

An association of calcite, quartz and fluorite, carrying small quantities of zinc-blende, galena, and iron-pyrites. Weight of specimen, one pound.

It contained neither gold nor silver.

44.—From a vein on location R. 79, Silver Mountain district. A selected specimen.

Quartz, associated with a small quantity of a dark-grey shale; it contained a little galena, and was in parts slightly stained with hydrated peroxide of iron. Weight of specimen, five and a-half ounces.

It contained neither gold nor silver.

45.—From a vein on location R. 115, Silver Mountain district. A selected specimen from north vein.

An association of calcite, fluorite, and quartz, through which was disseminated a small quantity of zinc-blende. Weight of specimen, six and three-quarter ounces.

It contained neither gold nor silver.

46.—From a vein south of that last mentioned. A selected specimen.

A greyish-white quartz, in parts coated with hydrated peroxide of iron. Weight of specimen, thirteen and three-quarter ounces.

It contained neither gold nor silver.

47.—From a vein on location R. 111, Silver Mountain district. A selected specimen.

A greyish-white to white crystalline, translucent quartz, with a little iron-pyrites and galena. Weight of specimen, six and three-quarter ounces.

It contained neither gold nor silver.

48.—From a vein on location R. 57, Silver Mountain district. Sample from main branch in shaft, at a depth of about eighteen feet.

An association of barite, coarse crystalline calcite, fluorite, and

Gold and Silver
Assays, cont.
Province of
Ontario, cont.

a dark-grey shale, carrying a little iron-pyrites and zinc-blende, also some silver-glance and native silver. Weight of specimen, one pound ten ounces. Assays showed it to contain:—

Gold..... none.
Silver..... 127·342 ounces to the ton of 2,000 lbs.

- 49.—From the same vein as that whence last mentioned specimen was taken. From side branches, south side of shaft, at a depth of about eighteen feet.

An association of quartz, calcite, barite, and fluorite, with a little iron-pyrites and zinc-blende, and a few specks of galena. Weight of specimen, thirteen ounces. It was found to contain:—

Gold trace.
Silver 0·758 of an ounce to the ton of 2,000 lbs.

- 50.—From a vein on location R. 98, Silver Mountain district.

An association of quartz, calcite, fluorite, and a dark-grey shale, with, here and there, a few specks of galena. Weight of specimen, one pound two and a-half ounces.

It contained neither gold nor silver.

- 51.—From the so-called "Silver Fall's Mine," Silver Mountain district. Examined for Mr. A. Peroncelle.

The sample, which was stated to consist of material taken from various parts of the working, weighed ten pounds six ounces.

It contained neither gold nor silver.

- 52.—From Slate River, south of Rabbit Mountain. Examined for Mr. Watts.

A coarsely crystalline galena in a highly siliceous gangue; it was in parts coated with a little hydrated peroxide of iron. Weight of specimen, half an ounce.

It contained neither gold nor silver.

- 53.—From Sturgeon River (branch of), due north of the township of Badgerow, District of Nipissing.

It consisted of an association of a somewhat fine crystalline galena and copper-pyrites, with a white translucent quartz. The metallic sulphides constituted, approximately, ninety-three per cent., by weight, of the whole. Weight of specimen, six and three-quarter ounces. Assays showed it to contain:—

Gold..... very distinct traces.
Silver..... 15·750 ounces to the ton of 2,000 lbs.

54.—From the fifteenth lot of the ninth range of Bagot, county of Renfrew. Examined for Mr. C. F. Gildersleeve. Gold and Silver Assays, cont.

Iron-pyrites in a gangue consisting of white and red calcite, quartz, and mica. Weight of specimen, eight and three-quarter ounces. Province of Ontario, cont.

It contained neither gold nor silver.

55.—From an opening about ten miles from Port Arthur, Thunder Bay, Lake Superior. Examined for T. S. Sproule, Esq., M.P.

It consisted of galena, associated with a little iron-pyrites, in a gangue of quartz. Weight of specimen, three ounces. It was found to contain:—

Gold none.

Silver 1.458 ounces to the ton of 2,000 lbs.

DISTRICT OF KEEWATIN.

56.—From bay south of Cape Jones, north-west side of Hudson's Bay, nearly opposite Marble Island. Collected by Dr. R. Bell. District of Keewatin.

Massive, very fine crystalline iron-pyrites, through which was disseminated a light-greyish colored quartz. The latter constituted, approximately, twenty per cent., by weight, of the whole. Weight of specimen, six and a-half pounds. It contained:—

Gold trace.

Silver 0.175 of an ounce to the ton of 2,000 lbs.

This specimen was also examined for copper—the results were negative.

57.—This and the following specimen is from the Minerva location, Minerva Island. The latter lies about nine miles south-west of Rat Portage, Lake of the Woods. They were examined for Mr. G. Denison Taylor.

This specimen was stated to have been taken from near the surface, and to constitute a continuous streak of from one to two inches in width near the northern wall.

A white translucent quartz, in association with a small quantity of a greenish-grey chloritic mineral; the whole was more or less stained with hydrated peroxide of iron; it contained a little iron-pyrites, a few specks of galena, and an occasional speck of gold. Weight of specimen, one and three-quarters ounces. Assays gave:—

Gold..... 7.696 ounces to the ton of 2,000 lbs.

Silver..... 0.671 of an ounce “ “

Gold and Silver Assays, cont.

District of Keewatin, cont.

58.—The material constituting this sample consisted of specimens taken from :

- a.—The shaft, at a depth of eight feet: consisting of a greyish-white translucent quartz, in association with a somewhat dark, greenish-grey chloritic rock, through which was disseminated a small quantity of iron-pyrites. Weight of specimen, two and a-half pounds.
- b.—Shaft, hanging wall: an association of a greyish-white quartz and a dark, slightly greenish-grey chloritic rock, containing a small quantity of iron-pyrites. Weight of specimen, one pound two ounces.
- c.—The shaft, at a depth of fifteen feet. This consisted of a greyish-white translucent quartz in association with a small quantity of a bright green chloritic mineral, and a trifling amount of calcite. It contained, in parts, a little iron-pyrites. Weight of specimen, one pound one ounce.

The whole was reduced to powder and intimately mixed, in order to obtain a fair average sample. It contained:—

Gold.....	0·145	of an ounce to the ton of 2,000 lbs.
Silver.....	0·017	“ “ “ “

59.—This, and the following specimen is from the Gold Hill Mine, Gold Lake, Big Stone Bay mining district, Lake of the Woods. They were collected by Mr. A. C. Lawson.

From Shaft No. 1.—A greyish-white to white, very fine crystalline quartzite, traversed by a few thin seams of a dark-green chloritic mineral. Weight of specimen, one pound ten ounces. It was found to contain:—

Gold.....	none.
Silver.....	0·117 of an ounce to the ton of 2,000 lbs.

60.—From Combination lead.—A white translucent quartz in association with a dark-green chloritic schist. Weight of specimen, four ounces. Assays gave:—

Gold.....	distinct traces.
Silver.....	0·233 of an ounce to the ton of 2,000 lbs.

61.—From the west side of Hudson's Bay, south of Chesterfield Inlet. Collected by Dr. R. Bell.

Iron-pyrites. Weight of specimen, eight ounces. Assays showed it to contain:—

Gold.....	trace.
Silver.....	0·233 of an ounce to the ton of 2,000 lbs.

NORTH-WEST TERRITORY.

- 62.—From township 26, range 15, west of 5th principal meridian—
 about ten miles south-west of Silver City. This and the two following specimens were examined for Mr. G. L. Lecomte.

Gold and Silver
 Assays, cont.
 North-West
 Territory.

A milky-white quartz, containing cavities and fissures lined with hydrated peroxide of iron. Weight of specimen, one pound six ounces.

It contained neither gold nor silver.

- 63.—From the same locality as the preceding.

A greyish-white to white sub-translucent quartz. It was very much fissured, and contained numerous cavities; these were, in both instances, lined with hydrated peroxide of iron. Weight of specimen, two and three-quarter pounds.

It contained neither gold nor silver.

- 64.—From the south slope of the second mountain east of what is known as "Castle" Mountain, Rocky Mountains.

A fine to coarse crystalline calcite, containing a good deal of intermixed hydrated peroxide of iron, and a very appreciable amount of green carbonate of copper. Weight of specimen, one pound two and a-half ounces. Assays showed it to contain:—

Gold trace.
 Silver 0.700 of an ounce to the ton of 2,000 lbs.

- 65.—From a small island at the outlet of Burntwood Lake. Collected by Mr. A. S. Cochrane.

A white translucent quartz in association with a dark-grey shale; it contained, in parts, a little iron pyrites. Weight of specimen, five and a-quarter ounces. Assays gave:—

Gold trace.
 Silver none.

- 66.—From the James Haney claim on Discovery Creek, north side, North Saskatchewan River, about sixty miles above Edmonton (section 35, township 50, range 4, west of 5th principal meridian), District of Alberta.

The sample consisted of a light, earthy, friable material, varying in color from pale yellowish to light reddish-brown, and a very fine-grained, hard, apparently baked, arenaceous clay shale of a pale dull yellow to light reddish-brown color. Agreeably with the results of an assay conducted by Mr. E. B. Kenrick,

It contained neither gold nor silver.

Gold and Silver
Assays, cont.North-West
Territory, cont.

67.—The last mentioned was accompanied by another sample, consisting of a dark-colored scoriaceous mass, stated by the sender to consist of material similar to that just described, after it had been submitted to a smelting process, This was also assayed by Mr. E. B. Kenrick.

It contained neither gold nor silver.

In the course of a geological examination of the District of Alberta, during the past summer, Mr. J. B. Tyrrell visited the site of Mr. James Haney's claim, referred to in the last assay but one, and collected good representative specimens of the material, which, on his return, were placed in my hands for examination, and it is to these specimens that the following six assays have reference. Mr. Tyrrell informs me that what is known as Haney's first claim is in a mass of débris fallen from the burnt bed of lignite, while his second claim is in the burned out seam of lignite itself—the two claims being about a mile apart; further, that at about two miles from the site of these claims, and where the seam of lignite remains intact, the same has a thickness of twenty-six feet ten inches, including one foot ten inches of shaly partings.

A good deal of information in regard to the combustion of lignite beds will be found in Dr. G. M. Dawson's Report on the Geology and Resources of the Forty-ninth Parallel, p. 164.

68.—Ashes resulting from the combustion of the seam of lignite. Haney's second claim.

A more or less compacted, but friable, material, varying in color from pale yellowish to light reddish-brown. It was found to contain:—

Gold	trace.
Silver	none.

69.—Shale overlying the seam of lignite. Haney's second claim.

An arenaceous clay-shale, very fine-grained and of close texture; color, pale dull yellow to light, and occasionally dark reddish-brown. It bore evidences of having been submitted to a more or less intense heat. Assays gave:—

Gold	trace.
Silver	none.

70.—Material resulting from the combustion of the seam of lignite. Haney's first claim.

A clinkered mass, in parts scoriaceous, enclosing fragments of

burnt shale; the cementing material, which varied in color from bluish-ash to ash-grey and brownish-red, had a more or less vesicular structure; portions of the mass presented, externally, the appearance of a glassy slag. It contained:—

Gold trace.
 Silver none.

Gold and Silver Assays, cont.
 North-West Territory, cont.

71.—Material found lying on the surface of the ground at the foot of the slope in which the seam of lignite is exposed.

A clinkered semi-scoriaceous material; color, externally, for the most part, greyish-black with a slight brownish tinge; that of freshly fractured surface, ash-grey and brownish-red. Assays showed it to contain:—

Gold trace.
 Silver none.

72.—Boulder clay overlying Laramie sandstones, clays and lignite. From mouth of creek on which Haney's first claim is situated.

It contained neither gold nor silver.

73.—Shaly parting occurring, about eight feet from the top, in seam of lignite. Near Haney's first claim.

This material, which had a clove-brown to blackish-brown color, was also found to contain:—

Gold traces.
 Silver none.

PROVINCE OF BRITISH COLUMBIA.

74.—This, and the two following specimens are from fifteen miles west of summit of Selkirk Range, and three miles north of the line of the Canadian Pacific Railway.

Province of British Columbia.

A coarsely crystalline galena, in association with a trifling amount of calcite. Weight of specimen, nine ounces. Assays showed it to contain:—

Gold..... traces.
 Silver..... 74.521 ounces to the ton of 2,000 lbs.

75.—A white translucent quartz, in parts stained with hydrated peroxide of iron, carrying galena and a small quantity of zinc-blende. The metallic sulphides constituted, approximately, thirty-seven per cent., by weight, of the whole. Weight of specimen, eight and a-half ounces. Assays gave:—

Gold..... none.
 Silver..... 142.187 ounces to the ton of 2,000 lbs.

Gold and Silver
Assays, cont.
Province of
British
Columbia, cont.

- 76.—A coarsely crystalline galena, almost entirely free from gangue. Weight of specimen, two and a-half ounces. It was found to contain:—

Gold..... none.
Silver..... 66·354 ounces to the ton of 2,000 lbs.

- 77.—From about ten miles west of summit of Selkirk Range, and within one and a-half mile of the line of the Canadian Pacific Railway. Examined for Mr. W. A. Allan.

A coarsely crystalline galena in association with a little calcite and quartz. Weight of specimen, one pound nine ounces. It contained:—

Gold..... . minute trace.
Silver..... 74·375 ounces to the ton of 2,000 lbs.

- 78.—This, and the three following specimens are from the Zerran mine, Scotch Creek, Shuswap Lake. The first three were examined for Mr. A. J. Hill, the fourth for Mr. B. Bailey.

Taken from the outcrop.—A moderately coarse crystalline galena, through which was disseminated a few particles of copper-pyrites, in association with small quantities of white translucent quartz and calcite. The metallic sulphides constituted, approximately, ninety per cent., by weight, of the whole. Weight of specimen, three ounces. Assays gave:—

Gold..... distinct traces.
Silver..... 11·667 ounces to the ton of 2,000 lbs.

- 79.—Taken ten feet in from mouth of tunnel.—A moderately fine crystalline galena, in a gangue of white translucent quartz. The galena constituted, approximately, forty-five per cent., by weight, of the whole. Weight of specimen, nearly two ounces. It was found to contain:—

Gold..... distinct traces.
Silver..... 35·000 ounces to the ton of 2,000 lbs.

- 80.—Taken forty-eight feet in from mouth of tunnel.—A moderately coarse crystalline galena, in association with a white translucent quartz. The galena constituted, approximately, eighty per cent., by weight, of the whole. Weight of specimen, seven and a-half ounces. Assays showed it to contain:—

Gold..... distinct traces.
Silver..... 46·667 ounces to the ton of 2,000 lbs.

- 81.—Taken fifty-two feet in from mouth of tunnel.—A moderately fine crystalline galena, through which was disseminated a trifling amount of iron-pyrites, in association with a white translucent quartz. The metallic sulphides constituted, approximately, seventy-two per cent., by weight, of the whole. Weight of specimen, nine and a-half ounces. Assays gave:—

Gold..... distinct traces.
Silver..... 10·208 ounces to the ton of 2,000 lbs.

- 82.—This, and the following specimen are from Nicola Valley. They were examined for Mr. J. Crawford.

It consisted of an association of tetrahedrite, galena, iron-pyrites and zinc-blende, in a gangue of quartz. Weight of specimen, two and a-half ounces. It was found to contain:—

Gold..... 0·729 of an ounce to the ton of 2,000 lbs.
Silver..... 39·521 ounces “ “

- 83.—A fine crystalline galena in association with a little iron-pyrites, in a gangue of quartz. Weight of specimen, two and three-quarter ounces. Assays gave:—

Gold..... distinct traces.
Silver..... 20·927 ounces to the ton of 2,000 lbs.

- 84.—This, and the three following specimens are from the Selkirk Range, and within fifteen or twenty miles of Golden City, on the line of the Canadian Pacific Railway. They were examined for Mr. F. N. Gisborne.

A white translucent quartz, more or less coated with hydrated peroxide of iron. Weight of specimen, three and a-quarter ounces.

It contained neither gold nor silver.

- 85.—A white translucent quartz in association with a small quantity of a dark-grey hydrous mica. It was for the most part thickly coated with hydrated peroxide of iron. Weight of specimen, four and three-quarter ounces. Assays showed it to contain:—

Gold none.
Silver 0·974 of an ounce to the ton of 2,000 lbs.

- 86.—The sample was made up of fragments of a white quartz and a dark grey limestone; the former were much honeycombed, the cavities holding hydrated peroxide of iron. Weight of specimen, two ounces.

It contained neither gold nor silver.

Gold and Silver
Assays, cont.Province of
British
Columbia, cont.

- 87.—A highly calcareous, and very ferruginous, readily friable sandstone, enclosing sharp angular fragments of a light grey, highly ferruginous limestone. Weight of specimen, eight ounces.

It contained neither gold nor silver.

- 88.—This, and the two following specimens are from exposures in the vicinity of the Big Bend, Columbia River. They were examined for Mr. R. A. McVitty.

A white translucent quartz, for the most part thickly coated with hydrated peroxide of iron. Weight of specimen, one and a-half ounces.

It contained neither gold nor silver.

- 89.—A moderately coarse crystalline galena, in a gangue of white translucent quartz; the latter was more or less stained with hydrated peroxide of iron. Weight of specimen, three and a-half ounces. Assays showed it to contain:—

Gold very distinct traces.

Silver..... 43·750 ounces to the ton of 2,000 lbs.

- 90.—A white translucent quartz, in parts thickly coated with hydrated peroxide of iron. Weight of specimen, three and a-quarter ounces.

It contained neither gold nor silver.

- 91.—From the "Moberly lead," ten miles west of summit of Selkirk Range, and ten miles from the line of the Canadian Pacific Railway.

Galena, associated with a small quantity of zinc-blende and a little iron-pyrites, in a gangue of white translucent, occasionally transparent, quartz. The gangue amounted to 59·5 per cent., by weight, of the whole. Weight of specimen, eight and three-quarter ounces. It was found to contain:—

Gold..... distinct traces.

Silver..... 2·917 ounces to the ton of 2,000 lbs.

- 92.—From the "Silver King Mine," McCulloch Creek, Big Bend, Columbia River.

Galena, associated with a small amount of specular iron, in a gangue of white translucent quartz; the latter contained numerous cavities holding hydrated peroxide of iron, and was also, in parts, stained with this latter. The gangue amounted to 88·5 per cent., by weight, of the whole. Weight of specimen, four and a-half ounces. Assays showed it to contain:—

Gold..... distinct traces.

Silver..... 21·875 ounces to the ton of 2,000 lbs.

93.—Said to have been collected at a point five miles east of Laporte, Columbia River. Vein twenty-seven feet wide. Gold and Silver Assays, cont.

A white sub-translucent quartz, thickly coated with hydrated peroxide of iron; a certain proportion of the latter, in a loose pulverulent form, also accompanied the specimen. Specks of metallic gold were readily discernible in the loose material. Weight of specimen, four ounces. It contained:— Province of British Columbia, cont.

Gold.....	40·542 ounces to the ton of 2,000 lbs.
Silver.....	0·700 of an ounce “ “

94.—From Hixon Creek, Upper Fraser River, Cariboo District. Taken from a depth of one hundred feet. Examined for J. Reid, Esq., M.P.

It consisted of a white sub-translucent quartz, carrying copper-glance, a small quantity of copper-pyrites, a little galena, and trifling amounts of bornite and iron-pyrites. It was in parts stained with hydrated peroxide of iron, as also, here and there, with a little green carbonate of copper. Weight of specimen, three and a-quarter pounds. Assays showed it to contain:—

Gold.....	0·583 of an ounce to the ton of 2,000 lbs.
Silver.....	29·983 ounce “ “ “

95.—The foregoing was accompanied by a small quantity—0·2332 gram—of material, which was stated to be the concentrates of half a pound of the rock. In this native gold was readily discernible. It contained:—

Gold	2·659 per cent.
Silver	4·181 “

96.—Subsequently another sample of concentrates of the ore from Hixon Creek (Assay No. 94) was received for examination; it weighed five and three-quarter ounces. Assays showed it to contain:—

Gold, equal to	8·021 ounces to the ton of 2,000 lbs.
Silver, “	18·229 “ “ “

of concentrates. It was not stated how many tons of ore a ton of such concentrates would represent.

97.—From the property of the Nicola Milling and Mining Company—south-east side of Stump Lake, Nicola Valley. Examined for Mr. A. E. Howse.

It consisted of galena in association with tetrahedrite, small quantities of iron-pyrites, copper-pyrites, and a little bornite, in a

Gold and Silver
Assays, cont.Province of
British
Columbia, cont.

gangue of quartz, the latter frequently very much honeycombed. The whole presented a more or less weathered appearance, and was for the most part coated with hydrated peroxide of iron, in parts with carbonate of lead, and here and there with a little green carbonate of copper. Weight of specimen, three pounds three and a-half ounces. Assays gave:—

Gold.....	0·729 of an ounce to the ton of 2,000 lbs.			
Silver.....	104·271 ounces	“	“	“

98.—This, and the following specimen, is from the southern extremity of Stump Lake, Nicola Valley. They were examined for Mr. R. Scott.

A fine crystalline galena, associated with a little iron-pyrites, in a gangue of greyish-white translucent quartz. The metallic sulphides constituted, approximately, one-fourth, by weight, of the whole. Weight of specimen, three and a-half ounces. It was found to contain:—

Gold.....	0·729 of an ounce to the ton of 2,000 lbs.			
Silver.....	15·094 ounces	“	“	“

99.—A somewhat coarse crystalline galena, in association with iron-pyrites, copper-pyrites, and a white translucent quartz; the latter constituted but a very small proportion of the whole. Weight of specimen, three and a-quarter ounces. Assays showed it to contain:—

Gold.....	1·969 ounces to the ton of 2,000 lbs.			
Silver.....	17·063	“	“	“

100.—From the Taylor lead, Big Bend, Columbia River. This and the three following specimens were examined for Dr. G. T. Orton.

A milky white quartz carrying a trifling amount of galena and iron-pyrites: it was in parts stained and coated with hydrated peroxide of iron. Weight of specimen, five and a-quarter ounces. It was found to contain:—

Gold.....	0·175 of an ounce to the ton of 2,000 lbs.			
Silver.....	0·641	“	“	“

101.—From the Little Bunting lead, Big Bend, Columbia River. A white translucent quartz, with which was associated a little mica; it was for the most part coated with ferric hydrate. Weight of specimen, two ounces. Assays gave:—

Gold.....	1·925 ounces to the ton of 2,000 lbs.			
Silver.....	0·175 of an ounce	“	“	“

102.—From Otter Tail Creek.

An association of a fibrous, finely crystalline, and a somewhat coarsely crystalline galena, through which was disseminated a few specks of copper-pyrites and a trifling amount of a micaceous mineral which gave all the reactions of Cookeite (see under Miscellaneous minerals, p. 12T); it was in parts coated with carbonate of lead. Weight of specimen, two and a-quarter ounces. It contained:—

Gold..... none.
Silver..... 16·771 ounces to the ton of 2,000 lbs.

Gold and Silver Assays, cont.

Province of British Columbia, cont.

103.—From Otter Tail Creek.

An association of galena and tetrahedrite, together with a little copper-pyrites and quartz; it was, here and there, coated with carbonate of lead, and green and blue carbonate of copper. A small quantity of the micaceous mineral, referred to in describing the preceding specimen, was also observed in this one. Weight of specimen, three-quarters of an ounce. Assays showed it to contain:—

Gold..... none.
Silver..... 113·749 ounces to the ton of 2,000 lbs.

104.—This, and the following specimen, is from the Columbia claim, McCulloch Creek, Big Bend, Columbia River. They were examined for Mr. R. A. McVitty.

From the North lead.—A white translucent quartz, carrying a little galena; some pieces were very much honeycombed, the cavities holding hydrated peroxide of iron; all the fragments were more or less stained with the latter. Weight of specimen, four and three-quarter pounds. It contained:—

Gold..... distinct traces.
Silver..... 16·975 ounces to the ton of 2,000 lbs.

105.—From the South lead.—A white translucent quartz, seamed and stained with hydrated peroxidized of iron; it contained a little iron-pyrites. Weight of specimen, two pounds two ounces. Assays gave:—

Gold..... none.
Silver..... 0·525 of an ounce to the ton of 2,000 lbs.

106.—From thirty-three miles east of Revelstoke (formerly Farwell), near the line of the Canadian Pacific Railway, Selkirk Range. Examined for Mr. A. F. McKinnon.

Gold and Silver
Assays, cont.Province of
British
Columbia, cont.

A fine to moderately coarse crystalline galena, in association with a little calcite. It was found to contain:—

Gold..... none.
Silver..... 53·230 ounces to the ton of 2,000 lbs.

- 107.—From the Maple-leaf claim, Illecillewaet River, about thirty-three miles east of Revelstoke (formerly Farwell), and within a mile of the line of the Canadian Pacific Railway, Selkirk Range. Examined for Mr. J. Boyd.

A coarse crystalline galena, through which was disseminated a trifling amount of gangue, consisting of calcite; it was, in parts, stained with a little green carbonate of copper. Weight of specimen, ten ounces. It contained:—

Gold..... none.
Silver..... 65·625 ounces to the ton of 2,000 lbs.

- 108.—From the Shamrock claim, which is in close proximity to the claim whence the preceding specimen was taken. Examined for Mr. J. Boyd.

Galena, exhibiting a somewhat fibrous structure, in association with a little calcite; the latter constituted but a very small proportion, by weight, of the whole. Weight of specimen, one and a-quarter pound. Assays gave:—

Gold..... none.
Silver..... 78·750 ounces to the ton of 2,000 lbs.

- 109.—This, and the following specimen is from within three miles of Field Station, on the line of the Canadian Pacific Railway, Kicking Horse Pass, Rocky Mountains. They were examined for Mr. G. B. Pattee.

A moderately coarse crystalline galena in a gangue of dolomite. Weight of specimen, four pounds three ounces. The galena, carefully freed from the gangue, was found to contain:—

Gold..... none.
Silver..... 3·646 ounces to the ton of 2,000 lbs.

- 110.—A fine to moderately coarse crystalline galena. It contained but a very trifling amount of gangue. Weight of specimen, two pounds two ounces. Assays showed it to contain:—

Gold..... none.
Silver..... 6·563 ounces to the ton of 2,000 lbs.

- 111.—From Goat River, Kootenay. Received from Mr. J. W. Ridgway.

A fine to moderately coarse crystalline galena in association with a little iron-pyrites, in a gangue of quartz. Weight of specimen, fifteen ounces. It contained:—

Gold and Silver Assays, cont.
Province of British Columbia, cont.

- Gold..... none.
- Silver..... 14·583 ounces to the ton of 2,000 lbs.

112.—From the Steadman ledge, Richfield, Cariboo District. Examined for J. Reid, Esq., M.P.

A white translucent quartz, traversed by thin seams of carbonaceous matter, with, here and there, a few specks of iron-pyrites. It was found to contain:—

- Gold..... distinct trace.
- Silver none.

113.—From the Ebenezer Mine, Kicking Horse Pass, two and a-half miles east of Golden City, Rocky Mountains. Collected by Mr. R. G. McConnell.

A white, fine crystalline-granular limestone, through which was disseminated small quantities of a bright-red colored cinnabar and minute crystals of iron-pyrites. Assays showed it to contain:—

- Gold trace.
- Silver none.

MISCELLANEOUS EXAMINATIONS.

Miscellaneous examinations.

1.—Shell-marl from the Island of Anticosti, Province of Quebec. Examined for Mr. F. W. Stockwell.

Shell-marl from the Island of Anticosti, Province of Quebec.

This material was found by Mr. F. D. Adams to contain—after drying at 100° C., whereby it lost 20·897 per cent. of water—0·008 per cent. of phosphoric acid, which would represent 0·017 per cent. tribasic phosphate of lime. Or—in the condition in which it was received—0·0063 per cent. of phosphoric acid, representing 0·0137 per cent. tribasic phosphate of lime.

2.—A carbonaceous schist from one mile south of Ptarmigan Bay, Lake of the Woods, District of Keewatin. Collected by Mr. A. C. Lawson.

Carbonaceous schist from Ptarmigan Bay, Lake of the Woods, District of Keewatin.

It had a blackish-grey color, was fine-grained, and earthy in texture. Mr. F. D. Adams found it to contain—after drying at 100° C., whereby it lost 0·094 per cent. of moisture—5·773 per cent. of carbonaceous matter.

Cement-stone,
from vicinity
of Calgary,
North-West
Territory.

- 3.—Cement-stone. From Shagganappi Point, about two miles west of Calgary, on the line of the Canadian Pacific Railway, North-West Territory. Geological position—Laramie.

A very fine-grained, bluish-grey limestone from this locality yielded, when calcined, a lime of very marked hydraulic character, setting under water in from four to five minutes, and soon acquiring a considerable degree of solidity.

Saline deposit
from vicinity
of Maple Creek,
North-West
Territory.

- 4.—Saline deposit from the bed of a dried-up lake near Maple Creek, North-West Territory. Collected by Mr. R. G. McConnell.

Mr. McConnell states that the lake, which has an area of about one hundred acres, is annually filled in the spring, and dries up towards autumn; also that the saline deposit exceeds four feet in thickness.

This latter has been examined by Mr. E. B. Kenrick. A small proportion of the same was insoluble in water; this was composed of clay, sand and organic matter, and a little carbonate and sulphate of lime. The balance consisted almost exclusively of sulphate of soda, with a little sulphate of magnesia, and a small quantity of chloride of sodium.