GEOLOGICAL SURVEY OF CANADA

G. M. DAWSON, C.M.G., LL.D., F.R.S., DIRECTOR

REPORT

OF THE

SECTION OF CHEMISTRY AND MINERALOGY

BY

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To

G. M. Dawson, C.M.G., LL.D., F.R.S.,

Director of the Geological Survey of Canada.

Sir,—The report which I herewith beg to lay before you, embraces such portion of the work carried out in the Laboratory of this Survey, as has been deemed of sufficient general interest to merit publication. It contains, as may be seen, among other matter, a reference to several highly interesting and, in some instances valuable minerals, of the occurrence of which, in Canada, we were hitherto not cognizant.

I have the honour to be,

Sir,

Your obedient servant,

G. CHRISTIAN HOFFMANN.

Ottawa, 29th March, 1897.

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REPORT

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MISCELLANEOUS MINERALS.

1. Scheelite.

This is the material referred to in my last report (Rep. Geol. Surv. Can., N. S., vol. vii., p. 14 R, 1894) as having been found, associated with a little arsenopyrite and pyrite, in a quartz-lead intersecting the main auriferous vein, at the Ballou or old American mine, Malaga gold mining district, Queens county, in the province of Nova Scotia.

It is compact, massive, with an uneven fracture, has a light smoke-gray colour, a vitreous lustre, and is sub-translucent. Its specific gravity, at 15·5°C., was found to be 6·002.

Analyses by Mr. R. A. A. Johnston, gave as follows:—

	1.	2.	Mean.
Tungsten trioxide	78·95	79·08	79·01
Calcium monoxide	19·75	19·85	19·80
Carbon dioxide	0·73	0·70	0·71
Insoluble matter	0·10	0·12	0·11
			99·63

Deducting the carbon dioxide as calcium carbonate, as likewise the insoluble matter, and recalculating the remaining constituents for one hundred parts, we obtain, as representing the composition of the mineral—

Tungsten trioxide	80·70
Calcium monoxide	19·30
	100·00

2. Tetradymite.

Of this species—a mineral hitherto not known to occur in Canada—the sulphurous variety has been identified by Mr. R. A. A. Johnston,

as occurring, in conjunction with a little hessite, intermixed with the altaite found some six miles north of Liddel Creek, Kaslo River, in the West Kootenay district of the province of British Columbia, of which mention was made in one of my previous reports (Rep. Geol. Surv. Can., N.S., vol. vi., p. 29 R, 1892-93).

It has a foliated structure; a lead-gray, inclining to steel-gray colour, with occasionally a pale yellow tarnish; a metallic lustre; and affords a black streak. Its specific gravity, at 15·5° C., was found to be, after correction for a little intermixed quartz, 7·184.

Analyses made by Mr. Johnston, upon apparently pure material, afforded the following results:—

	1.	2.	Mean.
Tellurium	35·964	36·064	36·01
Sulphur	4·315	4·280	4·30
Selenium	trace.	trace.	trace.
Bismuth	51·766	51·940	51·85
Lead	3·576	3·420	3·50
Silver	0·939	0·880	0·91
Thallium	trace.	trace.	trace.
Insoluble residue (quartz)	3·496	3·540	3·52
			100·09

From this it will be seen that, notwithstanding that the material was selected with the utmost care, it nevertheless contained small quantities of intermixed quartz and of the associated minerals, altaite and hessite.

Deducting the quartz, and recalculating the remaining constituents for one hundred parts, we obtain:

Tellurium	37·29
Sulphur	4·45
Selenium	trace.
Bismuth	53·69
Lead	3·63
Silver	0·94
Thallium	trace.
	100·00

If from this we subtract the lead and silver together with an amount of tellurium, sufficing to form with these respectively altaite and hessite, the remaining figures afford a ratio closely corresponding to the formula, $2\ Bi_2\ Te_3 . Bi_2\ S_3$.

3. Altaite.

This very rare mineral, which had hitherto been recognized as occurring in but one locality in Canada (Rep. Geol. Surv. Can., N.S.,

vol. vi., p. 29 R, 1892-93), has since been met with by Messrs. H. A. and G. A. Guess, associated with hessite, fine to coarse native gold, thin plates of native copper and, apparently, native tellurium, in a segregated quartz vein carrying chalcopyrite, pyrite, pyrrhotite, and chalcocite, at the Lakeview claim, on the north side of Long Lake, a small sheet of water some thirteen miles north-north-east of the mouth of Boundary Creek, Kettle River, Yale district, in the province of British Columbia. The above named gentlemen very kindly placed a portion of their material at my disposal, with permission to examine it more fully, and the following are the results of the investigation.

The mineral is massive, of a tin-white colour, with here and there, a bronze-yellow tarnish, and has a metallic lustre. Its specific gravity, at 15·5° C., was found to be, after correction for a little intermixed quartz, 8·081.

Analyses made by Mr. R. A. A. Johnston, upon carefully selected material, gave :—

	1.	2.	Mean.
Tellurium	39·664	39·474	39·57
Lead	49·689	49·751	49·72
Silver	2·057	2·131	2·09
Iron	0·599	0·657	0·63
Gold, free	0·010	0·010	0·01
Insoluble residue (quartz)	7·841	7·837	7·84
			99·86

Subtracting the quartz and free gold, and recalculating the remaining constituents for one hundred parts, we obtain :—

Tellurium	43·01
Lead	54·04
Silver	2·27
Iron	0·68
	100·00

This would correspond to 87·46 per cent of altaite, 3·62 per cent of hessite, and an excess of 8·24 per cent of tellurium, which may be present in the native state. Thus showing the material examined to have consisted of altaite with a small proportion of intermixed hessite and, apparently, some native tellurium.

4. Hessite.

This species, not previously recognized as occurring in Canada, has been identified by the Messrs. H. A. and G. A. Guess, as occurring with altaite, fine to coarse native gold, thin plates of native copper and apparently, native tellurium, in a segregated quartz vein carrying

chalcopyrite, pyrite, pyrrhotite, and chalcocite, at the Lakeview claim, on the north side of Long Lake (referred to under 'altaite'), Yale district, in the province of British Columbia; and, associated with native gold, chalcopyrite, pyrite, and galena, in a parallel quartz vein, at the North Star claim, on the south side of this lake. These gentlemen have likewise observed this mineral as occurring, with petzite, native gold, et cetera, in a vein composed of quartz and coarsely crystalline siderite, at the Calumet claim, Kruger Mountain, on the western shore of Osoyoos Lake—also in the district of Yale. An analysis by them, of a specimen of the mineral from the Lakeview claim, gave—Tellurium 37·33, silver 60·68, gold 2·29 = 100·30.

5. Petzite.

The occurrence of this rare mineral in Canada, was for the first time pointed out by the Messrs. H. A. and G. A. Guess, who identified it as occurring with hessite, native gold, et cetera, in a vein, the exact nature and extent of which has not yet been determined, composed of quartz and coarsely crystalline siderite, at the Calumet claim, Kruger Mountain, on the western shore of Osoyoos Lake, Yale district, in the province of British Columbia; and, at a point some forty miles east by north of this, in the same district, they also recognized it as occurring, in association with free gold, galena, and pyrite, in a quartz vein at the Enterprise claim, on the south side of Long Lake—a locality referred to under 'altaite.' Their analysis of a specimen of the mineral from the Calumet claim, Kruger Mountain, showed it to contain 23·10 per cent of gold; and that of a specimen from the Enterprise claim, Long Lake, afforded them 18·79 per cent of gold.

6. Stromeyerite.

Among other specimens brought by Mr. R. G. McConnell on his return from his last season's geological investigations in the West Kootenay district of the province of British Columbia, was one which has been identified by Mr. R. A. A. Johnston as being the species stromeyerite—a mineral not previously recognized as occurring in Canada. It was found at the Silver King mine, on Toad Mountain, in the above mentioned district, where it occurs associated with bornite, chalcopyrite, pyrite, tetrahedrite, galena, sphalerite, and argentite, distributed through a gangue composed of a grayish felspathic rock with a little quartz and calcite, in a replacement vein traversing the schistose eruptive rocks of the district.

The mineral is massive, compact; has a dark steel-gray colour, a metallic lustre, breaks with a sub-conchoidal fracture, and affords a

dark-gray shining streak. Mr. Johnston found it to have a specific gravity, at 15·5°C., of 6·277, and, conformably with the results of his analyses—conducted upon carefully selected material—the undermentioned composition :—

	1.	2.	Mean.
Sulphur	15·775	15·714	15·74
Silver	52·236	52·307	52·27
Copper	31·530	31·668	31·60
Iron	0·180	0·170	0·17
			99·78

7. Danaite.

A specimen, of what on analysis proves to be this mineral, was obtained by Mr. R. G. McConnell at the Evening Star mine, on the east slope of Monte Cristo Mountain, Trail Creek, in the West Kootenay district of the province of British Columbia, where it occurs accompanying pyrrhotite, ordinary mispickel, and pyrite.

The material consists of arsenopyrite distributed through a gangue composed of fine to coarse-crystalline calcite with a little intermixed quartz, which is, in parts, coated with ferric hydrate and the earthy peach-blossom red variety of erythrite. The metalliferous portion constituting, approximately, forty-five per cent, by weight, of the whole.

The mineral, which sometimes exhibits an indistinct crystalline structure, is of a silver-white colour, brittle, breaks with an uneven fracture, and affords a grayish-black streak. Its specific gravity, at 15·5°C., was found by Mr. R. A. A. Johnston to be, after correction for a little intermixed quartz, 6·166. Analyses by him, conducted upon carefully prepared material, gave as follows :—

	1.	2.	Mean.
Arsenic	46·475	46·347	46·41
Sulphur	19·174	19·256	19·21
Iron	28·831	28·989	28·91
Cobalt	3·009	2·937	2·97
Insoluble residue (quartz)	3·888	3·827	3·86
			101·36

Deducting the insoluble matter, and recalculating the remaining constituents for one hundred parts, we obtain, as representing the composition of the mineral—

Arsenic	47·60
Sulphur	19·70
Iron	29·65
Cobalt	3·05
	100·00

This mineral had not previously been met with in Canada, at other than the locality mentioned in one of my previous reports—Ann. Rep. Geol. Surv. Can., N.S., vol. v., p. 19 R, 1890-91.

MINERALOGICAL NOTES.

1.—Allanite. Very good specimens of a massive, pitch-black allanite, with strong resino-vitreous lustre, have been received, which were obtained in the township of Hagarty, Renfrew county, province of Ontario, where it apparently occurs in some quantity.

2.—Bismite. This species, not hitherto identified as occurring in Canada, has been recognized by Mr. R. A. A. Johnston as constituting a light grayish-white, earthy incrustation on some specimens of bismuthinite from the township of Lyndoch, Renfrew county, in the province of Ontario.

3.—Bismuthinite. Fine examples of this mineral, in the form of lead-gray lamellar masses, have been met with, accompanying beryl, in a coarse granite vein in the township of Lyndoch, Renfrew county, in the province of Ontario.

4.—Kaolin. White, or all but white, friable masses of kaolin, containing a somewhat large amount of intermixed coarse colourless quartz sand, has been met with on the fifth lot of the sixth range of the township of Amherst, Ottawa county, in the province of Quebec.

5.—Molybdenite. Has been found in some abundance, in the form of foliated masses, which are sometimes of large dimensions, and occasionally more or less thickly coated with molybdite or molybdic ochre, in the township of Egan, Pontiac county, in the province of Quebec; and Mr. J. McEvoy has obtained some very fine specimens of this mineral at a point three miles south-west of Grande Prairie, Yale district, province of British Columbia, where it occurs, accompanying chalcopyrite, in a gangue composed of a massive clove-brown to reddish-brown andradite with a light greenish fine-granular pyroxene.

6.—Smithsonite. A mineral not previously known to occur in Canada, has been recognized by Mr. R. A. A. Johnston, in a sample of ore from the Alamo mine, at the head of Hauser Creek, West Kootenay district, in the province of British Columbia, where it is found accompanying sphalerite, galena, siderite, tetrahedrite and pyrite, also some pyrargyrite, in a gangue composed of crushed and brecciated slate, calcite, and quartz.

LIMESTONES AND DOLOMITES.

Continued from page 35 R of the Annual Report of this Survey (vol. vi.) for 1892-93.

The analyses of the following stones, were all conducted by Mr. F. G. Wait.

1.—Limestone. From a quarry at Green Head, Narrows of the St. John River, parish of Portland, St. John county, province of New Brunswick. Geological position—Laurentian. Received from Mr. E. T. P. Shewen.

A dark bluish-gray, fine-crystalline, massive, limestone, through which was disseminated an occasional speck of iron-pyrites. It was found to have the following composition :—

(After drying at 100°C.—Hygroscopic water = 0·09 per cent.)

Carbonate of lime		95·60
" magnesia		0·44
" iron		0·13
Alumina	0·11	4·27
Silica, soluble	0·16	
Insoluble mineral matter	3·54	
Organic matter	0·46	
		100·44

This stone is chiefly, if not exclusively, used for the manufacture of lime.

2.—Limestone. From Stetson's quarry, Indiantown, St. John City, St. John county, province of New Brunswick. Geological position —Laurentian. Received from Mr. E. T. P. Shewen.

A light and dark bluish-gray, banded, somewhat coarse-crystalline, massive, limestone. Its analysis afforded the following results :—

(After drying at 100° C.—Hygroscopic water = 0·04 per cent.)

Carbonate of lime		99·05
" magnesia		0·88
" iron		0·05
Alumina	0·01	0·26
Silica, soluble	0·09	
Insoluble mineral matter	0·14	
Organic matter	0·02	
		100·24

This stone is chiefly, if not exclusively, used for the manufacture of lime.

3.—Limestone. From a quarry on Lawlor's Lake, parish of Portland, St. John county, province of New Brunswick. Geological position —Laurentian. Received from Mr. E. T. P. Shewen.

A bluish-gray, somewhat coarse-crystalline, massive, limestone. The results of its analysis are as follows :—

(After drying at 100° C.—Hygroscopic water = 0·05 per cent.)

Carbonate of lime		98·39
" magnesia		0·71
" iron		0·05
Alumina	0·02	1·19
Silica, soluble	0·04	
Insoluble mineral matter	0·82	
Organic matter	0·31	
		100·34

This stone is chiefly, if not exclusively, used for the manufacture of lime.

4.—Dolomite. From Limehouse, township of Esquesing, Halton county, province of Ontario. This stone occurs in a band nine feet thick, in beds varying from three to seven inches. Geological position—Clinton formation, Silurian. Collected by Dr. R. Bell.

A bluish-gray, yellowish-brown weathering, very fine-crystalline, compact dolomite. Its analysis afforded the following results :—

(After drying at 100° C.—Hygroscopic water = 0·27 per cent.)

Carbonate of lime			48·07
" magnesia			39·63
" iron			0·69
Sulphate of lime			0·10
Alumina		0·21	11·60
Silica, soluble		0·37	
Insoluble matter, consisting of—			
Silica	7·60		
Alumina	2·07		
Ferric oxide	0·40		
Lime	0·05	11·02	
Magnesia	0·19		
Potassa	0·53		
Soda	0·18		
			100·09

This stone has been wrought to a considerable extent, and yields a good hydraulic lime. The cement sets slowly and hardens during several weeks, after which it is said to possess great strength.

5.—Dolomite. From the Priest's quarry, on the bank of the river Speed, township of Guelph, Wellington county, province of Ontario. Geological position—Guelph formation, Silurian.

A light cream-yellow, yellowish-brown weathering, very fine-crystalline, compact dolomite. Its composition was found to be as follows:—

(After drying at 100° C.—Hygroscopic water = 0·02 per cent.)

Carbonate of lime		53·97
" magnesia		45·37
" iron		0·16
Sulphate of lime		0·68
Alumina	trace	0·03
Insoluble matter	0·03	
		100·21

6.—Dolomite. From the Wellington quarry, south half of the twenty-ninth lot, of the Gore of the township of Puslinch, Wellington county, province of Ontario. Geological position—Guelph formation, Silurian.

A light-gray, fine-crystalline, massive, dolomite. It was found to have the following composition:—

(After drying at 100° C.—Hygroscopic water = 0·05 per cent.)

Carbonate of lime		54·25
" magnesia		45·17
" iron		0·22
Sulphate of lime		0·34
Alumina	trace	0·08
Insoluble matter	0·08	
		100·06

7.—Dolomite. From a quarry at Christie's Siding, west half of the third lot, of the sixth concession, of the township of Nassagaweya, Halton county, province of Ontario. Geological position—Niagara formation, Silurian.

A light bluish-gray, fine-crystalline, massive, dolomite. Its analysis afforded the following results:—

(After drying at 100° C.—Hygroscopic water = 0·10 per cent.)

Carbonate of lime		54·12
" magnesia		45·45
" iron		0·58
Sulphate of lime		0·17
Alumina	trace	0·30
Insoluble matter	0·30	
		100·62

COALS.

Continued from p. 15 R of the Annual Report of this Survey for 1894.

87.—Coal from the Sheep Creek coal mines, South Fork of Sheep Creek, section 2, township 20, range 3, west of the fifth initial meridian, district of Alberta, North-west Territory. Seam said to average about four feet in thickness. Geological position—Cretaceous. Received from Mr. H. Grüner.

Structure, for the most part, very fine lamellar, with occasional interstratified, more or less disconnected, lenticular layers of dense, pitch-black, highly lustrous coal—compact: in parts, shows traces of slickensides; hard and firm; does not soil the fingers; is, here and there, intersected by thin plates of calcite; colour, black; lustre, on the whole, resinous; fracture, uneven—occasionally more or less conchoidal; colour of powder, blackish-brown; it communicates a very pale brownish-yellow colour to a boiling solution of caustic potash.

A proximate analysis, by fast coking, gave:—

Hygroscopic water	3·08
Volatile combustible matter	39·37
Fixed carbon	54·50
Ash	3·05
	100·00
Coke, per cent	57·55
Ratio of volatile combustible matter to fixed carbon	1 : 1·38

It yields, by fast coking, a firm, compact coke. The gases evolved during coking burnt with a yellow, luminous, smoky flame. The ash has a brownish-yellow colour,—exposed to a bright red heat it does not become agglutinated, at a most intense red heat, it becomes more or less fritted.

Experiments have been made, on a large scale, in the preparation of coke from the above coal, employing a Coppée's coke-oven, and with very encouraging results—the product being of excellent quality. The sample sent for examination, has a steel-gray colour and bright lustre; is hard and dense and, apparently, capable of supporting a considerable pressure without crumbling, and may be regarded as a most useful metallurgical fuel. It was found to contain—moisture 0·17 per cent, ash 10·70 per cent.

IRON ORES.

The analyses of these, were all conducted by Mr. F. G. Wait.

1.—Magnetite. From the sixteenth lot, of the eleventh concession, of the township of Bagot, Renfrew county, province of Ontario.

A fine-granular, massive magnetite, through which was disseminated a little calcite and actinolite. Determinations of the more important constituents gave :

Ferric oxide	61·11 per cent.
Ferrous oxide	27·20 "
Titanium dioxide	none.
Phosphoric acid	none.
Sulphur	0·10 "
Insoluble matter	4·85 "
Metallic iron, total amount of	63·93 "
Phosphorus	none.
Sulphur	0·10 "

2.—Magnetite. From the, at present unsurveyed, township of Airy, district of Nipissing, province of Ontario. Examined for Mr. W. A. Allan.

A compact, massive magnetite. A partial analysis gave as follows :

Ferric oxide	64·81 per cent.
Ferrous oxide	31·57 "
Titanium dioxide	none.
Phosphoric acid	none.
Sulphur	0·27 "
Insoluble matter	1·66 "
Metallic iron, total amount of	69·92 "
Phosphorus	none.
Sulphur	0·27 "

3.—Magnetite. From the Zanesville or Glendower mine, lot six, concession three, of the township of Bedford, Frontenac county, province of Ontario. This, and the following thirty specimens were collected by Mr. E. D. Ingall.

A somewhat coarsely crystalline magnetite, through which was disseminated small quantities of iron-pyrites, pyroxene, calcite and quartz. It contained :

Metallic iron	61·350 per cent.
Phosphorus	0·004 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	11·110 "

4.—Magnetite. Also from the Zanesville or Glendower mine.

The specimen consisted of magnetite in a gangue composed of white calcite and yellowish-green serpentine. Determinations gave:

Metallic iron	44·570 per cent.
Phosphorus	0·006 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	16·250 "

5.—Hematite. From the second lot, of the seventh concession, of the township of Bedford, Frontenac county, province of Ontario.

It consisted of specular iron, with which was associated small quantities of white felspar and yellowish-brown mica. Analysis gave:

Metallic iron	64·970 per cent.
Phosphorus	0·010 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	6·610 "

6.—Magnetite. From the Bygrove mine, lot three, concession one, of the township of South Sherbrooke, Lanark county, province of Ontario.

A massive magnetite, containing, in parts, a little iron-pyrites and small quantities of a calcareous gangue. It was found to contain:

Metallic iron	62·950 per cent.
Phosphorus	0·007 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	6·590 "

7.—Magnetite. From the Fournier mine, lot fourteen, concession one, of the township of South Sherbrooke, Lanark county, province of Ontario.

A coarsely cleavable, massive magnetite, associated with a small amount of gangue composed of white quartz, black pyroxene, and white mica. Determinations gave:

Metallic iron	60·890 per cent.
Phosphorus	0·002
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	10·010 "

8.—Magnetite. From the sixteenth lot, of the seventh concession, of the township of South Sherbrooke, Lanark county, province of Ontario.

Consisted of magnetite, through which was disseminated a small quantity of gangue, composed of quartz and pyroxene. It contained:

Metallic iron	67·640 per cent.
Phosphorus	0·008 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	2·720 "

9.—Magnetite. From the thirteenth lot, of the eighth concession, of the township of South Sherbrooke, Lanark county, province of Ontario.

It consisted of magnetite, containing, in parts, a little white translucent quartz. Analysis gave:

Metallic iron	67·690 per cent.
Phosphorus	0·012 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	3·100 "

10.—Magnetite. From the ninth lot, of the ninth concession, of the township of South Sherbrooke, Lanark county, province of Ontario.

A massive magnetite, with which was associated a little yellowish-brown mica. It was found to contain:

Metallic iron	62·120 per cent.
Phosphorus	0·008 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	10·250 "

11.—Magnetite. From Geo. Farrell's lot, near Christie's Lake, in the township of South Sherbrooke, Lanark county, province of Ontario.

Consisted of a massive magnetite, through which was disseminated a small quantity of gangue composed of pyroxene and calcite. Determinations gave:

Metallic iron	59·810 per cent.
Phosphorus	0·010 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	9·120 "

12.—Magnetite. From the Yankee mine, lot one, concession six, of the township of North Crosby, Leeds county, province of Ontario.

The specimen consisted of magnetite, through which was disseminated very appreciable quantities of iron-pyrites, and a some-

what large amount of gangue composed of a grayish-white felspar. Analysis gave :

Metallic iron	36·710 per cent.
Phosphorus	0·012 "
Sulphur	undet.
Titanium dioxide	trace.
Insoluble matter	41·400 "

13.—Magnetite. From the north half of the twenty-first lot, of the eighth concession of the township of Bagot, Renfrew county, province of Ontario.

An association of crystalline magnetite and iron-pyrites with some intermixed quartzose gangue. It contained :

Metallic iron	49·780 per cent.
Phosphorus	0·050 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	9·320 "

14.—Magnetite. Also from the north half of the twenty-first lot, of the eighth concession of the township of Bagot, Renfrew county, province of Ontario.

A massive magnetite, in parts coated with ferric hydrate. It was found to contain :

Metallic iron	64·430 per cent.
Phosphorus	0·012 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	2·240 "

15.—Magnetite. From the east half of the sixteenth lot, of the ninth concession of the township of Bagot, Renfrew county, province of Ontario.

Magnetite, with which was associated small quantities of pyroxene and mica. Determinations gave :

Metallic iron	58·180 per cent.
Phosphorus	0·004 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	7·310 "

16.—Magnetite. From the twenty-third lot, of the tenth concession of the township of Bagot, Renfrew county, province of Ontario.

A fine-granular magnetite, with, here and there, a little iron-pyrites and small quantities of a quartzose gangue. It contained:

Metallic iron	48·780	per cent.
Phosphorus	0·090	"
Sulphur	undet.	
Titanium dioxide	none.	
Insoluble matter	5·860	"

17.—Magnetite. From the sixteenth lot, of the eleventh concession of the township of Bagot, Renfrew county, province of Ontario.

A fine-granular, massive magnetite, with which was associated small quantities of green pyroxene. Analysis gave:

Metallic iron	62·430	per cent.
Phosphorus	0·020	"
Sulphur	undet.	
Titanium dioxide	none.	
Insoluble matter	4·550	"

18.—Magnetite. From the same locality as the preceding specimen.

A fine-granular magnetite, through which was disseminated a little iron-pyrites and small quantities of greenish-gray pyroxenite and green talcose mineral. It was found to contain:

Metallic iron	51·380	per cent.
Phosphorus	0·004	"
Sulphur	undet.	
Titanium dioxide	none.	
Insoluble matter	7·960	"

19.—Magnetite. From the eighteenth lot, of the eleventh concession of the township of Bagot, Renfrew county, province of Ontario.

A slightly weathered magnetite. Determinations gave:

Metallic iron	66·600	per cent.
Phosphorus	0·008	"
Sulphur	undet.	
Titanium dioxide	none.	
Insoluble matter	2·000	"

20.—Magnetite. From the twenty-second lot, of the eleventh concession of the township of Bagot, Renfrew county, province of Ontario.

A fine-granular magnetite, with which was associated small quantities of calcite, quartz and pyroxene. It contained:

Metallic iron	51·890	per cent.
Phosphorus	0·016	"
Sulphur	undet.	
Titanium dioxide	none.	
Insoluble matter	15·960	"

21.—Hematite. From lot one, of the ninth concession of the township of Palmerston, Frontenac county, province of Ontario.

Consisted of hematite, through which was disseminated a white translucent quartz. It was found to contain :

Metallic iron	51·630 per cent.
Phosphorus	0·106 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	9·060 "

22.—Magnetite. From the third lot, of the ninth concession of the township of Palmerston, Frontenac county, province of Ontario.

The specimen consisted of magnetite associated with some white and pinkish-white calcite and dark green pyroxene. Analysis gave :

Metallic iron	56·680 per cent.
Phosphorus	0·046 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	9·530 "

23.—Magnetite. From the fourth lot, of the ninth concession of the township of Palmerston, Frontenac county, province of Ontario.

A fine-granular magnetite, distributed through a greenish-gray pyroxenite. Determinations gave :

Metallic iron	37·780 per cent.
Phosphorus	0·040 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	43·610 "

24.—Magnetite. From the eight lot, of the tenth concession of the township of Palmerston, Frontenac county, province of Ontario.

Consisted of magnetite, with some intermixed quartz. It contained :

Metallic iron	57·620 per cent.
Phosphorus	0·088 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	13·720 "

25.—Magnetite. From the twenty-seventh and twenty-eighth lots, of the eleventh concession of the township of Palmerston, Frontenac county, province of Ontario.

A fine-granular magnetite, with which was associated a little white calcite. It was found to contain :

Metallic iron	52·390 per cent.
Phosphorus	0·010 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	16·720 "

26.—Hematite. From the second lot, of the fourth concession of the township of Bathurst, Lanark county, province of Ontario.

Consisted of hematite, in association with small quantities of calcite and a few scales of graphite. Determinations gave :

Metallic iron	51·890 per cent.
Phosphorus	0·005 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	21·240 "

27.—Magnetite. From the eleventh lot, of the eighth concession of the township of Bathurst, Lanark county, Province of Ontario.

A massive magnetite, through which was disseminated small quantities of calcite, quartz, pyroxene and brown mica. Analysis gave :

Metallic iron	62·020 per cent.
Phosphorus	trace.
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	6·670 "

28.—Hematite. From the twenty-third lot of the eleventh concession of the township of Bathurst, Lanark county, province of Ontario.

It consisted of specular iron in a gangue composed of quartz and calcite. It contained :

Metallic iron	47·840 per cent.
Phosphorus	0·016 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	22·820 "

29.—Hematite. From the twentieth lot, of the tenth concession of the township of Storrington, Frontenac county, province of Ontario.

An association of specular iron and brown hematite, together with a little white calcite. It was found to contain :

Metallic iron	51·120 per cent.
Phosphorus	0·300 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	19·850 "

30.—Hematite. From the fourth lot, of the ninth concession of the township of Portland, Frontenac county, province of Ontario.

Consisted of specular iron in a quartzose gangue. Determinations gave:

Metallic iron	52·260 per cent.
Phosphorus	0·004 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	24·570 "

31.—Magnetite. From the west half of the fifth lot, of the thirteenth concession of the township of Portland, Frontenac county, province of Ontario.

The specimen consisted of magnetite, through which was distributed a small quantity of quartzose gangue. It contained:

Metallic iron	46·250 per cent.
Phosphorus	undet.
Sulphur	undet.
Titanium dioxide	4·400 "
Insoluble matter	10·350 "

32.—Magnetite. From the west half of the twenty-fifth lot of the fifth concession of the township of Darling, Lanark county, province of Ontario.

A fine-granular magnetite, through which was disseminated a little iron-pyrites, calcite, and green pyroxene. Analysis gave:

Metallic iron	62·420 per cent.
Phosphorus	0·010 "
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	9·110 "

33.—Magnetite. From the fourth lot, of the twelfth concession of the township of Lavant, Lanark county, province of Ontario.

It consisted of magnetite, with which was associated small quantities of a yellowish-green serpentine and white tremolite. It was found to contain:

Metallic iron	60·320 per cent.
Phosphorus	trace.
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	7·970 "

34.—Magnetite. From a vein of some thirty feet in width, at the mouth of Kildella River, Rivers Inlet, district of New Westminster, province of British Columbia. Examined for Mr. H. Saunders.

An iron-black, fine to somewhat coarse-crystalline magnetite, through which was disseminated small quantities of actinolite, garnet and quartz, and, here and there, small aggregations of green apatite. An analysis of a fair average of the sample received, which weighed one pound twelve ounces, gave :

Metallic iron	65·52 per cent.
Phosphorus	0·21 "
Sulphur	0·33 "
Titanium dioxide	none.
Insoluble matter	4·06 "

35.—Magnetite. Described as coming from about a mile west of the Chicoutimi extension of the Quebec and Lake St. John Railway, near Lake Kenogami, province of Quebec. Examined for Mr. J. G. Scott.

It was only examined for titanium dioxide. Of this it contained, approximately, 15 per cent.

36.—Magnetite. From what was described as the John A. Wright lot, parish of Lepreau, Charlotte county, province of New Brunswick. Examined for Mr. C. W. Wetmore.

A massive, fine-granular magnetite, through which was disseminated a little hornblende and quartz. Determinations gave :

Metallic iron	66·71 per cent.
Nickel	trace.
Cobalt	trace.
Phosphorus	undet.
Sulphur	undet.
Titanium dioxide	none.
Insoluble matter	4·36 "

37.—Magnetite. From the same locality as the preceding specimen, and which had been examined for Mr. Wetmore on a previous occasion with special reference to its content of phosphorus and sulphur—contained :

Metallic iron	59·90 per cent.
Phosphorus	none.
Sulphur	0·04 "
Titanium dioxide	none.
Insoluble matter	13·85 "

NICKEL AND COBALT.

Estimation of, in pyrrhotite from the undermentioned localities in the province of British Columbia—Continued from page 21 R of vol. vii., 1894, of the Annual Reports of this Survey

1.—From the Monte Cristo claim, Trail Creek, Columbia River—West Kootenay district.

The material consisted of an association of pyrrhotite with a little copper-pyrites and small quantities of a quartzose gangue. The pyrrhotite, carefully freed from its associations, was found by Mr. Wait to contain:

Nickel	0·13 per cent.
Cobalt	strong trace.

2.—From the Iron Colt claim, Trail Creek, Columbia River—West Kootenay district.

An intimate association of an exceedingly fine-grained pyrrhotite with a little copper-pyrites, through which was disseminated a small quantity of a quartzose gangue. An analysis by Mr. Wait showed it to contain:

Nickel	0·20 per cent.
Cobalt	strong trace.

The gangue constituted 14·50 per cent, by weight, of the whole. The metalliferous portion of the ore contained, therefore, 0·234 per cent of nickel.

3.—From the Bunbury claim, near Lac le Bois—Interior plateau region.

A dark-gray to grayish-white felspathic rock, carrying small quantities of pyrrhotite.

A selected portion of the material was examined by Mr. Wait, and found to contain:

Nickel	0·065 per cent.
Cobalt	trace.

The gangue, in the material employed, constituted 17·83 per cent, by weight, of the whole. The metalliferous portion of the ore contained, therefore, 0·08 per cent of nickel.

4.—From the Humphrey claim, near Lac le Bois—Interior plateau region.

A grayish-white quartzo-felspathic rock, carrying small quantities of pyrrhotite. It was examined by Mr. Wait and found to contain:

Nickel	0·04 per cent.
Cobalt	trace.

The gangue constituted 59·20 per cent, by weight, of the whole. The metalliferous portion of the ore contained, therefore, 0·10 per cent of nickel.

The results of the examination of a cobaltiferous mispickel from the Evening Star mine, on the east slope of Monte Cristo Mountain, Trail Creek, in the West Kootenay district of the province of British Columbia, are given under 'danaite,' on page 13, ante.

GOLD AND SILVER ASSAYS.

These were all conducted by Mr. R. A. A. Johnston.

As explanatory of the numerous instances in which no trace of either gold or silver was found, it may be mentioned that in nearly all these cases the assay was carried out by special request. The conglomerates and conglomeritic rocks, numbered respectively 11, 13, 19, 28, 29, 37, 39, 62, 63, 69, 75, 76 and 121, were selected and subjected to assay for the purpose of ascertaining whether any of them contained gold, like the well known 'blanket' of the Transvaal.

Province of Nova Scotia.

1.—Tailings, consisting of quartz with some mispickel, from the Malaga mine, Queen's county. Collected by Mr. W. H. Prest.

They contained neither gold nor silver.

Tin was also sought for, and found to be absent.

2.—Described as coming from a vein in close proximity to a rich gold-bearing quartz vein at Cow Bay, Halifax county. Examined for Dr. W. H. Weeks.

A weathered schistose rock. The sample, consisting of a single fragment, weighed five ounces.

It contained neither gold nor silver.

Province of New Brunswick.

3.—Described as occurring on the Buchanan place, near Westfield Station, on the line of the Canadian Pacific Railway, in the parish of Westfield, King's county. Examined for Mr. C. D. Jones.

It consisted of an association of a gray quartzo-felspathic rock with a dark-gray gneiss, carrying small quantities of iron-pyrites. Weight of sample, one pound nine ounces.

It contained neither gold nor silver.

4.—From a mine on the flank of Wolf Mountain, parish of Alma, Albert county. Examined for the Hon. Pascal Poirier.

An association of white sub-translucent quartz with a little dark grayish-green chloritic schist, in parts coated with green carbonate of copper, carrying somewhat large quantities of more or less highly tarnished chalcocite. Weight of sample, four pounds ten ounces. It was found to contain:

Gold ..... trace.
Silver..... 2·683 ounces to the ton of 2,000 lbs.

PROVINCE OF QUEBEC.

5.—From the Grand Rapids on the Mouchoulagan River. Collected by Mr. A. P. Low.

A weathered iron-pyrites. It contained:

Gold.. ..... trace.
Silver.... ..... none.

6.—A sample of the so-called black sand from Moisie, Saguenay county. Examined for Mr. S. J. Dawson.

It contained neither gold nor silver.

7.—From the fourteenth lot of the tenth range of the township of Ditton, Compton county. This, and the five following specimens were collected by Mr. R. Chalmers.

An association of white sub-translucent quartz with a little gray chloritic schist, in parts coated with hydrated peroxide of iron, carrying small quantities of iron-pyrites. Weight of sample, three pounds four ounces.

It contained neither gold nor silver.

8.—From the fourteenth lot of the ninth range of the township of Ditton, Compton county.

An association of a white sub-translucent quartz with a little dark gray chloritic schist, in parts coated with hydrated peroxide of iron. Weight of sample, one pound nine ounces.

It contained neither gold nor silver.

9.—From the same locality as the preceding specimen.

A white sub-translucent quartz, in parts coated with hydrated peroxide of iron. Weight of sample, one pound seven ounces.

It contained neither gold nor silver.

10.—From the fortieth lot of the ninth range of the township of Ditton, Compton county.

An association of a white sub-translucent quartz with a little gray chloritic schist, in parts stained and coated with hydrated peroxide of iron. Weight of sample, two pounds fifteen ounces.

It contained neither gold nor silver.

11.—From the Harrison gold mine, lot one of the sixth range of the township of Westbury, Compton county. Geological position—Pre-Cambrian.

An arkose rock, consisting of an intimate association of white quartz, grayish-white felspar and white talc, carrying a little iron-pyrites. The sample, which was, in parts, stained with hydrated peroxide of iron, weighed one pound four ounces. It was found to contain:

Gold..... 0·350 of an ounce to the ton of 2,000 lbs.
Silver..... none.

12.—From the Falls, Bras River, Beauce county.

An association of white sub-translucent quartz with small quantities of a gray felspathic rock, more or less coated with hydrated peroxide of iron, carrying some iron-pyrites. Weight of sample, three pounds ten ounces. It contained:

Gold..... trace.
Silver..... none.

13.—From the east shore of Lake Temiscamingue, lot five of the second range of the township of Guigues, Pontiac county. Geological position—Huronian. Collected by Mr. A. E. Barlow.

A somewhat coarse conglomerate, consisting of a cementation of pebbles of greenstone and red and white quartz, carrying small quantities of iron-pyrites. Weight of sample, three pounds.

It contained neither gold nor silver.

14.—From an island on the coast of Labrador, north-east of Kayaksuatilik, in latitude 55° 24′ north and longitude 59° 58′ west. Examined for the Hon. Robert Bond.

An association of somewhat coarsely crystalline white limestone with gray and white quartz and a little dark gray chloritic schist, carrying small quantities of iron-pyrites and copper-pyrites. The sample, which was in parts stained and coated with hydrated peroxide of iron and blue and green carbonate of copper, weighed fifteen pounds. Submitted to assay, it was found to contain:

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

NORTH-EAST TERRITORY.

15.—From the Red Fall, Waswanipi River. This, and the three following specimens were collected by Dr. R. Bell.

Quartz with a little white mica, carrying somewhat large quantities of iron-pyrites. Weight of sample, seven ounces.

It contained neither gold nor silver.

16.—From Outlet Portage on what is called by the Indians 'big river.

An association of white translucent quartz with a dark gray felspathic rock. Weight of sample, nine ounces.

It contained neither gold nor silver.

17.—From the east side of what is called by the Indians 'big' river, opposite the head of an island eighteen miles above Mataggami Lake.

A grayish-white sub-translucent quartz with, here and there, a few scales of white mica, and specks of iron-pyrites. Weight of sample, seven ounces.

It contained neither gold nor silver.

18.—From the second fall, foot of the Long Stretch, on what is called by the Indians 'big' river.

White translucent quartz, carrying small quantities of copper-pyrites. Weight of sample, three ounces. Assay gave:

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

PROVINCE OF ONTARIO.

19.—From fifteen hundred paces on Happy-at-last Portage, West Bay, west side of Lake Nipissing. Geological position—Huronian. Collected by Dr. R. Bell.

A white and grayish-white brecciated quartz conglomerate. Weight of sample, three ounces.

It contained neither gold nor silver

20.—From mining location 10, east side of Lake Wahnapitae, district of Nipissing. Examined for Mr. M. Morin.

A grayish-white quartzite in association with a dark gray mica-schist. The sample, which was, in parts, coated with hydrated peroxide of iron, weighed two pounds eleven ounces. It contained:

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

21.—From the seventh lot, of the third concession of the township of Street, district of Nipissing. This, and the following specimen were examined for Mr. D. O'Connor.

An association of grayish-white translucent quartz with a little light gray dolomite, carrying small quantities of iron-pyrites. Weight of sample, four pounds thirteen ounces. Assays gave:

Gold..... trace.
Silver..... none.

22.—From the same locality as the preceding specimen.

A rust-coated gray translucent quartz, carrying very small quantities of iron-pyrites. Weight of sample, four pounds twelve ounces.

It contained neither gold nor silver.

23.—From the east side of Lake Wash-ki-gamog, claim No. 255, W. D. 67, township of Davis, district of Nipissing. Examined for Mr. Z. J. Fowler.

An association of white sub-translucent quartz with a very little grayish-white dolomite, in parts coated with hydrated peroxide of iron, carrying small quantities of iron-pyrites. Weight of sample, fifteen ounces. It was found to contain:

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

24.—From the eleventh lot, of the first concession of the township of Blezard, district of Nipissing. Examined for Mr. D. O'Connor.

An association of white translucent quartz with a little yellowish-white calcite, carrying small quantities of iron-pyrites and coarsely crystalline galena. Weight of sample, three pounds eight ounces. It contained:

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

25.—From the fourth lot, of the fifth concession of the township of Snider, district of Algoma. Examined for Mr. W. Levesque.

An association of white sub-translucent quartz with some greenish-black chloritic schist, in parts coated with hydrated peroxide of iron, carrying small quantities of iron-pyrites. Weight of sample, three pounds five ounces.

It contained neither gold nor silver.

26.—From the fourth lot, of the second concession of the township of Saulter, district of Algoma. Examined for Mr. J. B. White.

A bluish-white translucent quartz, in parts coated with hydrated peroxide of iron, carrying very small quantities of iron-pyrites. Weight of sample, three ounces and a half. It was found to contain :

Gold..... trace.
Silver..... 0·350 of an ounce to the ton of 2,000 lbs.

27.—From the Balfour mine, south half of lot six, in the first concession of the township of Balfour, district of Algoma. Examined for Mr. L. A. Morrison.

It consisted of a gneissoid rock, carrying somewhat large quantities of iron-pyrites and zinc-blende. Weight of sample, one pound fifteen ounces. Assays gave :

Gold..... trace.
Silver..... 2·742 ounces to the ton of 2,000 lbs.

28.—From four miles and a half west of Cartier Station, on the main line of the Canadian Pacific Railway, township of Hess, district of Algoma. Geological position—Huronian. This, and the following specimen were collected by Dr. R. Bell.

A white and grayish-white quartz conglomerate. Weight of sample, one pound ten ounces.

It contained neither gold nor silver.

29.—From eight miles east of Cartier Station on the main line of the Canadian Pacific Railway, township of Cartier, district of Algoma. Geological position—Huronian.

An association of grayish-white sub-translucent quartz with a little green chloritic schist, carrying small quantities of pyrrhotite.

It contained neither gold nor silver.

30.—From the ninth lot of the sixth concession of the township of Denison, district of Algoma. Examined for Mr. P. J. Loughrin.

A slightly weathered gray mica-schist, carrying small quantities of iron-pyrites. Weight of sample, fourteen ounces.

It contained neither gold nor silver.

31.—From the south half of the second lot, of the fifth concession of the township of North Sherbrooke, Lanark county. Examined for Mr. Joseph Sergeant.

An association of white translucent quartz with a little black tourmaline, in parts stained and coated with hydrated peroxide of iron, carrying some iron-pyrites. Weight of sample, one pound eleven ounces. It contained :

Gold..... trace.
Silver..... none.

32.—From the fourth lot of the thirteenth concession of the township of Rawdon, Hastings county. Examined for Mr. A. W. Carscallen.

A somewhat fine crystalline galena, together with small quantities of iron-pyrites and zinc-blende, in a gangue composed of white crypto-crystalline quartz and white crystalline calcite. The gangue constituted but a small proportion, by weight, of the whole. Weight of sample, one pound seven ounces. It was found to contain :

Gold..... none.
Silver..... 51·042 ounces to the ton of 2,000 lbs.

33.—From the twenty-sixth lot of the eighth concession of the township of Clarendon, Frontenac county. Examined for Mr. Jno. Critchley.

An association of grayish-white sub-translucent quartz with small quantities of felspar, mica and crystalline calcite, carrying a little iron-pyrites. Weight of sample, one pound ten ounces.

It contained neither gold nor silver.

34.—From the same locality as the preceding specimen. Also examined for Mr. Jno. Critchley.

A white translucent quartz, more or less stained and coated with hydrated peroxide of iron. Weight of sample, one pound thirteen ounces.

It contained neither gold nor silver.

35.—From the thirtieth lot of the third concession of the township of Clarendon, Frontenac county. Examined for Mr. John Dack.

An association of white sub-translucent quartz with a little greenish-gray pyroxene, carrying small quantities of iron-pyrites. Weight of sample, one pound nine ounces.

It contained neither gold nor silver.

36.—From the same locality as the preceding specimen. Also examined for Mr. John Dack.

A white translucent quartz, carrying very small quantities of pyrrhotite and iron-pyrites. The sample, which was in parts coated with hydrated peroxide of iron, weighed one pound six ounces.

It contained neither gold nor silver.

37.—From the B mine, Babcock farm, west half of the fourth lot of the ninth concession of the township of Portland, Frontenac county. Geological position—basal beds of the Potsdam sandstone, Cambrian. Collected by Mr. E. D. Ingall.

A somewhat fine quartz conglomerate. Weight of sample, two pounds fourteen ounces.

It contained neither gold nor silver.

38.—From the twenty-fourth lot of the seventh concession of the township of Cartwright, Durham county. Examined for Mr. John Brown.

A white crypto-crystalline quartz, in parts thickly coated with hydrated peroxide of iron, carrying iron-pyrites. Weight of sample, four ounces.

It contained neither gold nor silver.

39.—From Eagle Point, Lake Huron. Geological position—Huronian. Collected by Mr. T. C. Weston.

A compact, white and reddish-gray quartzite with a few included pebbles of red jasper. Weight of sample, one pound six ounces.

It contained neither gold nor silver.

40.—From lot R. 570, near Pays Plat River, district of Thunder Bay. Examined for Mr. Maynard Rogers.

An association of white sub-translucent quartz with some white calcite, purple and green fluorite, and a little yellow serpentine, carrying small quantities of yellowish to blackish-brown zinc-blende, copper-pyrites, and a very little native silver. It was found to contain:

Gold.....	distinct trace.
Silver.....	57·837 ounces to the ton of 2,000 lbs.

41.—From a property adjoining mining claim 233 T, just outside the township of McIntyre, district of Thunder Bay. Examined for Mr. Thomas McLea.

A banded white and dark gray quartzite, carrying small quantities of iron-pyrites. Weight of sample, an ounce and three-quarters.

It contained neither gold nor silver.

42.—From location 313 and 314 X., east side of Sawbill Lake, district of Rainy River. Examined for Mr. F. S. Wiley.

A white and reddish-white sub-translucent quartz, carrying small quantities of iron-pyrites, copper-pyrites, and a very little zinc-blende. Weight of sample, twelve ounces. Assays gave:

Gold.....	5·425 ounces to the ton of 2,000 lbs.
Silver.....	2·047 " "

43.—From the Indian Joe vein, claim S. 94, the property of the Yum-yum Gold Mining Company, south side of Bag Bay, Shoal Lake, district of Rainy River. This, and the following specimen were examined for Mr. E. Seybold.

A grayish-white quartz, in parts coated with hydrated peroxide of iron, carrying small quantities of iron-pyrites. Weight of sample, one pound one ounce.

It contained neither gold nor silver.

44.—From the so-called No. 2 vein, claim S. 94, the property of the Yum-yum Gold Mining Company, south side of Bag Bay, Shoal Lake, district of Rainy River.

An association of white sub-translucent quartz with some yellowish-gray mica schist, carrying small quantities of iron-pyrites. Weight of sample, nine ounces.

It contained neither gold nor silver.

45.—From a point on Bad Vermilion Creek, outlet of Bad Vermilion Lake, district of Rainy River. Examined for Mr. W. A. Allan.

An association of white sub-translucent quartz with some gray mica-schist and a little reddish-gray gneiss, in parts stained and coated with hydrated peroxide of iron and a little green carbonate of copper, carrying small quantities of iron-pyrites and copper-pyrites. Weight of sample, eight pounds two ounces. It was found to contain:

Gold	trace.
Silver	none.

46.—From mining location H. P. 222, Lower Manitou Lake, district of Rainy River. This, and the following specimen were received from Sir John Schultz.

A white crypto-crystalline quartz, in parts stained and coated with hydrated peroxide of iron, through which was disseminated a few small particles of iron-pyrites. Weight of sample, one pound fifteen ounces. Submitted to assay it was found to contain:

Gold	1·983 ounce to the ton of 2,000 lbs.
Silver	none.

47.—Another specimen from this location, consisting of a grayish-white crypto-crystalline quartz, more or less stained with hydrated peroxide of iron, with, here and there, a few scales of mica and an occasional crystal of iron-pyrites, was found to contain:

Gold	2·217 ounces to the ton of 2,000 lbs.
Silver	none.

48.—From mining location D. 140, south-west shore of Upper Manitou Lake, district of Rainy River. Examined for Mr. C. W. Mitchell.

An association of white translucent quartz with a little gray gneiss, stained and coated with hydrated peroxide of iron, through which was disseminated a few particles of iron-pyrites. Weight of sample, three pounds.

It contained neither gold nor silver.

49.—From mining location S. 28, just west of Mud Lake, two miles north of Upper Manitou Lake, district of Rainy River. This, and the six following specimens were examined for Mr. John McDonald.

An association of white sub-translucent quartz with a little white felspar and green chloritic mineral matter, in parts coated with hydrated peroxide of iron, carrying very small quantities of iron-pyrites. Weight of sample, one pound three ounces. Assays gave:

Gold.....	1·983	ounce to the ton of 2,000 lbs.
Silver.....	0·175	" "

50.—From mining location S. 25, which adjoins that from which the preceding specimen was taken.

A white sub-translucent quartz, in parts coated with hydrated peroxide of iron, carrying small quantities of iron-pyrites. Weight of sample, one pound. It contained:

Gold.....	1·283	ounce to the ton of 2,000 lbs.
Silver.....	0·117	" "

51.—From mining location S. 31, south-west shore of Upper Manitou Lake, district of Rainy River.

An association of reddish to yellowish-white quartz with a little green actinolite. Weight of sample, one pound six ounces.

It contained neither gold nor silver.

52.—From mining location S.—A. B., Upper Manitou Lake, district of Rainy River.

A white translucent quartz, more or less stained and coated with hydrated peroxide of iron and a little green carbonate of copper. Weight of sample, one pound nine ounces.

It contained neither gold nor silver.

53.—From mining location H. P. 366, between Mud Lake and Upper Manitou Lake, district of Rainy River.

A white sub-translucent quartz, more or less thickly coated with hydrated peroxide of iron, through which was disseminated a few particles of iron-pyrites. Weight of sample, one pound two ounces. It was found to contain:

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

54.—From mining location H. P. 376, which adjoins mining location S. 28—above, west of Mud Lake, district of Rainy River.

A grayish and reddish-white to white translucent quartz, with, here and there, a few specks of iron-pyrites. Weight of sample, six pounds. Assays showed it to contain:

Gold.....	trace.
Silver.....	none.

55.—From mining location H. P. 409, adjoining mining location S. 28—above, west of Mud Lake, district of Rainy River.

A white translucent quartz, more or less thickly coated with hydrated peroxide of iron. Weight of sample, one pound four ounces.

It contained neither gold nor silver.

56.—From a point twenty-five miles from Wabigoon tank on the line of the Canadian Pacific Railway, district of Rainy River. Examined for Mr. W. A. Allan.

A white translucent quartz, in parts coated with hydrated peroxide of iron, carrying small quantities of iron-pyrites. Weight of sample, four pounds two ounces. It was found to contain:

Gold.....	trace.
Silver.....	none.

57.—From vein A., near Windigo Point, north side of Eagle Lake, district of Rainy River. This, and the following specimen were collected by Mr. Wm. McInnes.

An association of white sub-translucent quartz with a gray schistose rock, carrying small quantities of pyrrhotite and iron-pyrites. Weight of sample, eight pounds fifteen ounces.

It contained neither gold nor silver.

58.—From vein B, near Windigo Point, north side of Eagle Lake, district of Rainy River.

A weathered felspathic rock, carrying large quantities of iron-pyrites. Weight of sample, one pound four ounces.

It contained neither gold nor silver.

District of Keewatin.

59.—This, and the two following specimens, are from quartz veins in the Huronian belt north of the western end of Lac Seul. They were examined for Mr. J. Williams.

A white translucent quartz, in parts coated with hydrated peroxide of iron, carrying small quantities of iron-pyrites. Weight of samples, three ounces.

It contained neither gold nor silver.

60.—An association of white translucent quartz with a little white dolomite, carrying small quantities of tetrahedrite and a few particles of iron-pyrites. Weight of sample, six ounces. Assays gave:

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

61.—A grayish-white crypto-crystallline quartz, in parts coated with hydrated peroxide of iron, through which were disseminated a few particles of iron-pyrites. Weight of sample, nine ounces.

It contained neither gold nor silver.

North-west Territory.

62.—From Schultz Lake, latitude 64° 37′, longitude 87° 45′. Geological position—Athabasca sandstones, Cambrian. This, and the following specimen were collected by Mr. J. B. Tyrrell.

A mottled red and white quartz conglomerate. Weight of sample, five ounces.

It contained neither gold nor silver.

63.—From Point south-east of Black Bay, Lake Athabasca. Geological position—Athabasca sandstones, Cambrian.

A white quartz conglomerate, in parts coated with hydrated peroxide of iron. Weight of sample, eight ounces.

It contained neither gold nor silver.

64.—Described as having been taken from a vein on the North Saskatchewan River, in the second range of the Rocky Mountains, district of Alberta. Examined for Mr. J. W. Peterson.

A grayish-white quartz, seamed with white calcite and associated with small quantities of black carbonaceous schist. Weight of sample, two pounds ten ounces.

It contained neither gold nor silver.

65.—Described as having been taken from a point on the North Saskatchewan River, in the second range of the Rocky Mountains, district of Alberta. Examined for Mr. A. D. McPherson.

A grayish-white quartzo-felspathic rock, thinly seamed with black carbonaceous matter and carrying small quantities of iron-pyrites. Weight of sample, one pound.

It contained neither gold nor silver.

66.—From the Miette River, a tributary of the Athabasca River, district of Athabasca. Examined for Mr. Jas. McDonald.

A white sub-translucent quartz, in parts thickly coated with hydrated peroxide of iron. Weight of sample, three pounds nine ounces.

It contained neither gold nor silver.

67.—From west slope of mountain east of Castle Mountain, Rocky Mountains—township 27, range 14, west of the fifth initial meridian, district of Alberta. Examined for Mr. P. McCarthy.

An association of dark gray to yellowish and milk-white dolomite with some milk-white quartz, here and there stained with hydrated peroxide of iron and green carbonate of copper, carrying small quantities of iron-pyrites and copper-pyrites. Weight of sample, one pound twelve ounces.

It contained neither gold nor silver.

68.—From the South Fork of Red Deer River, district of Alberta. Examined for Mr. J. R. Costigan.

Consisted of brown zinc-blende disseminated through a grayish-white dolomite. Weight of sample, three pounds four ounces. It was found to contain:

Gold..... none.
Silver..... 6·358 ounces to the ton of 2,000 lbs.

69.—From one mile east of summit of Kicking Horse Pass, Rocky Mountains, district of Alberta. Geological position—Bow River series, Cambrian. Collected by Dr. G. M. Dawson.

A grayish-white quartz conglomerate. Weight of sample, one pound.

It contained neither gold nor silver.

Province of British Columbia.

Of the following—

Specimens Nos. 70— 78 are from the East Kootenay district.
" 79—111 " West Kootenay district.
" 112—130 " Interior plateau region.
" 132—145 " Coast ranges and coast region; whilst specimen No. 131, is from the Cariboo district.

70.—From near watershed, vicinity of Vermilion Pass, in the Rocky Mountains—East Kootenay district. Examined for Mr. A. McDougall.

A very much honeycombed quartz, thickly coated with hydrated peroxide of iron. Weight of sample, twelve ounces.

It contained neither gold nor silver.

71.—From Salmon River, about a mile and a half from its entry into the Columbia—East Kootenay district. Examined for Mr. C. A. Watt.

Quartz, thickly coated with hydrated peroxide of iron. Weight of sample, twelve ounces.

It contained neither gold nor silver.

72.—From a point on Bluewater Creek, a tributary of the Columbia River, about fifteen miles northerly from Donald—East Kootenay district. Examined for Mr. Thos. Clark.

An association of white crypto-crystalline quartz with gray mica-schist and a grayish-white dolomite, in parts coated with hydrated peroxide of iron, carrying small quantities of coarsely crystalline galena and a little iron-pyrites. Weight of sample, one pound one ounce. Assays gave:

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

73.—From the vicinity of Otter Tail Creek—East Kootenay district.

Consisted of galena and tennantite together with very small quantities of iron-pyrites and copper-pyrites, in a gangue composed of quartz with a little dolomite and a few scales of silvery-white mica. Weight of sample, ten ounces. It was found to contain:

Gold..... 0·729 of an ounce to the ton of 2,000 lbs.
Silver..... 37·187 ounces to the ton of 2,000 lbs.

74.—From a vein ten feet in width, on Rover Creek, Kootenay River—East Kootenay district.

A white sub-translucent schistose quartz-rock, carrying small quantities of magnetite and iron-pyrites. Weight of sample, ten ounces. Assays showed it to contain:

Gold..... trace.
Silver..... none.

75.—From vicinity of Glacier House, Canadian Pacific Railway, Selkirks—East Kootenay district. Geological position—Selkirk series, Cambrian. Collected by Dr. G. M. Dawson.

A grayish-white quartz-mica schist, with small cavities filled with hydrated peroxide of iron. Weight of sample, one pound two ounces.

It contained neither gold nor silver.

76.—From a tenth of a mile east of the 448 mile-post, Canadian Pacific Railway, Selkirks—East Kootenay district. Geological position—Selkirk series, Cambrian. Collected by Dr. G. M. Dawson.

A grayish-white, fine-grained, quartz conglomerate. Weight of sample, two pounds three ounces.

It contained neither gold nor silver.

77.—From the Lake View claim, five miles east of St. Mary's Lake, and six miles from the White Grouse Mountain—East Kootenay district. This, and the following specimen were examined for Mr. R. Yuile.

A grayish-white quartz, carrying small quantities of pyrrhotite, magnetite, and iron-pyrites. Weight of sample, seven ounces. It was found to contain :

Gold..... distinct trace.
Silver..... 4·375 ounces to the ton of 2,000 lbs.

78.—Also from the Lake View claim.

An association of grayish-white quartz with small quantities of a white talcose schist, carrying a little iron-pyrites. Weight of sample, five ounces.

It contained neither gold nor silver.

79.—From the Nickel Plate mine, Trail Creek, Columbia River—West Kootenay district. This and the nine following specimens were collected by Mr. R. G. McConnell.

An intimate association of pyrrhotite and copper-pyrites, through which was disseminated small quantities of a quartzose gangue. Weight of sample, one pound. Assays gave :

Gold..... 1·283 of an ounce to the ton of 2,000 lbs.
Silver..... 3·383 ounces " "

80.—From the Le Roi mine, taken from the surface, Trail Creek, Columbia River—West Kootenay district.

An intimate association of pyrrhotite and copper-pyrites, through which was disseminated a small quantity of a calcareous gangue. Weight of sample, two pounds nine ounces. It was found to contain :

Gold..... 0·875 of an ounce to the ton of 2,000 lbs.
Silver..... 2·392 ounces " "

81.—From the Le Roi mine, taken from the bottom of the shaft—300 feet, Trail Creek, Columbia River—West Kootenay district.

An intimate association of pyrrhotite and copper-pyrites, through which was disseminated a trifling quantity of a calcareous gangue. Weight of sample, two pounds. Assays showed it to contain :

Gold..... 0·117 of an ounce to the ton of 2,000 lbs.
Silver..... 2·333 ounces " "

82.—From the War Eagle mine, Trail Creek, Columbia River—West Kootenay district.

An intimate association of pyrrhotite and copper-pyrites, through which was disseminated a trifling quantity of a quartzose gangue. Weight of sample, two pounds fifteen ounces. It contained :

Gold..... 0·292 of an ounce to the ton of 2,000 lbs.
Silver..... 0·642 " "

83.—From the Cliff mine, Trail Creek, Columbia River—West Kootenay district.

An intimate association of pyrrhotite with a little copper-pyrites, through which was disseminated a small quantity of a quartzose gangue. Weight of sample, four pounds twelve ounces. Assays gave :

Gold..... 0·058 of an ounce to the ton of 2,000 lbs.
Silver..... 0·233 " "

84.—From the Monte Cristo claim, Trail Creek, Columbia River—West Kootenay district.

An intimate association of pyrrhotite with a little copper-pyrites and small quantities of a quartzose gangue. Weight of sample, two pounds nine ounces. It contained :

Gold..... trace.
Silver..... trace.

85.—From the Kootenay claim, Trail Creek, Columbia River—West Kootenay district.

A very fine grained pyrrhotite with small quantities of intermixed copper-pyrites, associated with a little gangue composed of a grayish-white crypto-crystalline quartz and a fine granular limestone. Weight of sample, two pounds three ounces. It was found to contain :

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

86.—From the Ohio claim, Ten-mile Creek, Slocan Lake—West Kootenay district.

An association of grayish-white quartz with a little greenish-white steatite and white dolomite, through which was disseminated a small quantity—approximately ten per cent, by weight, of the whole—of a very finely crystalline galena. Weight of sample, seven ounces. Assays gave:

Gold..... trace.
Silver..... ..... 1·823 ounce to the ton of 2,000 lbs.

87.—From the Silver King mine, Toad Mountain—West Kootenay district.

A compact, massive tetrahedrite, containing, in parts, a little white translucent quartz. The tetrahedrite, freed from gangue, was found to contain:

Gold.... none.
Silver..... 0·2133 per cent, or at the rate of 62·212 ounces to the ton of 2,000 lbs.

88.—From mine below Pilot Bay, Kootenay Lake—West Kootenay district.

An association of white felspar with small quantities of white sub-translucent quartz and a few scales of mica. Weight of sample, two pounds seven ounces.

It contained neither gold nor silver.

89.—From between Carnes Creek and Downie Creek, Columbia River—West Kootenay district. Examined for Mr. John D. Boyd.

A grayish-white to white quartz, more or less coated with hydrated peroxide of iron, carrying small quantities of iron-pyrites. Weight of sample, ten ounces.

It contained neither gold nor silver.

90.—From the north-east arm of Upper Arrow Lake, about half a mile from the head, on the south-east side—West Kootenay district. This, and the following specimen were examined for Mr. James W. Vail.

An association of white opaque quartz with a little green chromiferous mica-schist, carrying small quantities of iron-pyrites. Weight of sample, six ounces. Assays gave:

Gold ... . trace.
Silver..... 0·117 of an ounce to the ton of 2,000 lbs.

91.—From the Gold Hill claim, about seven miles north-east of Illecillewaet on the line of the Canadian Pacific Railway—West Kootenay district.

A more or less weathered, coarsely crystalline galena with which was associated small quantities of a white sub-translucent quartz. Weight of sample, seven ounces. It was found to contain :

Gold..... none.
Silver..... .. . 12·396 ounces to the ton of 2,000 lbs.

92.—From Surprise No. 2 claim, on Glacier Creek, about three miles from Upper Kootenay Lake—West Kootenay district.

A white sub-translucent quartz, in parts stained with hydrated peroxide of iron and blue carbonate of copper, carrying small quantities of vitreous copper ore. Weight of sample, eight ounces. It contained :

Gold..... ..... distinct trace.
Silver..... ..... 37·917 ounces to the ton of 2,000 lbs.

93.—From Gold Dollar claim, on Glacier Creek, about eight miles from Upper Kootenay Lake—West Kootenay district.

White sub-translucent quartz, more or less coated with hydrated peroxide of iron, carrying small quantities of iron-pyrites. Weight of sample, four ounces. It contained :

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

94.—From the Spotted Horse mine, nineteen miles south of Nelson—West Kootenay district. Examined for Mr. W. J. H. McKernan.

An association of white translucent quartz with a little grayish-white ankerite, in parts thickly coated with hydrated peroxide of iron, carrying small quantities of iron-pyrites and pyrrhotite. Weight of sample, three pounds.

It contained neither gold nor silver.

95.—From a claim four miles west of Kaslo, west side of Kootenay Lake—West Kootenay district. Examined for Mr. Edward Baum.

An association of white quartz, grayish-white felspar, dark gray chloritic schist and a little green talcose mineral, carrying small quantities of iron-pyrites. Weight of sample, ten pounds.

It contained neither gold nor silver.

96.—From a claim about a mile above Roseberry, on the east shore of Slocan Lake—West Kootenay district. Examined for Mr. W. Thomlinson.

Consisted of an association of a dark green diorite with some black chloritic schist and a little white calcite, through which was disseminated small quantities of pyrrhotite. Weight of sample, five ounces.

It contained neither gold nor silver.

97.—From Jordan River, about twelve miles north of Revelstoke—West Kootenay district. Examined for Messrs. Righley and Frisby.

A white quartzo-felspathic rock, carrying small quantities of iron-pyrites, galena and stibnite. Weight of sample, fourteen ounces. It was found to contain :

Gold..... trace.
Silver..... 1·458 ounce to the ton of 2,000 lbs.

98.—From Jordan River, a tributary of the Columbia, about twenty miles west of Revelstoke—West Kootenay district. Examined for Mr. Thomas Horn.

It consisted of zinc-blende with a little iron-pyrites, in a gangue of white translucent quartz. The specimen, which was, in parts, coated with hydrated peroxide of iron, weighed one pound one ounce. Assays showed it to contain :

Gold..... none.
Silver..... 0·406 of an ounce to the ton of 2,000 lbs.

99.—From the Nancy Hanks claim, Kaslo-Slocan mining camp—West Kootenay district. This, and the following specimen were examined for Mr. J. Mahoney.

A slightly weathered gray dolomitic schistose rock, carrying small quantities of iron-pyrites. Weight of sample, four pounds twelve ounces. It contained :

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

100.—Also from the Nancy Hanks claim.

A gray dolomitic schistose rock, carrying small quantities of iron-pyrites. Weight of sample, four pounds thirteen ounces. Assays gave :

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

101.—From the Gray Copper mine, southern slope of Reco Mountain, about one mile north of the South Fork of Carpenter Creek, Kaslo-Slocan mining camp—West Kootenay district. Examined for Mr. J. A. Whittier.

An association of brownish-black zinc-blende with a very little coarsely crystalline galena, traversed by thin seams of white calcite. Weight of sample, ten ounces. It was found to contain :

Gold..... none.
Silver..... 45·208 ounces to the ton of 2,000 lbs.

102.—From the Noonday claim, Bird Creek, Kootenay River, about eleven miles below Nelson—West Kootenay district. Examined for Mr. Michael Egan.

An association of white sub-translucent quartz with iron-pyrites and a few specks of magnetite. Weight of sample, thirteen ounces. It was found, on assay, to contain:

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

103.—From about two miles from the Silver King mine, Toad Mountain—West Kootenay district. Examined for Mr. J. J. Driscoll.

An association of white sub-translucent quartz with some dark gray, fine to coarse crystalline limestone and a little dark green chloritic schist, carrying very small quantities of pyrrhotite and iron-pyrites. Weight of sample, two pounds.

It contained neither gold nor silver.

104.—From Keystone Creek, Columbia River, about forty-two miles above Revelstoke—West Kootenay district. This, and the following specimen were examined for Mr. A. W. McIntosh.

A gneissoid rock, carrying somewhat large quantities of pyrrhotite and iron-pyrites. Weight of sample, five ounces.

It contained neither gold nor silver.

105.—Described as coming from a ledge some forty miles up the Columbia River from Revestoke—West Kootenay district.

A white quartzo-felspathic rock, in parts stained and coated with hydrated peroxide of iron, carrying some iron-pyrites and coarsely crystalline galena. Weight of sample, one pound one ounce. It was found to contain:

Gold..... none.
Silver..... 4·842 ounces to the ton of 2,000 lbs.

106.—From the King Solomon mine, two miles west of Kaslo, Kaslo-Slocan mining camp—West Kootenay district. This, and the following specimen were examined for Mr. H. E. Porter.

A compact, massive pyrrhotite, with which was associated a small amount of white sub-translucent quartz. Weight of sample, two pounds eleven ounces. It contained:

Gold..... trace.
Silver..... none.

107.—Also from the King Solomon mine.

A compact, massive pyrrhotite. Weight of sample, nine ounces. Assays showed it to contain:

Gold..... 1·808 ounce to the ton of 2,000 lbs.
Silver..... none.

108.—From the Little Giant claim, Duncan River—West Kootenay district. Examined for Mr. W. Billings.

A white crypto-crystalline quartz, in parts coated with hydrated peroxide of iron and a little green carbonate of copper, carrying small quantities of iron-pyrites and a few particles of copper-pyrites. Weight of sample, six ounces. Assays gave:

Gold..... none.
Silver..... 0·233 of an ounce to the ton of 2,000 lbs.

109.—From the Highland claim, Rock Creek, about six miles north of Rossland—West Kootenay district. Examined for Mr. Jay Benn.

It consisted of iron-pyrites and copper-pyrites with some pyrrhotite and a very little dark brown zinc-blende, in a quartzose gangue. Weight of sample, six pounds six ounces. It was found to contain:

Gold..... 0·058 of an ounce to the ton of 2,000 lbs.
Silver..... 0·583 " "

110.—From the Mollie Hughes claim, Slocan Lake, Kaslo-Slocan mining camp—West Kootenay district. This, and the following specimen were examined for Mr. Felix Hughes.

An association of white sub-translucent quartz with a little white crystalline calcite, in parts stained and coated with hydrated peroxide of iron, carrying small quantities of galena and a few particles of iron-pyrites and copper-pyrites. Weight of sample one pound five ounces. It contained:

Gold..... 0·700 of an ounce to the ton of 2,000 lbs.
Silver..... 379·050 ounces " "

111.—Also from the Mollie Hughes claim.

A white sub-translucent quartz, here and there coated with hydrated peroxide of iron, carrying small quantities of galena, a very little zinc-blende, and a few particles of iron-pyrites. Weight of sample, one pound eight ounces. Assays gave:

Gold..... 0·408 of an ounce to the ton of 2,000 lbs.
Silver..... 137·108 ounces " "

112.—From the Bunbury claim, near Lac le Bois—Interior plateau region.

A dark gray to grayish-white felspathic rock, carrying small quantities of pyrrhotite. Weight of sample, twelve ounces.

It contained neither gold nor silver.

113.—From the Humphrey claim, near Lac le Bois—Interior plateau region.

A grayish-white quartzo-felspathic rock, carrying small quantities of pyrrhotite. Weight of sample, four ounces. It contained:

Gold	trace.
Silver	none.

114.—From Jamieson Creek, North Thompson River—Interior plateau region. Collected by Dr. G. M. Dawson.

A somewhat fine-grained, slightly weathered granite. Weight of sample, twelve ounces.

It contained neither gold nor silver.

115.—From Fairview—Interior plateau region. Examined for Mr. W. T. Thompson.

A compact, massive, slightly weathered pyrrhotite. Weight of sample, two ounces. It was found to contain:

Gold	trace.
Silver	none.

116.—From the west side of Copper Creek valley, about four miles up from the north shore of Kamloops Lake—Interior plateau region. Examined for Mr. Samuel Macartney.

An association of weathered felsitic rock with a little dolomite, carrying small quantities of iron-pyrites and magnetite. Weight of sample, seven ounces.

It contained neither gold nor silver.

117.—From Iron Mountain, at the junction of the Coldwater and Nicola rivers—Interior plateau region. This, and the following specimen were examined for Mr. John Mackie.

A white quartz, in parts coated with hydrated peroxide of iron and blue and green carbonate of copper, carrying small quantities of copper-pyrites, pyrrhotite, specular iron and earthy hematite. Weight of sample, two pounds three ounces. Assays showed it to contain:

Gold	0·350	of an ounce to the ton of 2,000 lbs.
Silver	0·700	" "

118.—From the same locality as the preceding specimen.

Consisted of quartz thickly coated with hydrated peroxide of iron and green carbonate of copper. Weight of sample, two pounds. It was found to contain:

Gold	trace.
Silver	none.

119.—From a well-defined vein, seven feet in width, on Twenty-Mile Creek, Similkameen River—Interior plateau region. Examined for Mr. H. B. Cameron.

A massive pyrrhotite, through which was disseminated a small amount of quartzose gangue. Weight of sample, nine ounces.

It contained neither gold nor silver.

120.—From the South Fork of the Similkameen River—Interior plateau region. Examined for Mr. John Mackie.

An association of a reddish-gray to grayish-white quartzo-felspathic rock with a little calcite, carrying small quantities of magnetite and a few grains of iron-pyrites. Weight of sample, two pounds.

It contained neither gold nor silver.

121.—From south-west of Savonas on the line of the Canadian Pacific Railway—Interior plateau region. Geological position—Lower Tertiary. Collected by Dr. G. M. Dawson.

A coarse conglomerate. Weight of sample, one pound thirteen ounces. Assays showed it to contain:

Gold	trace.
Silver	none.

122.—From township 45, East Riding of Yale district—Interior plateau region. This, and the two following specimens were examined for Mr. Felix Bonneau.

A schistose rock, consisting of an intimate association of a granular white felspar with scales of brown mica. Weight of sample, four ounces.

It contained neither gold nor silver.

123.—From township 3, East Riding of Yale district—Interior plateau region.

A white sub-translucent quartz, carrying large quantities of iron-pyrites. Weight of sample, three ounces and a half. Assays gave:

Gold	trace.
Silver	none.

124.—From township 45, East Riding of Yale district—Interior plateau region.

A white sub-translucent quartz, more or less thickly coated with hydrated peroxide of iron. Weight of sample, one pound two ounces.

It contained neither gold nor silver.

125.—From Scotch Creek, Shuswap Lake—Interior plateau region. This, and the four following specimens were collected by Mr. J. McEvoy.

A white sub-translucent quartz, in parts stained and coated with hydrated peroxide of iron. Weight of sample, thirteen ounces.

It contained neither gold nor silver.

126.—From McGillvray Creek, Louis Creek, North Thompson River—Interior plateau region.

An association of white sub-translucent quartz with a little white felspar, seamed with hydrated peroxide of iron. Weight of sample, one pound three ounces.

It contained neither gold nor silver.

127.—From Harry's Creek, White Valley, east of Vernon—Interior plateau region.

A white cavernous quartz, stained and coated with hydrated peroxide of iron, with here and there, a few minute particles of iron-pyrites. Weight of sample, fifteen ounces.

It contained neither gold nor silver.

128.—From near Mara, Shuswap and Okanagan Railway—Interior plateau region.

An association of white sub-translucent quartz with some white calcite, in parts stained with hydrated peroxide of iron, through which were disseminated a few particles of iron-pyrites. Weight of sample, one pound two ounces.

It contained neither gold nor silver.

129.—From near Shuswap and Okanagan Railway, between Enderby and Mara—Interior plateau region.

A fine-grained grayish-white granite, stained and coated with hydrated peroxide of iron. Weight of sample, one pound seven ounces.

It contained neither gold nor silver.

130.—From Sullivan Creek, North Thompson River—Interior plateau region. Collected by Dr. G. M. Dawson.

A somewhat fine-grained light gray granite. Weight of sample, thirteen ounces.

It contained neither gold nor silver.

131.—From Shepherd Creek, about eight miles north-east of Barkerville, on Williams Creek—Cariboo district.

A concretionary nodule of iron-pyrites, weighing four ounces and a half.

It contained neither gold nor silver.

These nodules of pyrite are very plentifully met with in washing for gold on the creek in question.

132.—From a vein some thirty-six feet wide, on claim 58367, Phillips Arm—Coast ranges and coast region. This, and the following specimen were examined for Mr. R. W. Gordon.

The sample consisting of a finely powdered white siliceous rock, weighed four ounces. It was found to contain :

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

133.—Another sample of finely crushed material from this vein, weighing a little over four ounces, was found to contain :

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

134.—From the so-called Iron Ledge No. 10, Deer Creek, Clayoquot, Vancouver Island—Coast ranges and coast region. Examined for Mr. F. Jacobsen.

A massive iron-pyrites, with which was associated small quantities of copper-pyrites. Weight of sample, two pounds two ounces. Assays gave :

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

135.—From vicinity of, or near, Victoria—Coast ranges and coast region.

An association of black hornblende and white felspar, carrying small quantities of iron-pyrites. Weight of sample, eight ounces.

It contained neither gold nor silver.

136.—From Boothroyd's Flat, thirty-four miles above Yale, on old wagon road—Coast ranges and coast region. This, and the following specimen were examined for Mr. H. B. Monroe.

An association of grayish-white quartz with a little gray chloritic schist, stained and coated with hydrated peroxide of iron. Weight of sample, thirteen ounces.

It contained neither gold nor silver.

137.—From the same locality as the preceding specimen.

Consisted of a dark gray, slightly weathered quartzo-felspathic rock. Weight of sample, six ounces. It contained:

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

138.—From Lawn Hill, near the entrance to Skidegate Inlet, Queen Charlotte Islands—Coast ranges and coast region.

A specimen of the volcanic tufa of this locality was examined, at the special request of Mr. A. L. Poudrier, and with the following result:

It contained neither gold nor silver.

139.—From a vein, ten feet in width, on Princess Royal Island—Coast ranges and coast region. This, and the two following specimens were examined for Mr. John Rood.

It consisted of iron-pyrites in a gangue composed of an association of white sub-translucent quartz with a little grayish-white serpentine. Weight of sample, one pound eight ounces. Assays showed it to coutain:

Gold..... 0·467 of an ounce to the ton of 2,000 lbs.
Silver... 0·292 " "

140.—From the same vein as the preceding specimen.

A slightly weathered copper-pyrites. Weight of sample, twelve ounces. Submitted to assay, it was found to contain:

Gold... none.
Silver... 2·100 ounces to the ton of 2,000 lbs.

141.—From a vein, seventy-five feet in width, on Banks Island—Coast ranges and coast region.

A massive pyrrhotite, inclosing large cubic crystals of iron-pyrites, some fragments of translucent quartz, and fine filaments of actinolite. Weight of sample, nine ounces.

It contained neither gold nor silver.

142.—From the Victoria claim, Texada Island—Coast ranges and coast region. Examined for Mr. J. H. Munson.

A grayish-white sub-translucent quartz, carrying small quantities of iron-pyrites. Weight of sample, one pound. Assays gave:

Gold... trace.
Silver... none.

143.—From the upper waters of the Tulameen River—Coast ranges and coast region. Examined for Mr. H. B. Cameron.

An association of white quartzo-felspathic rock with some gray mica-schist, carrying galena, pyrrhotite, and brownish-black zinc-blende. Weight of sample, ten ounces. It contained:

Gold	trace.
Silver	4·812 ounces to the ton of 2,000 lbs.

144.—From Bear River, Clayoquot, Vancouver Island—Coast ranges and coast region. Examined for Mr. F. Jacobsen.

A grayish-white quartz, carrying small quantities of iron-pyrites and copper-pyrites. Weight of sample, one pound. It was found to contain:

Gold	none.
Silver	1·458 ounce to the ton of 2,000 lbs.

145.—From Eburne, Lulu Island—Coast ranges and coast region. Received from Mr. Albert J. Hill.

A fine light-gray sand. Weight of sample, four ounces.

It contained neither gold nor silver.

NATURAL WATERS.

1.—From a spring on the west bank of the Manicouagan River, about five miles from its mouth, Saguenay county, province of Quebec.

The sample received for examination, contained a very small quantity of flocculent organic matter in suspension—this was removed by filtration. The filtered water was colourless and odourless; taste, mildly saline; reaction, neutral. Its specific gravity, at 15·5° C., was found to be 1·007. Boiling produced a slight precipitate, consisting of carbonate of lime with a little carbonate of magnesia.

Agreeably with the results of an analysis conducted by Mr. F. G. Wait, 1000 parts, by weight, of the filtered water, at 15·5° C., contained:

Potassa	0·100
Soda	3·877
Lime	0·174
Magnesia	0·261
Ferrous oxide	trace.
Chlorine	4·533
Sulphuric acid	0·519
Carbonic acid	0·315
Silica	0·005
Organic matter	trace.
	9·784
Less oxygen, equivalent to chlorine	1·021
	8·763

The foregoing acids and bases may reasonably be assumed to be present in the water in the following state of combination:

(The carbonates being calculated as mono-carbonates, and all the salts estimated as anhydrous.)

Chloride of potassium	0·158
" sodium	6·669
" magnesium	0·550
Sulphate of soda	0·786
" lime	0·128
Carbonate of lime	0·218
" magnesia	0·063
" iron	trace.
Silica	0·005
Organic matter	trace.
	8·577
Carbonic acid, half-combined	0·129
" free	0·057
	8·763

Total dissolved solid matter, by direct experiment, dried at 180° C., 8·600.

An imperial gallon of the water, at 15·5° C., would contain:

(The carbonates being calculated as anhydrous bi-carbonates, and the salts without their water of crystallisation.)

Chloride of potassium	11·137
" sodium	470·098
" magnesium	38·769
Sulphate of soda	55·405
" lime	9·023
Bi-carbonate of lime	22·134
" magnesia	6·767
" iron	trace.
Silica	0·352
Organic matter	trace.
	613·685
Carbonic acid, free	4·018
	617·703

The water was examined for lithium, barium, strontium, bromine and iodine, but no evidence of the presence of either of these was obtained.

2.—Water from a spring in New Town, Lunenburg county, province of Nova Scotia. Examined for Mr. J. A. Hirtle.

The sample received, contained a trifling amount of flocculent organic matter in suspension. This was removed by filtration. The filtrated water was bright, colourless, odourless, and devoid of any marked taste. Reaction, neutral—both before and after concentration. It contained only 0·06 parts of dissolved saline matter.

dried at 180° C., in 1,000 parts, by weight, of the water—equivalent to 4·20 grains per imperial gallon.

A qualitative analysis by Mr. Wait, showed it to contain:

Soda	strong traces.
Lime	very small quantity.
Magnesia	traces.
Chlorine	strong traces.
Sulphuric acid	very small quantity.
Carbonic acid	traces.
Organic matter	faint traces.

Boiling produced no perceptible precipitate. This water closely resembles, in its general character, that obtained from what was described as a neighbouring spring, the results of the examination of which are given in the Annual Report of this survey for 1894—vol. vii., p. 59 R.

3.—Water from a well in the village of Wakefield, township of Wakefield, Ottawa county, province of Quebec.

The sample sent for examination, contained a small amount of reddish-brown flocculent matter in suspension. This was removed by filtration. It consisted of hydrated peroxide of iron with a little organic matter. The filtered water was devoid of any marked colour, or odour. Taste, somewhat insipid—flat Reaction neutral—both before and after concentration.

Agreeably with the results of a qualitative analysis, conducted by Mr. F. G. Wait, it contained:

Soda	small quantity.
Lime	small quantity.
Magnesia	small quantity.
Ferrous oxide	trace.
Chlorine	small quantity.
Sulphuric acid	trace.
Carbonic acid	small quantity.
Organic matter	faint trace.

The total dissolved saline matter, dried at 180° C., amounted to 0·23 parts per 1,000—equivalent to 16·1 grains per imperial gallon. Boiling produced a slight precipitate, consisting of carbonates of lime and magnesia.

4.—Water, town supply, from Rossland, West Kootenay district, province of British Columbia.

The sample received for examination, contained a trifling amount of sedimentary matter—this was removed by filtration. The filtered water was bright; had a faint greenish-yellow tinge; was

odourless, and devoid of any marked taste. Reaction, neutral—both before and after concentration. It was found to contain 0·046 parts of dissolved saline matter, dried at 180° C., in 1,000 parts, by weight, of the water—equivalent to 3·22 grains in the imperial gallon.

A qualitative analysis by Mr. Wait, showed it to contain:

Soda	trace.
Lime	very small quantity.
Magnesia	very small quantity.
Alumina	faint trace.
Ferrous oxide	trace.
Chlorine	trace.
Sulphuric acid	small quantity.
Carbonic acid	trace.
Silica	trace.
Organic matter	faint trace.

Boiling produced a very slight precipitate, consisting of carbonates of lime and magnesia with a trace of hydrated peroxide of iron.

5.—Water, town supply, from Nelson, West Kootenay district, province of British Columbia.

The sample sent for examination, contained a small quantity of sedimentary matter, which was removed by filtration. It consisted of hydrated peroxide of iron with a trifling amount of white, flocculent, organic matter. The filtered water had a faint greenish-yellow tinge; was odourless, and devoid of any marked taste. Reaction, neutral—both before and after concentration. It was found to contain 0·144 parts of dissolved saline matter, dried at 180° C., in 1,000 parts, by weight, of the water—equivalent to 10·08 grains per imperial gallon.

A qualitative analysis, conducted by Mr. Wait, showed it to contain:

Soda	very small quantity.
Lime	rather small quantity.
Magnesia	small quantity.
Alumina	trace.
Ferrous oxide	very small quantity.
Chlorine	very small quantity.
Sulphuric acid	somewhat large quantity.
Carbonic acid	small quantity.
Silica	trace.
Organic matter	trace.

Boiling produced a slight precipitate, consisting of carbonates of lime and magnesia with a little hydrated peroxide of iron.

MISCELLANEOUS EXAMINATIONS.

1.—Carbonaceous shale. From near Bryden's Mill, Benacadie Glen, Cape Breton county, province of Nova Scotia. Examined for Mr. F. E. Carié.

The composition of this material was found to be, as follows—Graphitic carbon 34·5, rock matter 59·9, water 5·6 = 100·0. On incineration, the graphitic carbon burns off slowly, leaving a light dull reddish-brown coloured residue.

2.—Carbonaceous shale. From Fisherman Creek, eight miles up the North Fork of Kettle River, Yale district, province of British Columbia. Examined for Mr. J. H. Featherston.

Its examination afforded the following results—Carbonaceous matter 28·3, rock matter 65·4, water 6·3 = 100·0.

3.—Coal. From a seam on Rock Creek, one mile above its mouth, Kettle River, Yale district, province of British Columbia.

This was, at the request of Mr. J. H. Clems, examined in regard to its content of inorganic matter. The sample received, left on incineration 16·53 per cent of a brownish-red coloured ash.