GEOLOGICAL SURVEY OF CANADA · 1842 ·

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DEPARTMENT OF MINES AND TECHNICAL SURVEYS

BULLETIN 115

CHEMICAL ANALYSES OF CANADIAN ROCKS, MINERALS, AND ORES

Compiled from the records of the Geological Survey of Canada for the period 1846-1955

J. A. Maxwell, *et al.*

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PREFACE

In recent years we have seen a great increase in laboratory research directed towards the solution of geological problems, and one of the more imposing results has been the accumulation of vast numbers of chemical data. These data have been scattered through a wide variety of publications in such a way that few investigators are aware of their presence. As a result there is wasted effort because of unnecessary duplication of analyses already done, or in the failure to utilize these analyses because their existence is not known. As a result of these considerations it was decided to bring as many as possible of these data into a form readily useable by anyone interested in this particular aspect of geological research.

This compilation of chemical analyses of rocks and minerals is taken from the literature and files of the Geological Survey of Canada and is the first part of a project designed to compile all available Canadian geochemical data. It includes analyses made from the beginning of the Survey's history up to the end of 1955.

J. M. Harrison,
Director, Geological Survey of Canada

OTTAWA, May 29, 1963

Бюллетень 115 — Химические анализы пород, минералов и руд Канады

Материал собрали: Джон А. Максвелл, К. Р. Даусон, Маргарита Э. Томильсон, Доротея М. Э. Покок и Диана Тетро

Компиляция 1310 полных и частичных химических анализов пород и минералов, взятых из опубликованных и неопубликованных работ Геологической Службы Канады. Период охватывает 1846 - 1955 гг.

Bulletin 115—Chemische Analysen kanadischer Gesteine, Mineralien und Erze

Von J. A. Maxwell, K. R. Dawson, Margaret E. Tomilson, Dorothy M. E. Pocock und Diane Tetreault

1310 chemische Analysen von Gesteinen und Mineralien zusammengestellt aus den Veröffentlichungen und Akten der Geological Survey of Canada für den Zeitraum 1846 - 1955.

CONTENTS

CHEMICAL ANALYSES OF CANADIAN ROCKS, MINERALS, AND ORES

Abstract

Chemical analyses of rocks and minerals, complete and partial, from the publications and files of the Geological Survey of Canada are compiled for the period 1846–1955. Only those analyses originally published by the Survey or contained in unpublished Survey reports are listed. Included are 298 igneous, 185 metamorphic, and 347 sedimentary rocks, 383 minerals, and 97 ores.

Each analysis is accompanied by its name, geographic location (both descriptive and according to the National Topographic System Index), geological occurrence, petrographic description, and reference. The specific gravity of the specimen is provided when known, and norms have been calculated for most of the igneous rocks.

The analyses have been numbered in increasing order from the igneous intrusive rocks through the ores, and related analyses are indicated by a cross reference system. A name index and a geographic index are provided, as well as a list of the references from which the analyses are taken.

Résumé

Il s'agit ici d'une compilation, pour la période de 1846 à 1955, des analyses chimiques (complètes et partielles) des roches et des minéraux tirées des publications et des archives de la Commission géologique du Canada. Ne sont mentionnées que les analyses originalement publiées par la Commission ou contenues dans ses rapports inédits. Ces analyses se rapportent à 298 roches ignées, 185 roches métamorphiques, 347 roches sédimentaires, 383 minéraux et 97 minerais.

Chaque analyse est accompagnée de son nom, de son emplacement géographique (description et emplacement d'après l'index du Système topographique national), de la venue géologique, de la description pétrographique et de la référence. On donne la gravité spécifique de l'échantillon quand elle est connue et les normes ont été calculées pour la plupart des roches ignées.

Les analyses ont été numérotées par ordre ascendant à partir des roches ignées intrusives jusqu'aux minerais, et les analyses associées sont indiquées par un système de renvois. On a établi un index des noms et un index géographique de même qu'une liste des ouvrages d'où on a tiré les analyses.

INTRODUCTION

This compilation of rock and mineral analyses is the first part of a long-term project, which has as its goal the compilation and publication of all available Canadian geochemical data in suitable form. The need for such was emphasized by The National Advisory Committee on Research in the Geological Sciences, and in 1957 the Geological Survey assigned the project to Drs. J. A. Maxwell and K. R. Dawson. Miss Margaret Tomilson made the literature searches and organized the data into the present format; she was assisted by Miss Dorothy Pocock, who continued with the organization and preparation of manuscript, assisted in turn by Miss Diane Tetreault.

In general, the presentation follows the format used in compiling similar data from the Geological Survey of Great Britain by Eileen M. Guppy (1931, 1956); some modifications have been made in order to conform more closely with the series of bibliographies of rock analyses being published by the United States Geological Survey (Hooker, 1959; Woodland, 1960). The data are taken from the publications and files of the Geological Survey of Canada for the period 1846–1955 (with a few references later than 1955), and include published and unpublished analyses. Assays are not included.

Presentation of the Data

The analyses are grouped in five major categories, primarily according to rock type, and arrangement within each category is as follows:

I. *Igneous intrusive and igneous extrusive rocks:* grouped in clans and within each clan arranged in order of decreasing silica percentage.

II. *Metamorphic rocks:* grouped in lithologic groups and within each group arranged in order of decreasing silica percentage or of increasing carbon dioxide percentage, whichever is applicable.

III. *Sedimentary rocks:* grouped in lithologic groups and within each group arranged in order of decreasing silica percentage or of increasing percentage of magnesium oxide, whichever is applicable.

IV. *Minerals:* arranged in order of listing in Dana's *Textbook of Mineralogy*[1]
V. *Ores:* arranged in groups according to the oremaking elements and, within these, in order of decreasing percentage of these elements.

This arrangement occasionally results in the separation of analyses of related rocks or minerals, but when this occurs the analyses are cross referenced. An arbitrary number (in progressive order from *Igneous Intrusive* rocks through to the end of *Ores)* has been assigned to each analysis in the publication, and thus related analyses can be easily found.

The following data are given with each analysis:

(a) The name originally assigned by the author, or collector, is retained unless a later study proved it to be incorrect. Where this is so, the correct name is used. Varietal names and names in current use are so indicated in brackets.

(b) The geographic location, accompanied by the appropriate National Topographic System Index Number.

(c) The name of the analyst, in brackets.

(d) The serial number, which is the number of the coded reference card. This number consists of two parts: the year of analysis (or publication) and an arbitrary number that indicates the numerical position of the analysis in that year. A card with the number *1925–41* will therefore carry analysis number 41 in the year 1925.

(e) The geological occurrence, when known.

(f) The figures given in the chemical analyses have been checked with the laboratory files when possible to do so. Because errors are frequently made when analyses are quoted, more reliance is placed on the data as originally published in preference to quoted ones; known errors are corrected or indicated as such.

(g) The petrographic description is an abstract of that given by the author or collector. Mineral names originally used by the author, or collector, are retained; a few of these are no longer in common use, e.g., fluorspar (now fluorite) and titanite (now sphene). The availability of a mode is indicated by the symbol (M) placed at the end of the description.

(h) The specific gravity, when known.

(i) Reference to the source, whether published or unpublished. For published sources, reference is made to the *first* publication of an analysis and the author's name is given, followed in brackets by the date of the publication in which the analysis occurs and the page reference. For an unpublished analysis, occurring in manuscripts or notebooks in the files of the Geological Survey, the name of the author is enclosed in brackets. Unpublished analyses lacking the name of the author or collector were obtained from laboratory files.

References section follows the usual bibliographic rules and contains only reference to published material.

[1]Dana, E.S.: A Textbook of Mineralogy, 4th ed., rev. by W.E. Ford; John Wiley and Sons (1932).

In the *Name Index* the rocks and minerals are listed in alphabetical order, with a cross reference to the assigned analysis number. Secondary names are listed as subdivisions when given, i.e., *olivine diabase* will be found under *diabase.*

The *Geographic Index* contains an alphabetical index of locations by provinces and territories, and within these categories by the National Topographic System Index Numbers, with a cross reference to the assigned analysis number.

Compilation Problems

The Geological Survey of Canada began publishing rock and mineral analyses in 1846 – a period of 110 years can give rise to many analyses, many sources, and many errors. The most serious problem encountered is perhaps that of discrepancies in the statement of the chemical analysis. An incorrect total for an analysis may be explained in several ways; it may be due to a mistake in addition (probably the least likely explanation), to the redetermination or deletion of one or more of the constituents without correction of the total, or to a printing error in either the constituent percentages or the total. Whatever the explanation, it usually evades detection, especially in the older analyses. Where a mistake was obvious the necessary corrections have been made; where the error cannot be rectified both totals are included with the numerically correct one being designated by ( ).

Archaic chemical terms often occur in the statements of analysis contained in the early literature. If doubt remained as to the exact meaning of the expression, the expression was retained. A blank space in the statement of analysis means that the constituent was not determined.

Acknowledgment

The authors sincerely appreciate the generous and helpful advice given by Miss Marjorie Hooker, United States Geological Survey.

ANALYSES OF IGNEOUS ROCKS

Intrusive Rocks

1. GRANITE NODULE. In fine-grained reddish granite; Pine Lake, Cardiff tp., con. 3, lots 13 and 15, Haliburton co., Ont.

   31–D–E½ (Anal. N. Norton Evans) Ser. No. *1910–21*

   Nodules are spherical to elliptical, 1 inch to 8 inches in diameter, harder than the enclosing granite and scattered or arranged in lines. They differ in internal structure from granite, tending to be zoned. Quartz, muscovite, and sillimanite are the chief constituents. Plagioclase and probably orthoclase are present in varying amounts, also tourmaline, iron ore, and pyrite.

   F.D. Adams and A.E. Barlow (1910, pp. 127–134) *See also* No. 2 *(1910–21)*

2. GRANITE. Fine-grained reddish nodular granite; Pine Lake, Cardiff tp., con. 3, lots 13 and 15, Haliburton co., Ont.

   31–D–E½ (Anal. N. Norton Evans) Ser. No. *1910–21*

   In many places massive, generally gneissic and uniform over a large area. Uniform in composition. Orthoclase and microcline preponderate, with minor soda-lime feldspars and less abundant quartz; biotite, muscovite, iron ore, and apatite also present.

   F.D. Adams and A.E. Barlow (1910, pp. 127–134) *See also* No. 1 *(1910–21)*

3. APLITE. Cuts granitized amphibolite; in Crestaurum area, Ryan Lake, Yellowknife, District of Mackenzie.

   85–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1954–13*

   R.W. Boyle (1961, p. 72)

4. BIOTITE GRANITE (QUARTZ MONZONITE). In contact with migmatitic and granite gneiss; about 1,000 feet west of Runa Lake, south of Thubun Lake, O'Connor Lake area, District of Mackenzie.

   75–E–W½ (Anal. J.A. Maxwell) Ser. No. *1955–2*

	1	2	3	4	5
SiO_2	81.43	78.83	78.80	78.45	77.86
Al_2O_3	13.70	10.88	10.73	11.70	11.96
Fe_2O_3	1.58	1.63	1.78	0.43	0.21
FeO			0.39	0.85	0.32
MgO	0.06	0.35	0.62	0.35	0.29
CaO	0.37	0.22	1.63	2.15	1.92
Na_2O	1.02	2.13	2.10	2.70	5.67
K_2O	1.28	5.31	2.43	2.56	0.31
H_2O+	0.92	0.32	0.27	0.22	0.60
H_2O-			0.26	0.07	
TiO_2			0.31	0.15	0.25
P_2O_5			0.15	0.06	0.04
MnO			0.06	0.02	0.02
CO_2			nil	0.06	
S			0.16		
Total	100.36	99.67	99.69	99.77	99.45
Less O ≡ S			0.06		
			99.63		

NORMS

	1	2	3	4	5
QTZ	67.80	43.18	51.45	45.39	37.52
CO	11.39	1.36	2.30	.79	–
OR	7.94	32.42	14.97	15.59	1.85
AB	9.59	19.72	19.61	24.94	51.54
AN	1.92	1.12	7.40	10.59	6.34
LC	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	–	–	.32	.12	.08
RU	–	–	.05	–	–
IL	–	–	.33	.21	.35
PY	–	–	.43	–	–
HE	1.15	1.16	1.28	–	–
MT	–	–	–	.46	.22
EN	.17	1.00	1.79	1.00	.81
FS	–	–	–	.86	.03
OL	–	–	–	–	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	–	–	–
WO	–	–	–	–	1.22

Porphyritic biotite granite with phenocrysts of orthoclase and albite (maximum size 1.5 cm by 1.0 cm) and interstitial quartz. Some microcline is also present. Biotite bands contain sulphides and apatite.

B.D. Prusti (1954) *See also* Nos. *23, 369, 361 (1955–4, 1954–38, 42)*

5. APLITE. Fissure filling, replacement veins and apophyses in gabbro mass; East Sooke Peninsula, Vancouver Island, B.C.

92–B–W½ (Anal. M.F. Connor) Ser. No. *1919–25*

Equigranular, nearly pure, white aplite. Free quartz is always present; very sodic feldspar is graphically intergrown with the quartz. Hornblende, chlorite, mica, and titanite are present.

H.C. Cooke (1919, p. 18) *See also* Nos. 184, 341 *(1919–23. 24)*

6. GRANITE. Red granite intermingled with grey granite; Anjigami, on the Algoma Central Railway on Tabor Creek between Brulé Bay and Old Woman Bay, Lake Superior, Algoma district, Ont.

41–N–E½ (Anal. A.F. Matheson) Ser. No. *1932–30*

Massive red granite, medium to coarse grained, very similar in texture to the grey granite with which it is in contact, and consisting of plagioclase (near oligoclase), orthoclase, a little microcline and 25 to 30% quartz. Accessories are few and the alteration products kaolin, epidote, sericite, chlorite, and leucoxene form not more than 7% of the rock.

A.F. Matheson (1933, p. 6)

7. GRANITE (QUARTZ MONZONITE). Sheppard granite, intrusive in the Pend d'Oreille schists, the Rossland volcanic rocks, the Trail granodiorite, and the Lake Mtn. conglomerate; outcropping at head of Sheppard Creek, Rossland Mtn. system, B.C.

82–F–W½ (Anal. M.F. Connor) Ser. No. *1912–57*

An alkaline biotite granite of eugranitic structure. A pinkish, medium- to fine-grained aplitic aggregate of quartz, microperthite, orthoclase and oligoclase, and a very minor generally chloritized biotite. A small amount of magnetite and well-crystallized titanite with a few minute zircons are always present.

R.A. Daly (1912, p. 355)

8. BIOTITE GRANODIORITE (GRANODIORITE). Lacorne massif; Fiedmont tp., rge. 7, middle lot 45, Abitibi co., Que.

32–C–W½ (Anal. J. Hitchins) Ser. No. *1955–39*

Fine-grained, buff coloured, massive rock with over 10% visible glassy to yellow quartz, and mafics in fine-grained black aggregates. Plagioclase shows mortar structure, has been clouded by sericite and clino-

	6	7	8	9	10
SiO_2	77.74	77.09	76.99	76.47	75.95
Al_2O_3	13.26	13.04	11.59	12.64	11.71
Fe_2O_3	0.30	0.82	1.31	0.11	1.83
FeO	0.28	0.26	2.05	1.49	1.35
MgO	0.18	0.12	0.25	0.22	0.24
CaO	1.08	0.63	1.51	0.90	0.24
Na_2O	5.82	3.11	4.00	3.61	3.73
K_2O	0.81	4.50	1.05	3.71	4.36
H_2O+	} 0.32	0.07	0.61	0.28	0.17
H_2O-		0.03	0.01	0.03	0.07
TiO_2	0.07	0.05	0.26	0.16	0.20
P_2O_5		0.10	0.05	0.15	0.02
MnO			0.03	0.03	0.06
CO_2	0.05		nil	0.12	nil
Total	99.91	99.82	99.71	99.92	99.93
Sp. gr.		2.600	2.69		

NORMS

	6	7	8	9	10
QTZ	35.50	38.25	43.22	36.20	34.42
CO	.91	2.36	1.37	1.54	.50
OR	4.80	27.09	6.40	22.35	26.29
AB	52.35	28.39	36.99	32.97	34.10
AN	5.37	2.51	7.39	3.55	1.08
LC	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	–	.21	.10	.31	.04
RU	–	–	–	–	–
IL	.09	.07	.37	.22	.28
PY	–	–	–	–	–
HE	–	.24	–	–	–
MT	.31	.50	1.40	.11	1.94
EN	.50	.33	.71	.62	.68
FS	.12	–	2.00	2.08	.64
OL	–	–	–	–	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	–	–	–
WO	–	–	–	–	–

zoisite and is well twinned. Quartz is unaltered and interstitial. Chlorite has replaced the biotite. Accessory quantities of microcline, sphene, clinozoisite, and magnetite have been observed. (M)

(K.R. Dawson)

9. GRANITE (QUARTZ MONZONITE). Intrusive in Kisseynew sedimentary gneisses; ½ mi. south of Kississing River, Man.

63–N–W½ (Anal. T. Kameda) Ser. No. *1930–29*

Granitic intrusive rocks in the area are variable within the same body and in different bodies. Pink, pinkish grey, grey and white, massive except where locally gneissic. Some have microcline as the abundant feldspar, others orthoclase; plagioclase may be albite, oligoclase, or a variety intermediate between these. Biotite is the abundant dark mineral.

J.F. Wright (1931, p. 19) *See also* Nos. 22, 30, 34 *(1930–30, 28, 27)*

10. GRANITE. Makkovik, at a point north of Mission, Labrador.

13–O–W½ (Anal. H. Lönnroth) Ser. No. *1953–15*

E.H. Kranck (1953, p. 21)

11. GRANODIORITE. West of Yellowknife greenstone belt, and near the contact zone; Vital Lake area, District of Mackenzie.

85–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1954–16*

Massive, in general homogeneous in texture with local porphyritic varieties. Mineral composition is variable, a typical specimen containing 40% quartz, 45% oligoclase, 10% microcline, and 5% biotite and/or hornblende. Biotite and hornblende are chloritized and the feldspars are mildly sericitized. Accessory minerals include epidote, sphene, apatite, zircon, rarely tourmaline, and small amounts of pyrite and carbonates.

R.W. Boyle (1961, p. 72)

12. SODA GRANITE (GRANODIORITE). Associated with, and presumably a differentiate of, intrusive augite diorite; 602 crosscut, Ida May workings, Bralorne mine, Bridge River District, B.C.

92–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1936–1*

A coarse-grained, highly siliceous intrusive rock, genetically related to gold-bearing quartz veins. Principal constituents are quartz, full of minute gaseous and liquid inclusions, and plagioclase, which is almost pure albite. Small percentage of sericite, a little pyrite, leucoxene, and apatite are present. (M)

C.E. Cairnes (1937, p. 26) *See also* No. 20 *(1934–3)*

	11	12	13	14	15
SiO_2	75.92	75.87	75.34	75.06	75.05
Al_2O_3	13.46	12.42	13.96	14.32	13.39
Fe_2O_3	0.11	0.66	0.30	0.42	0.34
FeO	1.51	2.03	0.86	0.57	0.76
MgO	0.21	0.11	0.06	0.25	0.11
CaO	1.34	1.59	0.80	0.35	0.85
Na_2O	2.14	5.06	4.10	4.62	4.10
K_2O	4.17	0.46	4.03	3.84	4.44
H_2O+	0.69	0.31	0.27	0.44	0.35
H_2O-	0.08	0.10	0.05	0.05	0.06
TiO_2	0.07	0.31	0.05	0.04	0.04
P_2O_5	0.10	0.28	0.04	0.01	0.04
MnO	0.08	nil	0.07	0.07	0.03
CO_2	nil	nil	nil	nil	0.04
S	0.04	0.26			
Total	99.92	99.46	99.93	100.04	99.60
Less O ≡ S	0.02	0.10			
	99.90	99.36			
Sp. gr.			2.63		2.63

NORMS

	11	12	13	14	15
QTZ	41.51	38.70	31.75	29.87	29.93
CO	3.61	1.52	1.71	2.12	.41
OR	25.44	2.77	24.08	22.82	26.62
AB	19.80	46.25	37.14	41.63	37.26
AN	6.18	6.17	3.54	1.68	4.01
LC	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	.21	.59	.14	.02	.08
RU	–	–	–	–	–
IL	.10	.43	.05	.05	.05
PY	.10	.69	–	–	–
HE	–	–	–	–	–
MT	.11	.70	.31	.43	.35
EN	.60	.31	.16	.69	.30
FS	2.28	1.82	1.07	.64	.94
OL	–	–	–	–	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	–	–	–
WO	–	–	–	–	–

13. MUSCOVITE QUARTZ MONZONITE (QUARTZ MONZONITE). Lacorne massif; Lacorne tp., rge. 8, lot 16, north end, Abitibi co., Que.

32–C–W½ (Anal. J.A. Maxwell, M. Staples) Ser. No. *1955–32*

White massive quartz monzonite, with over 10% glassy quartz, green muscovite, and a few small red garnets visible in hand specimen. Plagioclase is well twinned and lightly altered, microcline and quartz are unaltered and interstitial. Muscovite is the principal mafic mineral and is associated with chloritized biotite. Accessory red garnet, hematite, and sphene were observed. (M)

(K.R. Dawson)

14. MUSCOVITE QUARTZ MONZONITE. Preissac massif; Preissac tp., rge. 4, lot 4, Abitibi co., Que.

32–D–E½ (Anal. M. Staples) Ser. No. *1955–49*

White, massive, coarse-grained intrusive rock. Over 10% glassy quartz, pale green mica, lustreless white feldspar visible in hand specimens. Plagioclase, microcline, and quartz are the principal constituents. The plagioclase is twinned, weakly zoned, and tends to be subhedral to euhedral. The microcline is well twinned, anhedral, and is interstitial to the plagioclase. The quartz is glassy and is also interstitial. Muscovite is the principal mafic mineral and it occurs as thin disseminated flakes with a few flakes of biotite. A few grains of clinozoisite were observed.

(K.R. Dawson)

15. MUSCOVITE GRANITE (QUARTZ MONZONITE). Lacorne massif; acidic phase; Lacorne tp., rge. 7, middle of lot 31, Abitibi co., Que.

32–C–W½ (Anal. J.A. Maxwell, M. Staples) Ser. No. *1955–31*

White, fine-grained granite. Plagioclase occurs in subhedral grains with light clouds of sericite. Quartz and microcline are unaltered and they are interstitial. Accessory quantities of epidote, chlorite, sphene, and muscovite are present. (M)

(K.R. Dawson)

16. QUARTZ ALBITITE. Irregular, probably lens-shaped, intrusive mass; in sediments exposed on face of crosscut, south of 380, 375-foot level, Pandora mine, Cadillac tp., Abitibi co., Que.

32–D–E½ (Anal. R.J.C. Fabry) Ser. No. *1936–3*

Light grey to cream coloured rock, of exceedingly fine grain, cut by quartz veins and slightly mineralized with sulphides. Consists of albite

	16	17	18	19	20
SiO_2	74.93	74.89	74.80	74.58	74.36
Al_2O_3	13.72	13.27	12.98	13.69	12.87
Fe_2O_3	1.70	0.36	0.62	0.50	0.61
FeO	0.51	3.65	1.40	0.60	1.96
MgO	0.06	0.40	0.06	0.08	1.27
CaO	0.45	1.15	1.96	1.49	1.12
Na_2O	7.09	4.25	2.85	4.31	5.27
K_2O	0.68	0.37	3.17	4.52	0.36
H_2O+	0.12	1.22	0.79	0.29	1.21
H_2O-	nil	0.03	0.08	0.04	0.10
TiO_2	0.09	0.22	0.36	0.05	0.14
P_2O_5	0.13	trace	0.08	0.02	0.07
MnO	trace	trace	0.09	0.03	trace
CO_2	nil	0.78	0.93	0.08	1.32
S	0.26	trace	0.03		0.61
Total	99.74	100.59	100.20	100.28	101.17 (101.27)
Less O≡S	0.10		0.01		0.22
	99.64		100.19		100.95 (101.05)
Sp.gr.				2.63	

NORMS

	16	17	18	19	20
QTZ	28.05	41.13	39.77	27.22	35.20
CO	.87	4.25	1.66	–	2.13
OR	3.99	2.25	19.46	26.84	2.15
AB	63.18	39.35	26.53	38.81	47.81
AN	1.37	5.89	9.56	4.63	5.16
LC	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	.27	–	.17	.04	.14
RU	–	–	–	–	–
IL	.12	.31	.51	.06	.19
PY	.67	–	.08	–	1.60
HE	.96	–	–	–	–
MT	.31	.38	.67	.52	.64
EN	.16	1.14	.17	.22	3.57
FS	–	5.24	1.37	.55	1.36
OL	–	–	–	–	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	–	–	–
WO	–	–	–	1.06	–

phenocrysts and a few of orthoclase in a groundmass of plagioclase and little quartz. Pyrite, arsenopyrite, and sericite occur as accessories. Talc and vein quartz are also present.

H.C. Gunning (1937, p. 22) *See also* Nos. 50, 52, 104 *(1935–29, 28, 26)*

17. **ALASKITE GRANITE.** Powell granite; on the south edge of a high east-west trending ridge, about 1,100 feet east of the Rouyn-Beauchastel line and 2,000 feet north of the Rouyn-Noranda branch of the T. and N.O. railway, Rouyn tp., Timiskaming co., Que.

32–D–W½ (Anal.R.J.C. Fabry) Ser. No. *1936–11*

A moderately coarse, somewhat variegated rock consisting of abundant plagioclase having the optical properties of albite, quartz in numerous irregular grains, green chlorite either within the feldspar or along the contact of the feldspar grains, some carbonate in areas within the plagioclase, and a few aggregates of epidote included in the chlorite.

(M.E. Wilson)

18. **GRANODIORITE.** Granitized zone, Ryan Lake, Yellowknife, District of Mackenzie.

85–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1954–12*

Grey granodiorite taken from clearly granitized zone. Sharp contacts are rare, and ghosts and inclusions of amphibolite abound in the granitic rocks.

R.W. Boyle (1961, p. 72)

19. **ALASKITIC GRANITE (QUARTZ MONZONITE).** Preissac massif; north end of La Motte tp., rge. 2, lot 4, Abitibi co., Que.

32–D–E½ (Anal. J. Hitchins) Ser. No. *1955–47*

Pink, fine-grained granite. Plagioclase is present as subhedral, lightly altered grains. Microcline and quartz are unaltered and interstitial. Accessory quantities of muscovite, chlorite, hematite, and clinozoisite are present. (M)

(K.R. Dawson)

20. **QUARTZ ALBITITE (GRANODIORITE).** Differentiate of the Bendor diorite and genetically associated with the gold-bearing quartz veins, cutting diorite, serpentine, and sediments; Pioneer mine workings, Bridge River, Lillooet district, B.C.

92–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1934–3*

Medium-grained, somewhat fractured, quartzose, light coloured rock composed mostly of quartz and albite, with veins of calcite and considerable chloritic material. No orthoclase was identified. The quartz

	21	22	23	24	25
SiO_2	74.28	74.14	73.99	73.87	73.16
Al_2O_3	14.38	14.76	13.62	12.54	12.78
Fe_2O_3	0.32	0.81	0.70	1.07	1.43
FeO	0.77	0.66	0.84	1.73	1.20
MgO	0.16	0.39	0.51	0.68	0.55
CaO	0.60	0.66	0.48	0.50	2.00
Na_2O	4.18	3.00	2.70	2.94	3.84
K_2O	4.15	5.40	5.87	5.38	3.08
H_2O+	0.42	0.20	0.54	0.59	0.87
H_2O-	0.01	0.10	0.11	0.07	0.06
TiO_2	0.07		0.13	0.46	0.30
P_2O_5	0.11		0.04	0.20	0.15
MnO	0.04		0.01		trace
CO_2	0.18		0.07	0.10	
S	trace				
Cl	0.02				
Cr_2O_3	nil				
Total	99.69	100.12	99.61	100.13	99.42
Sp.gr.	2.605				

NORMS

	21	22	23	24	25
QTZ	30.41	31.68	32.07	32.20	32.62
CO	2.39	3.04	2.26	1.59	–
OR	24.86	32.31	35.55	32.55	18.73
AB	37.97	27.22	24.79	26.96	35.40
AN	2.28	3.31	2.17	1.20	8.74
LA	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	.23	–	.08	.42	.32
RU	–	–	–	–	–
IL	.09	–	.18	.65	.42
PY	–	–	–	–	–
HE	–	–	–	–	–
MT	.33	.85	.74	1.14	1.53
EN	.45	1.09	1.45	1.93	1.57
FS	.94	.46	.66	1.31	.45
OL	–	–	–	–	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	–	–	–
WO	–	–	–	–	.18

is filled with minute inclusions of gas and liquid. Some pyrite, associated in places with a curious alteration product like leucoxene, is present.

C.E. Cairnes (1937, p. 26) *See also* No. 68 *(1934–2)*

21. **GRANITE (QUARTZ MONZONITE).** Prosperous Lake, Yellowknife, District of Mackenzie.

85–J–E½ (Anal. J.A. Maxwell) Ser. No. *1955–11*

Prosperous Lake granite is relatively inhomogeneous, containing many tourmaline-bearing pegmatites with some aplites. Specimens contain 30–35% quartz, 25–30% microcline, 20–25% oligoclase, 5–10% muscovite and 5–10% biotite. Accessory minerals include garnet, apatite, zircon, tourmaline, and very minor amounts of pyrite.

R.W. Boyle (1961, p. 71)

22. **GRANITE.** Intrusive in Kisseynew sedimentary gneisses, southwest of Kississing Lake, Man.

63–N–W½ (Anal. R.B. Ellestad) Ser. No. *1930–30*

Variable in mineral content within the same body and in different bodies. Consists of microcline and perthite, oligoclase-albite, quartz, biotite, garnet, and accessory zircon and pyrite, and secondary sericite, chlorite, and hematite. (M)

J.F. Wright (1931, p. 19) *See also* Nos. 9, 30, 34 *(1930–29, 28, 27)*

23. **MICROCLINE GRANITE (QUARTZ MONZONITE).** Dyke intrusive into granodiorite and biotite granite; east shore of the unnamed lake west of Runa Lake, south of Thubun Lake, O'Connor Lake area, District of Mackenzie.

75–E–W½ (Anal. J.A. Maxwell) Ser. No. *1955–4*

Equigranular, massive, medium-grained, fresh-appearing rock consisting of phenocrysts of altered oligoclase and fresh microcline with interstitial quartz. Microcline often seems to replace the plagioclase. Perthitic structures are common. Biotite and apatite are the only accessory minerals with minor zircon. Chlorite and sericite are present as alteration products. (M)

B.D. Prusti (1954) *See also* Nos. 4, 369, 361 *(1955–2, 1954–38, –42)*

24. **GRANODIORITE (GRANODIORITE).** South end of Bekanon intrusion on Key Inlet, about 4 miles west of Ludgate station, Georgian Bay, Sudbury district, Ont.

41–H–E½ (Anal. T. Kameda) Ser. No. *1931–33*

Highly streaked and gneissic. (M)

(T.T. Quirke)

	26	27	28	29	30
SiO_2	73.12	73.09	72.96	72.95	72.87
Al_2O_3	14.35	14.01	17.30	14.11	13.58
Fe_2O_3	1.41	0.32		0.37	0.41
FeO	0.80	0.89		1.89	1.38
MgO	0.40	0.37	0.65	0.56	0.67
CaO	0.28	2.05	1.50	1.46	3.32
Na_2O	4.60	4.15		4.29	2.81
K_2O	4.31	1.63	6.41	2.80	3.58
H_2O+	1.11	0.72		0.69	0.36
H_2O-	0.09	0.05	1.10	0.06	0.04
TiO_2	0.13	0.20		0.19	0.26
P_2O_5	0.06	0.05		0.06	0.33
MnO	0.04	0.02		0.06	0.04
CO_2		1.80		0.14	0.47
S		0.80		0.02	
Cl		nil		0.02	
Cr_2O_3		0.04		0.01	
iron			0.10		
Total	100.70	100.19	100.02	99.68	100.12
Less O≡S,Cl		0.34		0.01	
		99.85		99.67	
Sp.gr.	2.41			2.66	

NORMS

	26	27	28	29	30
QTZ	26.86	36.07	42.48	30.37	33.14
CO	1.90	2.05	8.60	1.67	–
OR	25.65	9.89	39.31	16.86	21.68
AB	41.52	38.18	–	39.17	25.80
AN	1.00	10.10	7.72	6.98	14.15
LC	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	.12	.10	–	.12	.70
RU	–	.13	–	–	–
IL	.18	.01	–	.26	.37
PY	–	2.13	–	.05	–
HE	–	.22	–	–	–
MT	1.47	–	–	.39	.43
EN	1.11	1.05	1.87	1.58	1.90
FS	.13	–	–	2.50	1.58
OL	–	–	–	–	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	–	–	–
WO	–	–	–	–	.20

25. **GRANITE.** Collins Gulch, Tulameen district, Yale, B.C.

92–H–E½ (Anal. M.F. Connor) Ser. No. *1913–16*

Coarse, even-grained, granitic textured rock, often traversed by small quartz veinlets. Along fracture planes there is a development of chlorite, epidote, and other secondary minerals. The predominant constituents are quartz and orthoclase. The quartz is clear and glassy, and occurs in large individuals or aggregates of small grains with fractures filled with secondary calcite or quartz. Orthoclase occurs in large crystals, which are cloudy and decompose to flakes of mica and grains of epidote. A little plagioclase occurs in small individual crystals. Hornblende altered to green pleochroic chlorite, epidote, and rarely, biotite altered to chlorite are also present. Accessory constituents include apatite, titanite, magnetite, pyrite, and calcite.

C. Camsell (1913, p. 46)

26. **GRANITE PORPHYRY.** Dyke of the Klusha intrusive rocks; south side of Graham Inlet, Taku Arm, Atlin district, B.C.

104–N–W½ (Anal. Mines Branch) Ser. No. *1913–38*

Greyish, coarsely-granular rock, with a holocrystalline, porphyritic structure and plentiful alkali feldspar and lime alkali feldspar phenocrysts in a microgranitic quartz feldspar groundmass containing biotite and hornblende. Orthoclase and microcline occur in equal amounts, slightly altered to muscovite, and occasionally kaolin, with minor amounts of acid plagioclase in phenocrysts, much altered to epidote, calcite, quartz, and muscovite. Apatite and zircon are accessory.

D.D. Cairnes (1913, p. 68)

27. **QUARTZ FELDSPAR PORPHYRY.** C–906 drift, Con mine, Yellowknife, District of Mackenzie.

85–J–E½ (Anal. J.A. Maxwell) Ser. No. *1955–6*

Forms dykes and irregular masses with many ramifying tentacles, mainly in the greenstones, but a few cut the Yellowknife sediments. Most dykes have a porphyritic texture, and the minerals are altered as a result of regional metamorphism. They contain essentially quartz and zoned plagioclase phenocrysts in a groundmass of fine-grained plagioclase, quartz, microcline, muscovite, carbonates, and chloritized biotite. The cores of the plagioclase phenocrysts are generally altered to sericite and carbonate. Pyrite and pyrrhotite, which are abundant, appear to be primary constituents. They fill interstices between the quartz and feldspar, and form along cleavage planes of biotite. Accessory minerals include apatite, zircon, rutile, and epidote.

R.W. Boyle (1961, p. 71)

28. **GRANITE.** East border of fracture zone; Amherst tp., rge. 6, lot 5, Labelle co., Que.

31–G–E½ (Anal. A.G. Spencer) Ser. No. *1919–19*

Altered granite, consisting of numerous grains of quartz and scattered flakes of muscovite embedded in andesine feldspar, in which a kaolinized feldspar, presumably orthoclase, was perthitically included. Undulatory extinction of the quartz, and broken and bent condition of the feldspar indicate considerable deformation. Both the quartz and feldspar contain numerous hair-like inclusions of a mineral, probably rutile.

M.E. Wilson (1919, p. 24)

29. **GRANODIORITE.** Body west of Yellowknife greenstone belt; Yellowknife, District of Mackenzie.

85–J–E½ (Anal. J.A. Maxwell) Ser. No. *1955–10*

The western granite is massive and generally homogeneous in texture. Locally porphyritic varieties are present. The mineral composition is variable. Towards the centre of the granite mass, the amount of quartz and potassic feldspar increases and sodic feldspar, biotite, and hornblende decrease. In all phases the biotite and hornblende are chloritized and the feldspars mildly sericitized. Accessory minerals include epidote, sphene, apatite, zircon, rarely tourmaline, and small amounts of pyrite and carbonate.

R.W. Boyle (1961, p. 71)

30. **GRANITE.** Sill-like body intrusive in Kisseynew sedimentary gneisses; west end of the Sherritt-Gordon deposit west of the north end of Camp Lake, Man.

63–N–W½ (Anal. T. Kameda) Ser. No. *1930–28*

Variable in mineral content within the same body and in different bodies. Some have microcline as the abundant feldspar, others orthoclase. Plagioclase may be albite, oligoclase, or a variety intermediate between these. Biotite is the abundant dark mineral. Some bodies have both hornblende and biotite.

J.F. Wright (1931, p. 19) *See also* Nos. 9, 22, 34 *(1930–29, 30, 27)*

31. **QUARTZ MONZONITE (QUARTZ MONZONITE).** La Motte massif; Preissac tp., rge. 10, lot 45, Abitibi co., Que.

32–D–E½ (Anal. M. Staples) Ser. No. *1955–36*

Pink, coarse-grained, lightly foliated quartz monzonite consisting of subhedral, lightly clouded plagioclase, unaltered, interstitial microcline, clear, interstitial quartz, chlorite replacing primary biotite, scattered flakes of unaltered muscovite, and accessory apatite, clinozoisite, and red garnets. (M)

(K.R. Dawson)

	31	32	33	34	35
SiO_2	72.79	72.51	72.38	72.34	72.32
Al_2O_3	14.62	15.27	14.69	13.91	14.53
Fe_2O_3	0.14	0.39	0.27	0.58	0.67
FeO	1.39	0.95	1.61	1.97	1.37
MgO	0.33	0.17	0.07	0.67	0.58
CaO	1.16	1.05	1.06	1.51	1.52
Na_2O	4.19	4.03	3.80	3.61	4.46
K_2O	4.45	5.14	4.68	4.11	3.51
H_2O+	0.26	0.29	0.47	0.41	0.67
H_2O-	0.08	0.07	0.37	0.03	0.06
TiO_2	0.12	0.08	0.11	0.33	0.30
P_2O_5	0.11	0.04	0.17	0.34	0.17
MnO	0.05	0.04	0.23	0.05	0.02
CO_2		0.06	nil	0.10	
S			0.05		
Total	99.69	100.09	99.96	99.96	100.18
Less O ≡ S			0.02		
			99.94		
Sp. gr.		2.62			

NORMS

	31	32	33	34	35
QTZ	25.80	24.58	27.46	29.31	26.76
CO	1.15	1.36	2.03	1.74	1.12
OR	26.56	30.53	28.10	24.69	20.92
AB	37.92	36.30	34.59	32.89	40.31
AN	5.08	4.97	4.21	5.35	6.48
LC	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	.23	.08	.36	.72	.35
RU	–	–	–	–	–
IL	.16	.11	.15	.46	.42
PY	–	–	.13	–	–
HE	–	–	–	–	–
MT	.14	.40	.28	.61	.70
EN	.92	.47	.19	1.89	1.62
FS	1.97	1.15	2.45	2.29	1.27
OL	–	–	–	–	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	–	–	–
WO	–	–	–	–	–

32. **QUARTZ MONZONITE (QUARTZ MONZONITE).** La Motte massif; Preissac tp., rge. 9, south end of lot 57, Abitibi co., Que.

32–D–E½ (Anal. M. Staples) Ser. No. *1955–35*

Massive white feldspar, more than 10% quartz, a few small red garnets, biotite and muscovite are visible in hand specimen. The plagioclase is heavily clouded by sericite and clinozoisite, and contains vermicular quartz. Microcline and quartz are unaltered and interstitial. Dark green biotite is partly altered to chlorite. Accessory quantities of goethite, sphene, and muscovite are present. (M)

(K.R. Dawson)

33. **GRANITE (QUARTZ MONZONITE).** Prosperous Lake granite; Prosperous Lake, Yellowknife, District of Mackenzie.

85–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1954–15*

Relatively inhomogeneous granite containing many tourmaline-bearing pegmatites with some aplites. Specimens contain 30–35% quartz, 25–30% microcline, 20–25% oligoclase, 5–10% muscovite, and 5–10% biotite. Accessory minerals include garnet, apatite, zircon, tourmaline, and very minor amounts of pyrite.

(R.W. Boyle)

34. **GRANITE (QUARTZ MONZONITE).** Kaminis granite; 1 mile southeast of Weldon Bay, east end of Kisseynew Lake, Man.

63–K–W½ (Anal. T. Kameda) Ser. No. *1930–27*

Variable in mineral content, containing quartz, oligoclase, microcline, orthoclase, perthite, biotite, and small amounts of hornblende, apatite, and leucoxene.

J.F. Wright (1931, p. 19) *See also* Nos. 9, 22, 30 *(1930–29, 30, 28)*

35. **GRANITE.** East side of the north end of Otter Lake, Tulameen district, B.C.

92–H–E½ (Anal. M.F. Connor) Ser. No. *1913–17*

The Otter granite is a pink, medium-grained rock of granitic texture with a tendency to develop a porphyritic structure in which the phenocrysts are large white feldspars in a pink groundmass. Clear glassy quartz is intergrown with turbid feldspar in a micrographic structure. The feldspars are altered, the plagioclase being fresher in appearance than the orthoclase. Biotite occurs sparingly in small pleochroic shreds. A little accessory magnetite, apatite, and hornblende are present.

C. Camsell (1913, p. 101)

36. **FELDSPAR PORPHYRY.** Grenville, Argenteuil co., Que.

31–G–E½ (Anal. T.S. Hunt) Ser. No. *1858–9*

Greenish black, jasper-like rock with a base consisting of an intimate mixture of orthoclase and quartz. Disseminated throughout are phenocrysts of rose-red or flesh-red feldspar and nearly colourless translucent quartz. Base, freed from feldspar and quartz, was analyzed.

T.S. Hunt (1859, p. 189)

37. **BIOTITE GRANODIORITE (GRANODIORITE).** Kapitagama satellite; lot on the shore of Kewagama Lake, Preissac tp., rge. 5, Abitibi co., Que.

32–D–E½ (Anal. M. Staples) Ser. No. *1955–37*

Grey, fine-grained biotitic intrusive rock, with weak foliation. Plagioclase is present in subhedral grains, weakly altered to sericite, and is undeformed. Quartz is clear, interstitial, and shows undulatory extinction. Microcline is unaltered, interstitial, and occurs in anhedral grains. Small flakes of brown biotite are disseminated through the rock partly replaced by chlorite. Accessory quantities of sphene, leucoxene, epidote, hematite, and apatite are present. (M)

(K.R. Dawson)

38. **GRANITE.** Near Kettle Valley railway siding at Portia, Coquihalla River, Yale district, B.C.

92–H–W½ (Anal. M.F. Connor) Ser. No. *1924–6*

Grey, moderately coarse-grained, massive rock with granitic texture. Large, irregular crystals or crystal aggregates of white plagioclase, ¼ inch in diameter, give it a spotty appearance. It is the most abundant constituent and some crystals are poorly zoned. Quartz is abundant as glassy granular aggregates or crystals, and is intergrown with feldspar interstitially. Biotite is the principal mafic mineral. Green hornblende occurs in larger crystals than biotite. Brown sphene is plentiful. Magnetite and apatite are accessory.

C.E. Cairnes (1924, p. 100)

39. **BIOTITE GRANODIORITE (GRANODIORITE).** La Motte massif; La Motte tp., rge. 10, lot 43, east end, Abitibi co., Que.

32–D–E½ (Anal. J. Hitchins) Ser. No. *1955–44*

Fine-grained, massive, grey granodiorite, with visible microscopic flakes of biotite, and quartz. Plagioclase is lightly altered, well-twinned, tends to be subhedral, and shows a few poorly zoned crystals. Microcline is unaltered and interstitial. Quartz is glassy and interstitial. Unaltered dark green biotite flakes are common. Accessory clinozoisite, apatite, and sphene have been observed. (M)

(K.R. Dawson)

	36	37	38	39	40
SiO_2	72.20	72.10	71.90	71.45	71.45
Al_2O_3	12.50	15.81	14.21	15.75	12.17
Fe_2O_3		0.34	0.33	0.54	1.03
FeO	3.70	0.99	0.86	0.75	4.18
MgO		0.40	0.30	0.42	0.94
CaO	0.90	2.34	1.70	2.95	1.35
Na_2O	5.30	6.03	4.07	5.60	3.06
K_2O	3.88	1.27	4.24	2.18	3.49
H_2O+		0.22	0.70	0.24	1.06
H_2O-		0.10	0.15	0.04	0.07
TiO_2		0.15	0.30	0.22	0.79
P_2O_5		0.09	0.05	0.11	0.66
MnO		0.02	0.02	0.01	0.13
CO_2		0.09	0.23	nil	nil
S					0.08
F			trace		
BaO					0.11
FeS_2			0.15		
volatile	0.60				
Total	99.08	99.95	99.21	100.26	100.57
Less O≡ S,F					0.06
					100.51
Sp.gr.	2.62			2.65	2.697

NORMS

	36	37	38	39	40
QTZ	22.40	24.22	26.36	22.29	33.31
CO	–	.50	–	–	2.64
OR	23.32	7.47	25.60	12.80	21.92
AB	45.93	53.84	37.25	49.86	28.25
AN	–	10.97	8.10	11.28	2.45
LC	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	–	.18	.10	.22	1.42
RU	–	–	–	–	–
IL	–	.20	.42	.30	1.13
PY	–	–	.39	–	.21
HE	–	–	–	–	–
MT	–	.35	.35	.55	1.10
EN	–	1.10	.85	1.15	2.69
FS	5.80	1.11	.46	.48	4.84
OL	–	–	–	–	–
AC	–	–	–	–	–
NSI	.71	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	–	–	–
WO	1.81	–	.07	1.01	–

40. **MICROPEGMATITE.** Narrow part of the micropegmatite offset 70 chains north from junction of the Hanmer and Massey Bay roads, Garson tp., Sudbury district, Ont.

41–I–E½ (Anal. R.J.C. Fabry) Ser. No. *1933–7*

A very fine grained, dark grey rock, considerably sheared. Consists of the usual micropegmatite association, viz., plagioclase, micrographic intergrowth of quartz and feldspar, dark minerals, and black iron ore. The dark minerals are completely decomposed to chlorite and epidote. The black iron ore is nearly all changed to leucoxene. (M)

(W.H. Collins and E.D. Kindle)

41. **ALBITE GRANITE (GRANODIORITE).** Footage 50–85 feet, diamond drill hole "A", drilled 1934 by Ascat, Malartic tp., rge. 2, lot 13, Abitibi co., Que.

32–D–E½ (Anal. R.J.C. Fabry) Ser. No. *1936–12*

Medium to coarse-grained, equigranular holocrystalline rock, light grey. Composed of albite crystals twinned and flecked with sericitic mica; quartz, cracked, interstitial to plagioclase feldspar; biotite, tending to a nested arrangement, nests in part interstitial to, and in part enclosed in, plagioclase feldspar crystals; accessory apatite and titanite, and some secondary chlorite, carbonate, and a few grains of pyrite. (M)

H.C. Gunning and J.W. Ambrose (1940, p. 30)

42. **BIOTITE GRANITE (QUARTZ MONZONITE).** Sumas Mtn., Skagit Range, north of Huntingdon railway, Yale district, B.C.

92–G–E½ (Anal. M. Dittrich) Ser. No. *1912–80*

Light pinkish grey, fine- to medium-grained rock, poor in dark constituents, with the composition and structure characteristic of mica granites. Quartz, orthoclase (in places slightly microperthitic), basic andesine and biotite are the essential constituents. Pale green hornblende, magnetite, apatite, titanite, and rare zircons are accessory. The rock is considerably altered. Feldspar is often much kaolinized and the biotite is generally chloritized to some extent. The rock is nowhere crushed.

R.A. Daly (1912, p. 527)

43. **BIOTITE GRANITE (QUARTZ MONZONITE).** Older phase of the Cathedral batholith; on the Boundary Commission trail near the top of Bauerman ridge, Okanagan Range, Similkameen district, B.C.

92–H–E½ (Anal. M.F. Connor) Ser. No. *1912–78*

Coarse-grained, light pinkish grey biotite granite, singularly homogeneous mineralogically and texturally. The essential minerals are microperthite, quartz, oligoclase, orthoclase (often microcline), and biotite; the accessories are apatite and magnetite with rather rare titanite and zircon. In

	41	42	43	44	45
SiO_2	71.36	71.24	71.21	71.08	71.01
Al_2O_3	15.52	14.11	15.38	13.56	12.56
Fe_2O_3	0.70	1.75	0.25	1.31	1.54
FeO	1.19	1.23	1.47	2.31	3.38
MgO	1.08	1.07	0.33	0.79	0.68
CaO	1.31	2.87	1.37	1.42	3.64
Na_2O	6.20	2.37	4.28	3.58	3.47
K_2O	0.71	3.97	4.85	4.51	0.99
H_2O+	0.51	0.59	0.43	0.41	0.80
H_2O-	0.04	0.11	0.02	0.04	0.14
TiO_2	0.31	0.42	0.16	0.58	0.40
P_2O_5	0.22	0.17	0.05	0.28	0.16
MnO	nil	trace	0.06		nil
CO_2	0.66	0.28		0.33	0.57
S	0.17				0.33
Cl					nil
BaO		0.09	0.09		trace
Fe	0.15				
Total	100.13	100.27	99.95	100.20	99.67
Less O − S					0.12
					99.55
Sp.gr.		2.651	2.621		

NORMS.

	41	42	43	44	45
QTZ		33.07	21.62	26.96	36.01
CO		1.02	.58	.95	—
OR		24.11	28.80	27.15	6.09
AB		21.82	38.54	32.68	32.37
AN		13.95	6.94	5.31	16.38
LC		—	—	—	—
NE		—	—	—	—
KP		—	—	—	—
AP		.36	.10	.59	.34
RU		—	—	—	—
IL		.59	.22	.82	.57
PY		—	—	—	.89
HE		—	—	—	—
MT		1.87	.26	1.39	1.67
EN		3.05	.92	2.23	1.96
FS		.10	1.97	1.88	3.14
OL		—	—	—	—
AC		—	—	—	—
NSI		—	—	—	—
KSI		—	—	—	—
DI		—	—	—	—
WO		—	—	—	.53

places, especially along contact walls, the rock is porphyritic, with the microperthite developed in large idiomorphic and poikilitic phenocrysts. (M)

R.A. Daly (1912, p. 460)

44. **GRANODIORITE.** South end of the Bekanon intrusive body; on Key Inlet about 16,000 feet west of Ludgate stn., Parry Sound district, Ont.

41–H–E½ (Anal. T. Kameda) Ser. No. *1931–30*

Highly streaked and gneissic. (M)

(T.T. Quirke)

45. **GRANODIORITE.** Footage 35–37, diamond drill hole No. 3, McKay (Quebec) Exploration Co., Deschene Island, Abitibi territory, Que.

32–G–W½ (Anal. R.J.C. Fabry) Ser. No. *1938–6*

Light grey speckled with green spots on fracture. Some biotite is visible Quartz forms 10–20%, and femic minerals 10%.

(G.W.H. Norman)

46. **GRANITE (QUARTZ MONZONITE).** Rykert batholith; on the Boundary Creek wagon road, about 2 miles from the ferry at the eastern end of the road, Selkirk Mountain system, Kootenay district, B.C.

82–F–E½ (Anal. M.F. Connor) Ser. No. *1912–43*

Very coarse-grained, light grey to light pinkish grey, with unusually perfect gneissic structure. Conspicuous phenocrysts of alkaline feldspar and a few of acid oligoclase are embedded in groundmass of quartz, microcline, orthoclase, oligoclase, muscovite, and biotite. Accessories are apatite, magnetite, and titanite. A trace of secondary calcite was noticed. (M)

R.A. Daly (1912, p. 287)

47. **GRANITE (GRANODIORITE).** Dykes and stocks intrusive in Saguenay anorthosites, Laurentian gneiss, and Grenville limestone; from a quarry, Roberval tp., Lake St. John district, Que.

32–A–E½ (Anal. M.F. Connor) Ser. No. *1916–16*

Pinkish or flesh-coloured granite of coarse texture. Feldspar is the most conspicuous constituent, and is microcline with a little oligoclase and occasionally a crystal of labradorite. Quartz is variable in amount, and is next to feldspar in abundance in sections considered typical of the larger masses. Biotite and hornblende are also essential. Pyrite, magnetite, sphene, and apatite are accessory. Usually massive, with gneissosity locally developed due to dynamic metamorphism; where well developed, the coarse feldspars give an augen gneiss

J.A. Dresser (1916, p. 26)

	46	47	48	49	50
SiO_2	70.78	70.67	70.49	70.48	70.36
Al_2O_3............	15.72	14.87	17.47	15.82	15.66
Fe_2O_3	0.36	0.84	1.14	1.55	0.84
FeO	1.61	1.62		1.07	0.71
MgO	0.46	0.20	0.57	0.09	0.64
CaO	1.92	1.72	1.71	0.30	2.64
Na_2O............	3.48	3.64	4.13	3.50	5.45
K_2O	5.23	6.05	4.18	5.70	2.24
H_2O+	0.25	0.20	0.19	0.60	0.60
H_2O-	0.10		0.15	nil	0.01
TiO_2.............	0.20	0.35		0.35	0.45
P_2O_5	0.26			0.09	0.25
MnO	0.03		trace	0.04	trace
CO_2					0.89
S................				0.02	0.10
SrO	trace				
BaO	0.01			0.10	
ZrO_2				0.13	
rare earths				0.36	
Total	100.41	99.65	100.03	100.22 (100.20)	100.84
Less O≡S		(100.16)			0.04
					100.80
Sp.gr.	2.654				

NORMS

	46	47	48	49	50
QTZ	23.61	20.58	24.07	25.96	22.44
CO.	1.56	–	3.29	3.72	.05
OR..............	31.06	35.98	24.72	34.23	13.24
AB..............	31.34	32.82	37.03	31.87	48.86
AN..............	7.91	6.34	8.48	1.41	11.46
LC..............	–	–	–	–	–
NE..............	–	–	–	–	–
KP..............	–	–	–	–	–
AP..............	.54	–	–	.19	.52
RU..............	–	–	–	–	–
IL..............	.27	.48	–	.67	.62
PY..............	–	–	–	.05	.26
HE..............	–	–	.79	.06	.28
MT..............	.37	.88	–	1.54	.44
EN..............	1.28	.55	1.58	.25	1.77
FS..............	2.01	1.43	–	–	–
OL..............	–	–	–	–	–
AC..............	–	–	–	–	–
NSI.............	–	–	–	–	–
KSI.............	–	–	–	–	–
DI..............	–	–	–	–	–
WO..............	–	.89	–	–	–

48. **GRANITE.** Average sample prepared from equal weights of each of seven specimens from the east side of Ship Harbour, Beaver Dam Lake, Sheet Harbour Rd., and a mile north of the Waverley gold mine, Halifax co., N.S.

11–D–W½ (Anal. F.G. Wait) Ser. No. *1892–11*

G.C. Hoffmann (1895, p. 32)

49. **ALASKITE GRANITE.** Killarney granite, in definite and abrupt contact with Huronian rocks; collected across an exposed width of about a mile along the railway, a mile east of Ess Creek station, Davis tp., Sudbury district, Ont.

41–H–W½ (Anal. F.F. Grout) Ser. No. *1931–31*

(T.T. Quirke)

50. **QUARTZ ALBITITE.** Drill core from west side of claim 16018, Cadillac tp., Abitibi co., Que.

32–D–E½ (Anal. R.J.C. Fabry) Ser. No. *1935–29*

Exceedingly fine-grained, light grey to cream coloured rock, generally veined by quartz. Slightly sericitized and mineralized with sulphide and tourmaline. Phenocrysts of albite and a few of quartz lie in a matrix of feldspar and quartz. Contains minor amounts of calcite, sericite, chlorite, and apatite.

H.C. Gunning (1937, p. 22) *See also* No. 52*(1935–28)*

51. **QUARTZ MONZONITE.** Batholith; ¼ mile southeast of the Beaverdell post office, Westkettle River valley, Similkameen district, B.C.

82–E–W½ (Anal. M.F. Connor) Ser. No. *1915–74*

Granitoid, porphyritic, wholly crystalline rock with phenocrysts of pink soda orthoclase from ½ inch to 3 and 4 inches long, very clean-cut in outline, and nearly always twinned according to the Carlsbad law. The phenocrysts are microperthitic intergrowths of anorthoclase or soda orthoclase and albite in the proportions of 5 to 1. (M)

L. Reinecke (1915, p. 49)

52. **ALBITITE.** Altered phase alongside a small auriferous quartz vein; Δ 380 South Crosscut, Pandora mine, Cadillac tp., Abitibi co., Que.

32–D–W½ (Anal. R.J.C. Fabry) Ser. No. *1935–28*

A sericitic and talcose altered phase of the normal albitite cut by quartz stringers and slightly mineralized, and consisting of remnants of plagioclase feldspar in a schistose mixture of quartz and probably talc – perhaps sericite. Contains a few scattered grains of pyrite and arsenopyrite.

H.C. Gunning (1937, p. 37) *See also* No. 16 *(1936–3)*

	51	52	53	54	55
SiO_2	70.20	70.10	70.09	70.00	69.93
Al_2O_3	15.40	20.00	13.58	16.00	15.47
Fe_2O_3	1.00	1.81	1.17	1.28	1.86
FeO	1.02	0.63	3.02	0.51	0.93
MgO	0.60	0.10	1.20	0.50	0.55
CaO	2.00	0.34	1.08	2.30	2.62
Na_2O	4.58	3.62	3.18	5.34	4.52
K_2O	4.67	3.49	4.52	2.99	2.72
H_2O+	)0.30	0.49	0.89	0.52	0.34
H_2O-		0.06	0.11	0.07	0.09
TiO_2	0.25	0.10	0.60	0.20	0.31
P_2O_5		nil	0.26	0.05	0.31
MnO	0.03	trace		0.08	trace
CO_2			0.15		1.05
S		0.47		0.05	0.26
Cl				trace	
SrO				0.01	
BaO				0.04	
Cr_2O_3				nil	
Total	100.05	101.21	99.85	99.94	100.96
Less O ≡ S		0.18		0.02	0.10
		101.03		99.92	100.86

NORMS

	51	52	53	54	55
QTZ	19.18	32.12	27.90	20.38	25.85
CO	–	10.45	2.35	–	1.15
OR	27.60	20.54	27.47	17.67	16.20
AB	41.03	32.30	29.30	47.85	40.82
AN	7.61	1.67	3.76	10.81	11.05
LC	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	–	–	.55	.10	.65
RU	–	–	–	–	–
IL	.34	.13	.85	.27	.43
PY	–	1.21	–	.13	.68
HE	–	1.23	–	.34	.74
MT	1.04	.02	1.25	.82	.83
EN	1.66	.27	3.42	1.38	1.54
FS	.57	–	3.10	–	–
OL	–	–	–	–	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	–	–	–
WO	.92	–	–	.20	–

53. **GRANITE (GRANODIORITE).** North end of Bekanon intrusive body; on the Pickerel River about 2 miles east of the CNR bridge, Parry Sound district, Ont.

41–H–E½ (Anal. T. Kameda) Ser. No. *1931–32*

Massive in structure, with no contact metamorphic zones between the apparent intrusive rock and the country gneisses. (M)

(T.T. Quirke)

54. **SILL ROCK.** Traverses Couchiching mica schists in the vicinity of the Rice Bay granite; south side of Lower Rice Bay, Rainy Lake, Rainy River district, Ont.

52–C–W½ (Anal. M.F. Connor) Ser. No. *1913–46*

Light grey rock with fine-grained granular texture and a pencilled structure. Composed chiefly of alkali feldspar and quartz with a subordinate amount of brown biotite in discrete plates lying in various azimuths. The feldspars are fresh, and both these and the quartz are allotriomorphic. Contains numerous polysomatic quartz lenses, and small nests of molybdenite. Bands of finer grain alternating rudely with bands of coarser grain indicate zones of granulation due to shearing.

A.C. Lawson (1913, p. 59)

55. **ALBITE GRANITE (GRANODIORITE).** Large dyke-like intrusion cutting Keewatin volcanic rocks and bordered by a shear zone; near an old shaft, Valco Mines Ltd., Malartic tp., rge. 5, lot 42, Abitibi co., Que.

32–D–W½ (Anal. R.J.C. Fabry) Ser. No. *1937–2*

Very uniform, brown to grey, holocrystalline intrusion, in part sheared and sericitized, and in large part extensively veined and replaced by quartz. Quartz, albite (An_5), and microcline are the principal constituents. Some of the quartz shows undulatory extinction, the albite is considerably sericitized and the microcline is relatively clear. Accessories are sericitic mica, greenish brown biotite, apatite, carbonate, and pyrite. (M)

H.C. Gunning and J.W. Ambrose (1940, p. 32)

56. **GRANITE (GRANODIORITE).** North end of the Bekanon intrusive body; on Pickerel River, 2 miles east of the CNR bridge, Parry Sound district, Ont.

41–H–E½ (Anal. R.J.C. Fabry) Ser. No. *1930–23*

Pink, massive in structure, with no contact metamorphic zones between the apparent intrusion and the country gneisses. (M)

(T.T. Quirke)

	56	57	58	59	60
SiO_2	69.75	69.74	69.70	69.35	69.16
Al_2O_3	13.57	16.17	16.14	14.38	15.92
Fe_2O_3	0.61	1.40	0.37	1.80	1.54
FeO	4.88	1.90	1.65	3.13	0.92
MgO	0.98	0.83	0.65	0.13	0.33
CaO	1.13	3.38	4.13	1.32	0.64
Na_2O	3.12	3.71	4.97	4.05	5.06
K_2O	5.09	2.42	1.77	5.60	5.97
H_2O+	0.58	0.39	0.53	0.28	0.60
H_2O-		0.11	0.06	trace	
TiO_2	0.54	0.19	0.26	0.29	0.20
P_2O_5	0.18	0.21	0.09	0.04	
MnO	0.02	0.01	0.03	0.02	0.06
CO_2	0.04	0.18	nil	0.05	
S..............	0.13	0.04		0.25	
Cl..............	trace	nil			
BaO	0.05	0.05		0.05	
ZrO_2	trace				
Li_2O	nil				
Cr_2O_3	nil				
Total	100.70 (100.67)	100.73	100.35	100.74	100.40
Less O≡ S	0.05	0.02		0.09	
	100.65 (100.52)	100.71		100.65	
Sp.gr.			2.66		

NORMS

	56	57	58	59	60
QTZ.............	23.81	25.88	22.39	18.87	13.79
CO	1.32	–	–	–	–
OR	30.55	14.29	10.46	33.21	35.08
AB	28.39	33.22	44.56	36.42	45.08
AN	4.75	20.25	16.46	4.48	3.02
LC	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	.38	.43	.18	.08	–
RU	–	–	–	–	–
IL..............	.76	.26	.36	.40	.27
PY	.34	.10	–	.65	–
HE	–	–	–	–	–
MT	.64	1.45	.38	1.88	1.59
EN	2.76	2.30	1.80	.36	.91
FS	6.25	1.64	1.97	2.78	.16
OL	–	–	–	–	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI.............	–	–	–	–	–
DI..............	–	–	–	–	–
WO	–	.13	1.37	.82	.05

57. **GRANITE.** North end of Camp Lake, which joins the southwest arm of Opemisca Lake, Abitibi territory, Que.

32–G–W½ (Anal. R.J.C. Fabry) Ser. No. *1938–11*

(G.W.H. Norman)

58. **BIOTITE GRANODIORITE (GRANODIORITE).** Height of Land Satellite; north end of Preissac tp., rge. 9, lot 5, Abitibi co., Que.

32–D–E½ (Anal. M. Staples) Ser. No. *1955–48*
White, fine-grained, weakly foliated granodiorite. The plagioclase is well zoned and somewhat twinned and lightly altered by clinozoisite and sericite. Microcline and quartz are unaltered and interstitial. Brown biotite, the principal mafic mineral, is present as scattered thin flakes. Accessory sphene, clinozoisite, and zircon are present. (M)

(K.R. Dawson)

59. **ADAMELLITE (MONZONITE).** East side of Dead Island, Georgian Bay, Parry Sound district, Ont.

41–H–E½ (Anal. R.J.C. Fabry) Ser. No. *1930–11*

Massive, or commonly streaked by greater or smaller proportion of hornblende. Consists of large grains varying in size up to 6 mm in diameter of quartz, hornblende, and perthitic orthoclase. The groundmass consists of finer grained colourless material – chiefly nearly equal sized, intimately interlocking quartz, albite, and orthoclase. Unorientated hornblende grains, and minor allanite, zircon, titanite, magnetite, and apatite occur in streaks. The amphibole is very dark coloured and fresh. The colourless minerals are dusted with minute inclusions; orthoclase is veined with incipient alteration. Hematite is collected along cracks between certain grains. (M)

(T.T. Quirke)

60. **QUARTZ MONZONITE (QUARTZ MONZONITE).** Roof of a batholith exposed by erosion; south of the Collier Lakes, West Kettle River, Beaverdell map-area, Similkameen district, B.C.

82–E–E½ (Anal. M.F. Connor) Ser. No. *1915–73*

Pink, fine-grained, holocrystalline, even-grained to porphyritic rock. Composed chiefly of feldspar, which is a perthitic intergrowth of albite and orthoclase in nearly equal proportions.

L. Reinecke (1915, p. 49)

61. **GRANODIORITE.** Extreme southwestern corner of Taku Arm belt, Atlin district, B.C.

104–N–W½ (Anal. Mines Branch) Ser. No. *1913–37*

	61	62	63	64	65
SiO_2	69.08	68.60	68.43	68.30	68.08
Al_2O_3	13.93	13.55	15.80	15.17	13.56
Fe_2O_3	2.72	2.76	1.06	3.90	2.03
FeO	1.62	1.57	1.85	1.92	2.22
MgO	0.80	1.20	1.46	0.40	0.86
CaO	3.38	3.25	4.08	1.56	3.29
Na_2O	3.55	2.52	3.47	5.55	2.12
K_2O	3.99	5.36	2.51	0.14	5.12
H_2O+	1.05	0.49	0.53	0.87	1.88
H_2O-	0.03	0.21	0.05	0.15	0.03
TiO_2	0.23	0.42	0.20	0.42	0.47
P_2O_5	0.07	0.39	0.07	0.08	0.61
MnO	trace	0.08	0.10	nil	0.03
CO_2		nil		1.57	nil
S		0.21		0.08	0.22
SrO			0.02		
BaO			0.09		
Total	100.45	100.61	99.72	100.11	100.52
Less O ≡ S		0.08		0.03	0.08
		100.53		100.08	100.44
Sp.gr.	2.69		2.708		

NORMS

	61	62	63	64	65
QTZ	24.64	25.08	25.10	30.48	27.83
CO	–	–	–	3.64	–
OR	24.05	32.26	15.07	.85	31.37
AB	32.44	23.00	31.60	51.44	19.69
AN	10.44	9.95	20.39	7.46	12.75
LC	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	.14	.82	.14	.17	1.32
RU	–	–	–	–	–
IL	.32	.59	.28	.60	.67
PY	–	.55	–	.21	.59
HE	–	.32	–	.48	–
MT	2.89	2.44	1.12	3.47	2.19
EN	2.26	3.39	4.12	1.14	2.47
FS	.29	–	2.03	–	1.06
OL	–	–	–	–	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	–	–	–
WO	2.47	1.54	.10	–	.01

Greyish to pinkish rock, medium to coarsely textured, and mostly fresh and unaltered. Consists chiefly of alkali feldspar, an acid lime-alkali feldspar, quartz, hornblende, biotite, and augite. Feldspars are zoned. Hornblende and augite are in places intimately intergrown, and the biotite commonly occurs as large fresh individuals. These are all allotriomorphic. Accessory minerals are zircon, apatite, and magnetite. The structure is typically granitic, or porphyritic with feldspar phenocrysts in a granitic groundmass.

D.D. Cairnes (1913, p. 58)

62. **GRANITE.** Road-cut on highway 11, starting 4,000 feet south of the extremity of the creek to Leroche Lake on the north side of the highway and continuing for 7,500 feet, Sisk tp., Nipissing district, Ont.

31–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1952–14*

Coarse-grained, pink augen granite.

(W.G. Johnston)

63. **GRANODIORITE (QUARTZ DIORITE).** Osoyoos batholith; 2 miles north of the International Boundary and about 2 miles from the eastern contact in the vicinity of Osoyoos Lake, Okanagan River Valley, Similkameen district, B.C.

82–E–W½ (Anal. M.F. Connor) Ser. No. *1912–69*

Rather coarse-grained and gneissic rock that has been altered through dynamic metamorphism. The essential constituents are deep green hornblende, brownish green biotite, orthoclase, quartz, and unzoned andesine. Accessory minerals are apatite, zircon, magnetite, and titanite. Colourless epidote is invariably present, and is considered of metamorphic origin. (M)

R.A. Daly (1912, p. 440)

64. **ALBITITE.** Wall-rock of the pitchblende veins, intruded into the argillite that lies in the foot-wall of the St. Louis fault, from the surface at the Ace mine, west side of Ace Lake, Martin Lake map-area, Sask.

74–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–9*

Fine-grained, porcelaneous red rock consisting largely of fine untwinned albite or quartz with disseminated chlorite, minor specularite, and disseminated carbonate. Carries some veinlets of well-twinned albite. Tazin in age.

K.R. Dawson (1951, p. 21)

65. **GRANITE.** Road-cut along the Ferguson highway, across the entire width of the body, starting 8,000 feet south of the junction of highway 64 and the

	66	67	68	69	70
SiO_2	68.07	67.70	67.25	67.11	66.97
Al_2O_3	15.26	16.30	15.59	16.92	16.44
Fe_2O_3	1.32	0.58	1.52	1.37	nil
FeO	2.79	1.74	2.59	1.44	3.96
MgO	0.40	0.96	2.32	0.89	0.79
CaO	1.79	3.74	4.53	3.40	2.34
Na_2O	4.33	4.26	3.65	4.80	2.95
K_2O	5.09	2.19	1.64	2.12	4.72
H_2O+			0.36	0.80	1.22
H_2O-	0.11	1.13	0.15	0.07	0.09
TiO_2	0.34	0.43	0.55	0.40	0.40
P_2O_5	0.10		0.30	0.19	0.29
MnO	0.05		0.01	0.04	0.08
CO_2	0.19	0.65	nil	0.06	nil
S	0.21		nil		0.27
Cl	trace				trace
BaO	0.18				trace
Li_2O	nil				
ZrO_2	0.04				
Cr_2O_3			nil		
NiO			trace		
Total	100.27	99.68	100.46	99.61	100.52
Less O≡ S	0.08				0.10
	100.19				100.42

NORMS

	66	67	68	69	70
QTZ	16.64	22.93	24.63	21.19	22.20
CO	–	.11	.95	1.08	3.21
OR	30.15	13.24	9.76	12.68	28.38
AB	38.89	39.04	32.94	43.52	26.89
AN	7.13	18.97	19.01	15.81	9.88
LC	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	.20	–	1.15	.40	.61
RU	–	–	–	–	–
IL	.52	.61	.20	.56	.56
PY	.54	–	–	–	.71
HE	–	–	–	–	–
MT	1.37	.61	1.59	1.44	–
EN	1.11	2.72	6.49	2.50	2.23
FS	2.58	1.72	3.22	.78	5.30
OL	–	–	–	–	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	–	–	–
WO	.80	–	–	–	–

Ferguson highway, and continuing for 2,800 feet, McLaren tp., Nipissing district, Ont.

31–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1952–15*

Coarse-grained augen granite.

(W.G. Johnston)

66. **GRANITE (QUARTZ MONZONITE).** Northeastern band of Pakesley granite; Cross Narrows, Pickerel River, Parry Sound district, Ont.

41–H–E½ (Anal. R.J.C. Fabry) Ser. No. *1930–22*

(T.T. Quirke)

67. **GRANODIORITE.** Small stock or irregular body cutting the Slocan Series; Carbonet No. 2 claim, upper valley of Robb Creek, Slocan map-area, Kootenay district, B.C.

82–F–W½ (Anal. W.A. Jones) Ser. No. *1934–35*

Medium-grained, holocrystalline, quartz-biotite granodiorite. Quartz abundant, orthoclase predominant potash feldspar. Plagioclase commonly zoned. Hornblende and biotite comparatively abundant. Accessory minerals include magnetite, apatite, sphene, sulphides. Chlorite, sericite, calcite, and epidote are secondary.

C.E. Cairnes (1934, p. 70)

68. **HORNBLENDE BIOTITE QUARTZ DIORITE (QUARTZ DIORITE).** Bendor intrusive body; near head of Copp Creek on the southeast side of the valley, a few hundred feet above the valley bottom, Lillooet district, B.C.

92–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1934–2*

Massive, coarse-grained, fresh, quartzose intrusive body composed mainly of quartz and andesine, zoned in part and a little orthoclase; a few per cent each of hornblende and brown biotite; accessory titanite, epidote and apatite; a little calcite and (?) zoisite; minute flakes of, probably, sericite, a little sulphide, and (?) magnetite. (M)

C.E. Cairnes (1937, p. 37) *See also* No. 20 *(1934–3)*

69. **BIOTITE GRANODIORITE (GRANODIORITE).** Lacorne massif; north end of Lacorne tp., rge. 3, lot 16, Abitibi co., Que.

32–C–W½ (Anal. J. Hitchins) Ser. No. *1955–42*

Fine-grained, massive grey rock containing visible poikiloblastic microcline, over 10% quartz, and fine-grained mica flakes. Plagioclase forms subhedral phenocrysts that are clouded by areas of microscopic clinozoisite grains. Some plagioclase grains are zoned, others are twinned.

	71	72	73	74	75
SiO_2	66.65	66.55	66.55	66.46	66.46
Al_2O_3	15.33	16.21	15.79	18.66	15.34
Fe_2O_3	2.53	1.98	0.15	0.53	1.68
FeO	1.19	1.80	3.08	2.02	1.83
MgO	0.38	1.32	2.14	0.87	1.11
CaO	1.40	3.86	3.47	3.29	3.43
Na_2O	4.43	4.07	4.39	5.15	4.86
K_2O	6.45	2.84	2.80	2.21	4.58
H_2O+		0.24	0.40	0.39	0.29
H_2O-	1.50	0.01	0.05	0.04	
TiO_2	0.30	0.40	0.60	0.36	0.27
P_2O_5	0.06	0.15	0.04	0.17	0.08
MnO	0.02	0.12	0.06	0.03	
CO_2				0.09	
F	0.09				
SrO		0.01	0.01		
BaO		0.03	0.03		
MoS_2	0.12				
Total	100.44 (100.45)	99.59	99.56	100.27	99.93
Sp.gr.		2.693	2.678	2.68	

NORMS

	71	72	73	74	75
QTZ	12.76	20.36	16.81	17.48	12.37
CO	–	–	–	2.38	–
OR	38.56	16.97	16.64	12.99	27.02
AB	40.16	36.88	39.56	45.91	43.48
AN	2.87	17.71	15.14	15.13	6.45
LC	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	.12	.31	.08	.35	.16
RU	–	–	–	–	–
IL	.42	.56	.83	.49	.37
PY	–	–	–	–	–
HE	.30	–	–	–	–
MT	2.20	2.08	.15	.54	1.74
EN	1.06	3.70	5.97	2.40	3.07
FS	–	1.04	3.93	2.28	1.28
OL	–	–	–	–	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	–	–	
WO	1.50	.34	.84	–	4.00

Quartz is clear and occurs in the interstices. Biotite, partly replaced by chlorite, and epidote are the main mafic minerals. Sphene, zircon, magnetite, and microcline are present in accessory quantities. (M)

(K.R. Dawson)

70. DIABASE. Acid phase of an olivine diabase dyke intruding quartzite and diabase; from outcrop about ½ mile south of Kelley Lake, McKim and Waters tps., Sudbury district, Ont.

41–I–W½ (Anal. R.J.C. Fabry) Ser. No. *1931–8*

Fine-grained, pink, granitic rock closely resembling some phases of the micropegmatite of the nickel irruptive. Composed mainly of quartz and feldspar. A few larger crystals of plagioclase are completely altered to white mica-epidote. Feldspars are all between orthoclase with a little ingrown sodic feldspar and pure albite. Sodic oligoclase with alkali feldspar forms mosaic with quartz. Ferromagnesian minerals are chlorite, a golden-yellow shredded biotite, and epidote.

(T.C. Phemister)

71. QUARTZ SYENITE. Masses and dykes intrusive in batholithic porphyritic syenite; Oslow tp., rge. 7, lots 9 and 10, Pontiac co., Que.

31–F–E½ (Anal. M.F. Connor) Ser. No. *1924–2*

A fine, massive, pink, syenitic rock, free from fractures along which mineralizing solutions could penetrate, and remote from the ore masses. Consists almost entirely of a mosaic of irregular grains of quartz, microcline, and plagioclase ($Ab_{95}An_5$), and contains small aggregates of quartz, fluorspar, and molybdenite, a few inches in diameter.

M.E. Wilson (1924, p. 74)

72. GRANODIORITE. Similkameen batholith; on the wagon road following the west side of the Similkameen River valley at a point 3 miles north of the slash marking the International Boundary, Similkameen district, B.C.

82–E–W½ (Anal. M.F. Connor) Ser. No. *1912–76*

Medium- to coarse-grained, light pinkish grey rock. Essential constituents are hornblende, biotite, quartz, basic oligoclase, and the alkaline feldspars microperthite, microcline, microcline-microperthite, and orthoclase (rare). Microperthite is the most abundant alkaline feldspar. Accessories are magnetite, apatite, and beautifully crystallized titanite. Allanite is a rare accessory. Epidote is occasionally present but apparently secondary. (M)

R.A. Daly (1912, p. 456)

73. GRANODIORITE (QUARTZ DIORITE). Castle Peak stock; southwest spur of Mount Frosty, Hozameen Range, Yale district, B.C.

92–H–E½ (Anal. M.F. Connor) Ser. No. *1912–79*

	76	77	78	79	80
SiO_2	66.30	65.91	64.98	64.96	64.83
Al_2O_3	15.27	15.45	17.15	16.53	15.77
Fe_2O_3	1.90	2.89	0.83	2.56	1.44
FeO	2.60	2.19		2.90	2.43
MgO	1.56	1.19	1.06	1.21	1.80
CaO	2.85	2.08	3.72	4.74	4.40
Na_2O	3.40	3.86	5.29	4.47	4.73
K_2O	4.94	4.19	6.50	0.98	2.63
H_2O+	0.24	0.61	} 0.64	0.70	0.46
H_2O-	0.07	0.04		0.06	0.02
TiO_2	0.36	0.69		0.41	0.42
P_2O_5	0.33	0.34		0.18	0.20
MnO	trace	0.04		0.07	0.08
CO_2	trace	0.24		0.05	0.35
S	0.19	0.20			
BaO	0.11	0.21			
Total	100.12	100.13	100.17	99.82	99.56
Less O ≡ S	0.07	0.08			
	100.05	100.05			
Sp.gr.					2.73

NORMS.

	76	77	78	79	80
QTZ	17.77	20.35	2.70	21.33	14.86
CO	—	1.32	—	—	—
OR	29.42	25.14	37.75	5.89	15.69
AB	30.70	35.12	46.58	40.78	42.79
AN	11.84	9.27	3.73	22.49	14.11
LC	—	—	—	—	—
NE	—	—	—	—	—
KP	—	—	—	—	—
AP	.69	.72	—	.38	.42
RU	—	—	—	—	—
IL	.50	.97	—	.57	.58
PY	.49	.52	—	—	—
HE	—	—	.56	—	—
MT	1.99	3.05	—	2.71	1.51
EN	4.36	3.35	2.89	3.42	5.04
FS	1.87	.13	—	2.27	2.31
OL	—	—	—	—	—
AC	—	—	—	—	—
NSI	—	—	—	—	—
KSI	—	—	—	—	—
DI	—	—	—	—	—
WO	.31	—	5.76	.09	2.63

Fresh, light grey, granitic rock of medium grain. In the ledge the mass of dominant quartz and feldspar is speckled with fairly abundant lustrous black hornblende and biotite. The principal feldspar is plagioclase, often zoned; orthoclase, probably sodiferous, is less abundant. Hornblende is deep green; a few of its crystals contain small cores of augite or felted uralite apparently derived from augite; no free pyroxene is present. Magnetite or ilmenite, apatite and titanite are accessory. (M)
R.A. Daly (1912, p. 493)

74. GRANODIORITE. Lacorne massif; middle Lacorne tp., rge. 3, lot 11, Abitibi co., Que.

32–C–W½ (Anal. J. Hitchins) Ser. No. *1955–41*

Fine-grained biotite granodiorite, foliated, possibly cataclastic. Plagioclase occurs in subhedral grains lightly clouded by clinozoisite and sericite. Microcline and quartz are unaltered and interstitial. Biotite is the principal mafic mineral and occurs in brown unaltered flakes. Accessory amounts of sphene, clinozoisite, apatite, and magnetite are present. (M)
(K.R. Dawson)

75. GRANITE. Nelson batholith; Kootenay district, B.C.

82–F–W½ (Anal. M. Dittrich) Ser. No. *1902–1*

A grey hornblende-biotite granite characterized by large phenocrysts of feldspar. In places it is uniform in grain, and phenocrysts are not observable. When mechanically deformed, it becomes a typical augen gneiss.

R.W. Brock (1903, p. 101)

76. GRANODIORITE. Bekanon batholith; 16,000 feet west of Ludgate station, on Key Inlet, Georgian Bay, Parry Sound district, Ont.

41–H–E½ (Anal. R.J.C. Fabry) Ser. No. *1930–12*

Highly streaked and gneissic. Exposed in nearly continuous cliff faces on both sides of the waterway. General structure is a series of steep folds, which plunge southward. Quartzose with inclusions of pink country gneiss. (M)
(T.T. Quirke)

77. GRANITE (QUARTZ MONZONITE). Bad River batholith; from the middle of the mass west of King's place on the main east-west channel of French River, Sudbury district, Ont.

41–I–E½ (Anal. R.J.C. Fabry) Ser. No. *1930–8*

Pink porphyritic intrusive rock that becomes gneissic towards the edges. Consists of large, much altered orthoclase phenocrysts with interstitial aggregates of brown biotite, green amphibole, abundant apatite, and small areas of orthoclase and albite. (M)
(T.T. Quirke)

	81	82	83	84	85
SiO_2	64.80	64.70	64.52	64.44	64.21
Al_2O_3	15.74	14.13	15.58	17.05	16.47
Fe_2O_3	2.29	2.62	2.13	1.53	1.78
FeO	2.44	4.44	2.18	2.40	1.89
MgO	2.09	1.40	2.32	1.28	1.18
CaO	5.20	3.22	3.88	4.28	3.72
Na_2O	3.55	5.43	3.70	5.16	4.09
K_2O	2.17	1.72	4.02	1.48	2.53
H_2O+		0.66	0.67	0.78	0.61
H_2O-	1.40	0.08	0.22	0.02	0.02
TiO_2	0.40	1.11	0.80	0.45	0.35
P_2O_5		0.45	0.34	0.31	0.69
MnO	0.10	0.05	0.05	0.03	trace
CO_2		trace			1.71
S		0.08	0.03		0.20
Cl		trace	0.10		
SrO			trace		
BaO		0.02	0.06		
ZrO_2		0.02			
Cr_2O_3			nil		
Total	100.18	100.13	100.60	99.21	99.45
Less O≡S,Cl		0.03	0.03		0.08
		100.10	100.57		99.37

NORMS

	81	82	83	84	85
QTZ	20.57	16.73	17.09	16.44	21.52
CO	–	–	.45	–	2.10
OR	13.09	10.29	24.14	8.85	15.43
AB	32.47	49.25	33.69	46.82	37.83
AN	20.97	9.18	13.06	19.17	14.39
LC	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	–	.95	.72	.65	1.48
RU	–	–	–	–	–
IL	.56	1.58	1.12	.63	.50
PY	–	.21	.07	–	.53
HE	–	–	–	–	–
MT	2.43	2.76	2.25	1.61	1.91
EN	5.92	3.93	6.54	3.60	3.38
FS	1.81	3.44	.81	2.08	.87
OL	–	–	–	–	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	–	–	–
WO	2.14	1.64	–	.10	–

78. **DYKE ROCK.** In serpentine; Asbestos Corporation Property, Thetford Mines, Ireland tp., Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1936–25*

(Unpublished data from Analytical Chemistry Laboratory files)

79. **FELDSPAR PORPHYRY (GRANODIORITE).** Malartic satellite; on the lake shore, rge. 10, lot 42, north end, Abitibi co., Que.

32–D–E½ (Anal. M. Staples) Ser. No. *1955–34*

Dense grey rock showing weak foliation, indistinct feldspar phenocrysts and fine-grained biotite flakes. Plagioclase phenocrysts, composition An_{13}, are well twinned and locally zoned. Quartz occurs in the matrix. Biotite is present in brownish green flakes, and shows fluxion texture. (M)

(K.R. Dawson)

80. **HORNBLENDE BIOTITE GRANODIORITE (GRANODIORITE).** Lacorne massif; north end Lacorne tp., rge. 9, lot 40, Abitibi co., Que.

32–C–W½ (Anal. J.A. Hitchins, J.A. Maxwell) Ser. No. *1955–28*

Fine-grained rock. Plagioclase, locally in augen-shaped aggregates, possible cataclasis, and clouded by sericite and clinozoisite, shows broad zones, evidence of secondary rims, and is well twinned. Microcline is unaltered and interstitial with a few myrmekitic embayments. Biotite is brown, and is associated with hornblende and epidote. Orientated hornblende is dark green and unaltered. Accessory quantities of clinozoisite, sphene, and apatite are present. (M)

(K.R. Dawson)

81. **QUARTZ DIORITE (QUARTZ GABBRO).** Westkettle batholith; near Wallace Lake, Westkettle Valley, Similkameen district, B.C.

82–E–W½ (Anal. M.F. Connor) Ser. No. *1915–72*

Black and white, even-grained, granular rock, containing feldspar, quartz, biotite, and hornblende. (M)

L. Reinecke (1915, p. 43)

82. **PORPHYRY (MONZONITE).** Broadly wedge-ended sill intruded in nearly vertical attitude between local gneisses; quarry near Britt station, Parry Sound district, Ont.

41–H–E½ (Anal. R.J.C. Fabry) Ser. No. *1930–17*

Dunlop porphyry, a very coarse, pink, distinctly quartzose, massive rock, in some places somewhat spotted with areas of finer grained materials richer in hornblende. Shows slight signs of shearing. Feldspars are sheared into eye-shaped crystals and the dark minerals are arranged with long dimension parallel to the general direction of shearing. Chiefly cloudy albite, clear orthoclase, and quartz, with subordinate proportions of biotite and amphibole. Titanite, magnetite, apatite, and muscovite are accessory.

(T.T. Quirke)

83. **SYENITE GNEISS.** Intrusive body in the Couchiching and Keewatin series; north side of the entrance of the narrows between Rocky Inlet Bay and Rice Bay, Rainy Lake, Rainy River district, Ont.

52–C–W½ (Anal. M.F. Connor) Ser. No. *1913–45*

Composed of fresh orthoclase and microcline, a little acid plagioclase, abundant biotite, abundant primary epidote, some titanite, and a small amount of quartz. Structure is in part cataclastic, and granophyric in limited areas. The matrix holds large phenocrysts of orthoclase in parallel orientation.

A.C. Lawson (1913, p. 91)

84. **GRANODIORITE.** Siwash Creek, Tulameen district, B.C.

92–H–E½ (Anal. M.F. Connor) Ser. No. *1913–18*

Coarse, even-grained rock of uniform composition consisting of orthoclase, considerable unzoned plagioclase about oligoclase in composition, smaller grains of quartz of irregular outline, interstitial between the feldspar crystals and much brown biotite. The feldspars are generally altered. A few shreds of muscovite give evidence of pressure in the bending of the crystals. Augite in considerable amount, epidote the most abundant accessory constituent; magnetite, apatite, and zoisite are also present.

C. Camsell (1913, p. 77)

85. **SYENITE PORPHYRY (GRANODIORITE).** Large intrusive body cutting Keewatin schists and greenstones, and carrying gold deposits; footage 265–289, diamond drill hole 24, East Malartic Mines Ltd., Fourniere tp., Abitibi co., Que.

32–D–W½ (Anal. R.J.C. Fabry) Ser. No. *1937–1*

Consists of albite (An_4) phenocrysts up to 2.5 mm in diameter in a granular mixture of quartz and albite, with biotite the principal accessory. Muscovite, magnetite, sericitic mica, apatite, and pyrite are minor accessories. The rock is slightly carbonized. (M)

H.C. Gunning and J.W. Ambrose (1940, p. 35)

86. **QUARTZ MONZONITE.** St. Edmund satellite; north end Vassan tp., rge. 4, lot 58, Abitibi co., Que.

32–C–W½ (Anal. J.A. Maxwell) Ser. No. *1955–29*

	86	87	88	89	90
SiO_2	63.95	63.60	63.40	63.30	62.86
Al_2O_3	15.35	14.20	12.70	17.64	20.41
Fe_2O_3	1.69			1.58	0.35
FeO	2.83	1.92	4.23	3.08	0.14
MgO	2.22	6.84	3.37	1.23	0.20
CaO	4.19	4.37	7.50	5.03	1.20
Na_2O	4.42	5.09	7.95	4.56	4.87
K_2O	3.58	4.13	0.13	1.16	7.35
H_2O+	0.57			0.51	0.59
H_2O-	0.03			0.14	0.04
TiO_2	0.43			0.50	0.35
P_2O_5	0.29			0.27	0.34
MnO	0.07			0.47	0.01
CO_2					1.16
S					0.05
SrO				nil	
BaO				0.05	
volatile		0.70	0.40		
Total	99.62	100.85	99.68	99.52	99.92
Sp.gr.	2.74	2.71–2.72	2.748–2.764	2.721	

NORMS

	86	87	88	89	90
QTZ	12.34	.79	1.49	17.30	4.17
CO	–	–	–	.30	3.31
OR	21.31	23.54	.75	6.95	43.32
AB	39.89	43.99	66.85	41.47	43.51
AN	11.50	3.53	–	23.78	3.72
LC	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	.61	–	–	.57	.70
RU	–	–	–	–	.17
IL	.60	–	–	.70	.14
PY	–	–	–	–	.12
HE	–	–	–	–	.24
MT	1.77	–	–	1.67	–
EN	6.21	18.32	9.14	3.46	.55
FS	2.72	2.85	6.37	3.75	–
OL	–	–	–	–	–
AC	–	–	–	–	–
NSI	–	–	.83	–	–
KSI	–	–	–	–	–
DI	–	–	–	–	–
WO	3.00	6.95	14.54	–	–

Fine-grained rock. Plagioclase and microcline are the chief salic minerals. Plagioclase has been partly replaced by microscopic clinozoisite and white mica, tends to be euhedral, and shows imperfect zones and twin lamellae. The microcline is unaltered and interstitial. Hornblende, the principal mafic mineral, is unaltered but carries inclusions of quartz and clinozoisite. Accessory amounts of magnetite, hematite, apatite, and clinozoisite were observed. (M)

(K.R. Dawson)

87. **DIORITE.** St. Francis, Beauce co., Que.

21–L–E½ (Anal. T.S. Hunt) Ser. No. *1856–6*

Pale bluish green, consists of admixture of an imperfectly crystallized hornblende with a somewhat translucent cleavable feldspar.

T.S. Hunt (1857, p. 454)

88. **DIORITE.** Brompton Lake, Orford tp., rge. 16, lot 2, Sherbrooke co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1856–5*

White, with a greenish or yellowish grey tinge.

T.S. Hunt (1857, p. 453)

89. **GRANODIORITE (QUARTZ DIORITE).** Western phase of the Remmel batholith; 2 miles south of the International Boundary, and 2,000 yards from the contact of the Ashnola gabbro, Okanagan Range, B.C.

92–H–E½ (Anal. M.F. Connor) Ser. No. *1912–73*

Medium- to coarse-grained, slightly porphyritic rock, exhibits lustrous black biotite phenocrysts in conspicuous, often quite idiomorphic foils. Original texture is normal eugranite. Essential constituents are biotite, deep brownish green hornblende, quartz, andesine, orthoclase; titanite, magnetite, and apatite are accessory constituents. (M)

R.A. Daly (1912, p. 144)

90. **SYENITE.** Mile-wide pegmatite core of the Copper Mountain stock; 14 inches from the contact with the intermediate zone of the stock, 2,500 feet south of the pumping station, Similkameen Canyon, Similkameen district, B.C.

92–H–E½ (Anal. ?) Ser. No. *1934–28*

The stock varies from a syenogabbro at the outer margin to a central core of nearly pure feldspar. Inside the knife-sharp contact with the intermediate zone, the rock becomes coarser in grain and more pink; augite disappears; biotite is present in only minute quantities, the chief Fe-Mg mineral being penninite. Nearly 90% of the rock consists of feldspar, and of this plagioclase forms about ⅓, the remainder being made up of orthoclase, microcline, and microperthite. Apatite is an abundant accessory occurring in large, glassy crystals. Muscovite and sericite are present as alteration products and chalcopyrite and bornite are freely scattered through the pegmatite.

V. Dolmage (1934, p. 13) *See also* Nos. 102, 134, 161, 196 *(1934–29, 27, 26, 25)*

91. **GRANITE PORPHYRY.** Dykes cutting the pulaskite stocks; foot-wall of the Black Bear ore shoot, 700-foot level, Le Roi mine, 5 miles north of the International Boundary, 6 miles west of the Columbia River Rossland Mining Camp, Trail Creek mining division, West Kootenay district, B.C.

82–F–W½ (Anal. N.L. Turner) Ser. No. *1915–34*

Pinkish to grey, medium- to fine-grained fresh rock composed of quartz, microperthite, orthoclase, oligoclase, hornblende, and a little biotite.

C.W. Drysdale (1915b, p. 33)

92. **GRANODIORITE (QUARTZ DIORITE).** Saanich batholith; south shore of Shoal Harbour, North Saanich district, Vancouver Island, B.C.

92–B–W½ (Anal. M.F. Connor) Ser. No. *1913–34*

Light coloured, medium-grained rock, exhibits characteristic granitic and frequently gneissic texture. Consists of zoned andesine occurring in euhedral grains and interstitially; interstitial orthoclase frequently intergrown with a little albite, interstitial quartz, euhedral hornblende, and sometimes greenish brown biotite. Accessory minerals are magnetite, pyrite, titanite, and apatite. The quartz and potash feldspars are in places graphically intergrown. The original minerals have been fractured, strained, and even distorted. They are moderately altered, the hornblende altering to biotite, chlorite, and epidote and the biotite to chlorite. The feldspars are partly altered to, and replaced by, sericite, kaolin, and calcite. (M)

C.H. Clapp (1913, p. 73)

93. **HORNBLENDE BIOTITE PULASKITE.** Coryell batholith; north of Record Mountain, between Record Mountain ridge and Christina Lake, Columbia Mountain system, West Kootenay district, B.C.

82–E–E½ (Anal. M. Dittrich) Ser. No. *1902–26*

Medium- to coarse-grained, occasionally porphyritic, light reddish to brownish pink rock. Principal feldspar is microperthite, associated with much sodiferous orthoclase and subordinate plagioclase, averaging andesine. Few small idiomorphic crystals of diopsidic augite, a little interstitial quartz, rare grains of allanite, and the usual accessory apatite, titanite, and magnetite.

R.W. Brock (1903, p. 104)

	91	92	93	94	95
SiO_2	62.73	62.64	62.59	62.35	62.30
Al_2O_3	16.17	17.75	17.23	11.79	16.12
Fe_2O_3	0.28	1.64	1.51	3.44	1.06
FeO	3.58	3.44	2.02	7.01	4.30
MgO	1.76	2.53	1.30	1.29	2.00
CaO	3.03	4.44	1.99	4.53	4.13
Na_2O	5.74	3.53	5.50	3.43	2.53
K_2O	5.11	2.14	6.74	2.01	5.14
H_2O+	} 0.45	} 1.65	} 0.30	0.64	0.35
H_2O-				0.26	0.04
TiO_2	0.60	0.60	0.54	1.45	0.93
P_2O_5	0.14	0.25	0.11	1.59	0.94
MnO	0.06	0.14	trace		0.04
CO_2			trace	trace	trace
S	0.08				0.25
SO_3			trace		
Cl	0.13		trace		
SrO	0.25				
BaO	0.19				0.14
Total	100.50 (100.30)	100.75	99.83	99.78 (99.79)	100.37 (100.27)
Less O≡S, Cl	0.06				0.09
	100.44 (100.24)				100.28 (100.18)
Sp.gr.		2.71		2.83	

NORMS

	91	92	93	94	95
QTZ	.52	18.23	–	23.66	15.13
CO	–	2.35	–	–	.94
OR	29.73	12.82	39.18	12.44	30.75
AB	50.63	32.07	48.47	32.20	22.95
AN	3.16	20.67	2.32	11.31	15.22
LC	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	.28	.52	.22	3.48	1.98
RU	–	–	–	–	–
IL	.82	.84	.73	2.11	1.30
PY	.20	–	–	–	.65
HE	–	–	–	–	–
MT	.28	1.73	1.54	3.75	1.11
EN	4.81	7.12	2.59	3.75	5.62
FS	4.38	3.60	.61	6.72	4.28
OL	–	–	1.64	–	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	2.64	–	–
WO	5.15	–	–	.53	–

94. **HYBRID ROCK (GRANODIORITE).** Intermediate zone of the Sudbury irruptive; in the neighbourhood of the boundary of Snider and Creighton tps., Sudbury district, Ont.

41–I–W½ (Anal. T.C. Phemister) Ser. No. *1932–42*

Most acid variety of the intermediate zone, characterized by an abundance of markedly pink feldspar crystals between which run lenses and patches of biotite. Some crystals are long and in places the rock becomes very coarse grained. Grains of quartz are scattered throughout the rock. The amount of dark minerals varies considerably. The feldspar shows albite, pericline, and usually Carlsbad twinning. Not all are of the same composition, the most calcic being $Ab_{70}An_{30}$, but the commonest type is $Ab_{95}An_{5}$. The outer parts of the crystals are almost invariably microperthite, and the inner parts much altered to white mica and epidote. Biotite is the chief dark mineral, in small flaky crystals which form aggregates in which there are also present titanite and epidote. Hornblende is present in small amounts. Micropegmatite is variable in amount. Apatite prisms are present. Patches of epidote and white mica aggregates apparently represent crystals of more calcic plagioclase. These are frequently surrounded and veined by biotite.

(T.C. Phemister)

95. **GRANITE (SYENITE).** Dokis granite, intruded into pink gneiss; the east side of the south end of Dokis Island, Georgian Bay, Parry Sound district, Ont.

41–H–E½ (Anal. R.J.C. Fabry) Ser. No. *1930–10*

Grey to pale pink, coarse quartz and feldspar porphyry, in places massive, but in most parts gneissic, especially near the contacts with the gneiss. Microcline is abundant. Quartz is not abundant but occurs in conspicuous large grains. The other minerals are medium grained with no interlocking. Amphibole and biotite occur in small flakes or irregular shapes. Large skeletal garnets occur amongst other dark minerals. Plagioclase ($Ab_{85}An_{15}$) is partly replaced by microcline, and contains minute amounts of potash feldspar in antiperthitic intergrowth. Apatite and magnetite are minor accessory minerals. (M)

(T.T. Quirke)

96. **HYBRID ROCK (GRANODIORITE).** Intermediate zone of Sudbury irruptive; in the neighbourhood of the boundary of Snider and Creighton tps., Sudbury district, Ont.

41–I–W½ (Anal. T.C. Phemister) Ser. No. *1932–41*

Feldspar is decidedly pink, and some crystals are markedly prismatic. Streaks and patches of the rock are richer in the lighter coloured constituents. The feldspar ($Ab_{85-70}An_{15-30}$) is altered to white mica and epidote

	96	97	98	99	100
SiO_2	62.24	62.08	62.08	62.04	62.01
Al_2O_3	12.07	17.91	16.61	17.63	13.59
Fe_2O_3	4.22	1.08	1.53	1.98	6.68
FeO	6.32	3.08	3.72	1.57	1.96
MgO	1.63	1.17	2.44	0.99	1.18
CaO	4.81	4.54	5.20	1.75	2.98
Na_2O	4.40	5.12	3.18	4.73	5.17
K_2O	1.23	2.96	3.29	6.74	5.17
H_2O+	0.84	0.20	1.00	1.18	0.04
H_2O-	0.25	0.05	0.16	0.12	0.08
TiO_2	1.80	0.54	0.73	0.72	0.71
P_2O_5	0.81	0.17	0.30	0.17	0.41
MnO		0.11	0.11	trace	
CO_2	trace			0.20	nil
S					0.08
SrO		trace	0.03		
BaO		0.14	0.09		
Total	100.62	99.77 (99.15)	100.47	99.82	100.06
Less O≡ S					0.03
					100.03
Sp.gr.	2.82		2.754	2.497	

NORMS

	96	97	98	99	100
QTZ	20.20	8.31	14.47	3.84	7.85
CO	–	–	–	–	–
OR	7.50	17.55	19.72	40.06	30.77
AB	40.71	46.03	28.90	42.62	43.77
AN	9.83	17.14	21.56	6.94	–
LC	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	1.74	.35	.63	.35	.86
RU	–	–	–	–	–
IL	2.58	.75	1.02	1.00	.99
PY	–	–	–	–	.20
HE	–	–	–	–	2.18
MT	4.53	1.12	1.61	2.07	2.86
EN	4.67	3.26	6.87	2.76	3.30
FS	4.46	3.43	3.89	.04	–
OL	–	–	–	–	–
AC	–	–	–	–	2.30
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	–	–	–
WO	3.73	2.01	1.28	.26	4.87

and its pink colour is caused by the presence of dusty iron oxide connected with the fine-grained white mica. The outer part of many plagioclase crystals is coarse microperthite continuous with that in intergrowth with quartz. Amphibole, blue-green to yellow-brown, is typically intergrown with biotite, quartz, titanite and ilmenite. Abundant titanite is associated with ilmenite, epidote, and apatite in large euhedral crystals.

(T.C. Phemister)

97. **GRANODIORITE.** Large batholith; Hedley Mining district, B.C.

92–H–E½ (Anal. M.F. Connor) Ser. No. *1910–10*

Light coloured, medium-grained, fresh rock. Contains many rounded or oval-shaped basic segregations and is frequently traversed by small veinlets of feldspar or quartz. Fairly uniform in texture and composition throughout the body. Zoned plagioclase is the most abundant constituent, and is idiomorphic towards the orthoclase. Orthoclase is much less abundant, and forms frequent intergrowths with quartz. Quartz occurs in the interstices between other constituents. Dark green hornblende, and flakes and shreds of biotite frequently showing a rim of magnetite, are also essential. Accessory minerals are titanite, apatite, zircon, magnetite, and pyrite. Small mica flakes occur in the orthoclase crystals.

C. Camsell (1910, p. 96)

98. **GRANODIORITE (QUARTZ MONZONITE).** Trail batholith; railway cutting 2 miles west of Trail, Rossland Mountain Group, Kootenay district, B.C.

82–F–W½ (Anal. M.F. Connor) Ser. No. *1912–56*

Medium-grained to somewhat coarse-grained rock of pure grey colour. Rich in dark green hornblende, biotite, and plagioclase. Quartz and orthoclase are also essential. Accessory minerals are magnetite, apatite, and titanite with rare zircons. Orthoclase is often replaced by microcline; plagioclase is often zoned and averages basic andesine. (M)

R.A. Daly (1912, p. 347)

99. **PULASKITE PORPHYRY (MONZONITE).** Sill, and offshoot of a chonolithic injection into sandstone; 400 yards northeast of the Kettle River bridge, 6 miles above Midway, Similkameen district, B.C.

82–E–E½ (Anal. M. Dittrich) Ser. No. *1912–68*

Uniform in habit and composition, light pinkish fawn, and carries abundant phenocrysts of pale, flesh-pink, thick tabular feldspars, and some phenocrysts of biotite. The groundmass is a typically trachytic mass of tabular feldspars, with which a few small biotites and rare prisms of green hornblende are associated. A little interstitial quartz and small amounts of titanite, apatite, and magnetite are accessory. It is highly miarolitic with actual cavities between the feldspars.

R.A. Daly (1912, p. 419)

	101	102	103	104	105
SiO_2	61.98	61.84	61.77	61.17	60.62
Al_2O_3	14.71	19.35	18.05	13.46	16.07
Fe_2O_3	1.57	1.03	1.77	0.38	1.45
FeO	3.63	0.53	1.75	3.72	5.73
MgO	4.29	0.54	0.89	3.82	1.49
CaO	4.68	1.06	1.54	5.17	2.66
Na_2O	4.00	6.07	6.83	4.68	6.10
K_2O	3.10	7.12	5.21	1.67	5.13
H_2O+	0.85	0.76	) 1.10	0.99	) 0.36
H_2O	0.06	0.24		0.01	
TiO_2	0.41	0.10	0.74	0.49	1.05
P_2O_5	0.28	0.17	0.15	0.28	0.34
MnO	0.08	0.03	0.08	trace	0.22
CO_2		0.92	0.00	3.70	
S		trace		0.16	
Total	99.64	99.76	99.88	99.70	101.22
Less O≡S				0.06	
				99.64	
Sp. gr.	2.76				

NORMS

	101	102	103	104	105
QTZ	10.09	–	–	11.54	–
CO	–	.12	–	–	–
OR	18.44	41.75	30.39	10.27	29.74
AB	36.09	47.36	57.76	43.64	51.18
AN	13.06	4.11	3.11	11.19	1.25
LC	–	–	–	–	–
NE	–	3.95	1.59	–	1.45
KP	–	–	–	–	–
AP	.58	.35	.30	.63	.69
RU	–	–	–	–	–
IL	.57	.13	1.01	.70	1.43
PY	–	–	–	.43	–
HE	–	–	–	–	–
MT	1.64	1.06	1.82	.41	1.48
EN	12.00	–	–	11.04	–
FS	4.09	–	–	4.70	–
OL	–	1.12	1.21	–	5.13
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	2.76	–	7.61
WO	3.38	–	–	5.41	–

100. **BIGWOODITE (MONZONITE).** Plutonic replacement sill lying within Huronian gneisses; Bigwood tp., con. 4, northeast corner of lot 11, Sudbury district, Ont.

41–E–E½ (Anal. R.J.C. Fabry) Ser. No. *1933–6*

Medium-grained, pink rock with irregularly distributed bands or patches of dark minerals, which occur as lenticular concentrations. Fundamentally of microcline, irregularly replaced in microperthitic texture by plagioclase ($Ab_{90}An_{10}$). Both feldspars are quite fresh and unaltered. Most of the albite is untwinned. Hornblende is bright green, and highly pleochroic. In many specimens hornblende is not present, aegerine-augite or biotite being the dark minerals in such cases. (M)

(T.T. Quirke)

101. **HORNBLENDE BIOTITE SYENODIORITE (SYENODIORITE).** Border phase of Lacorne massif; La Motte tp., rge. 7, south end of lot 57, Abitibi co., Que.

32–D–E½ (Anal. J. Hitchins) Ser. No. *1955–40*

Melanocratic, weakly foliated rock showing rounded aggregates of hornblende and white feldspar. Plagioclase, some of which may be secondary, is clouded by some sericite and clinozoisite and tends to be euhedral. Microcline is unaltered and interstitial along with the quartz. Brownish green flakes of biotite and dark green prismatic grains of hornblende are the principal mafic minerals. Accessory quantities of epidote, apatite, sphene, and possible zircon are present. (M)

(K.R. Dawson)

102. **SYENITE.** Pegmatite core of the Copper Mountain stock; 1,500 feet from the knife-sharp contact with the intermediate zone, Similkameen Canyon, Similkameen district, B.C.

92–H–E½ (Anal. ?) Ser. No. *1934–29*

The stock varies from a syenogabbro at the outer margin to a central core of nearly pure feldspar. Inside the knife-sharp contact with the intermediate zone the rock becomes coarser in grain and more pink and augite disappears; biotite is present in only minute quantities, the chief Fe-Mg mineral being penninite. Nearly 90% of the rock consists of feldspar, and of this plagioclase forms about one-third, the remainder being made up of orthoclase, microcline, and microperthite. Apatite is an abundant accessory occurring in large, glassy crystals. Muscovite and sericite are present as alteration products and chalcopyrite and bornite are freely scattered through the pegmatite.

V. Dolmage (1934, p. 13) *See also* Nos. 90, 134, 161, 196 *(1934–28, 27, 26, 25)*

	106	107	108	109	110
SiO_2	60.52	60.51	60.34	60.27	60.00
Al_2O_3	12.05	16.71	17.24	17.17	15.33
Fe_2O_3	5.88	1.72	2.51	2.36	6.02
FeO	3.02	3.34	3.75	3.67	0.67
MgO	1.80	2.53	2.53	2.45	0.61
CaO	4.48	3.62	5.88	6.49	1.12
Na_2O	5.67	4.64	3.50	2.92	6.44
K_2O	4.42	5.20	2.42	3.25	8.15
H_2O+	0.89	0.27	0.31	0.23	0.32
H_2O-	0.10	0.03	0.09	0.15	0.08
TiO_2	0.74	0.60	0.57	0.63	0.40
P_2O_5	0.61	0.16	0.46	0.20	
MnO	0.08	0.10	0.16	0.14	0.63
CO_2	nil		nil		
S	0.15		0.10		
Cl			trace		0.09
SrO		0.12		0.04	
BaO		0.10	0.33	0.04	
Total	100.41	99.65	100.19	100.01	99.86
Less O≡S, Cl	0.06		0.04		0.02
	100.35		100.15		99.84
Sp. gr.		2.667		2.785	

NORMS

	106	107	108	109	110
QTZ	5.19	2.00	13.02	12.58	–
CO	–	–	–	–	–
OR	26.32	30.60	14.42	19.46	47.75
AB	39.81	41.40	31.63	26.51	21.37
AN	–	9.31	24.32	24.39	–
LC	–	–	–	–	–
NE	–	–	–	–	8.19
KP	–	–	–	–	–
AP	1.28	.33	.96	.42	–
RU	–	–	–	–	–
IL	1.03	.82	.79	.88	.55
PY	.39	–	.26	–	–
HE	–	–	–	–	–
MT	2.75	1.78	2.63	2.49	–
EN	5.03	6.99	7.08	6.89	–
FS	1.68	3.26	3.35	3.41	–
OL	–	–	–	–	.69
AC	9.10	–	–	–	16.58
NSI	–	–	–	–	.43
KSI	–	–	–	–	–
DI	–	–	–	–	4.40
WO	7.35	3.44	1.48	2.92	–

103. **NORDMARKITE.** Second intrusion; Brome Mountain, Brome and Shefford counties, Que.

31–H–E½ (Anal. M.F. Connor) Ser. No. *1902–27*

Light grey or fawn coloured rock of syenitic character. Microperthite is the greatly predominating constituent of the rock. The remaining constituents in order of relative abundance are biotite (in amount more than equal to total of all the other constituents except feldspar), nearly or quite colourless pyroxene, green hornblende, sphene, and apatite. Locally a little nepheline appears, and in other places a few grains of quartz.

J.A. Dresser (1903, p. 317)

104. **ALBITE PORPHYRY.** Intrusive sheet conformable with greenstone; side of 302 crosscut, O'Brian Gold mine, Cadillac tp., Abitibi co., Que.

32–D–E½ (Anal. R.J.C. Fabry) Ser. No. *1935–26*

Brownish grey sheared porphyry of which 47.5% is plagioclase, 8.5% is carbonate, and the remainder a mixture of biotite, chlorite, quartz, and accessories.

H.C. Gunning (1937, p. 22)

105. **SYENITE.** Intrusive in quartzite; Dunn Island, Labrador.

13–O–E½ (Anal. N. Sahlbom) Ser. No. *1953–14*

Coarse-grained, brownish red rock composed mainly of perthitic feldspar and small quantities of mafic minerals. Feldspars are lath-shaped with maximum length of about 1.5 cm and are mainly perthite; antiperthite is also common. Boundaries of the feldspar grains are highly sutured owing to albitization. Mafic components are mostly anhedral. The principal mafic component is a slightly pleochroic, greenish pyroxene, which has been altered into a complex of riebeckite, iron oxide, sericite, chloite, zoisite, calcite, and quartz. Biotite occurs as small, lath-shaped crystals. Sphene, apatite, calcite and magnetite are accessory. (M)

E.H. Kranck (1953, p. 21)

106. **SYENITE.** Intrusive body directly east of the Sullivan mine, and to the south of the larger Bourlamaque granodiorite intrusion, Annamaque Mine Ltd., central Bourlamaque tp., Abitibi co., Que.

32–C–W½ (Anal. R.J.C. Fabry) Ser. No. *1946–3*

(G.W.H. Norman)

107. **SYENITE PORPHYRY.** Chonolith satellitic to the Coryell batholith, and cutting the Rossland volcanic rocks; just north of the International Boundary slash at Monument 169, in the vicinity of Coryell, Similkameen district, B.C.

82–E–E½ (Anal. M.F. Connor) Ser. No. *1912–61*

Light grey rock with abundant phenocrysts of soda orthoclase, andesine, biotite, and augite. Feldspar phenocrysts are characteristically glassy and occur in thick tabular Carlsbad twins. Andesine phenocrysts are often surrounded by a thick shell of orthoclase. Biotite occurs in lustrous, highly idiomorphic, black foils, and diopsidic augite in idiomorphic stout prisms. The groundmass is a fine-grained hypidiomorphic granular aggregate of orthoclase, a little oligoclase, considerable interstitial quartz, and accessory titanite, titaniferous magnetite, and apatite.

R.A. Daly (1912, p. 364)

108. **GRANODIORITE.** One-hundred-foot-wide band of the Bass Creek batholith, between 10 and 20 feet of a contact with small masses of country gneiss, 300 feet below the falls at the outlet of Bass Creek on Georgian Bay, Parry Sound district, Ont.

41–H–E½ (Anal. R.J.C. Fabry) Ser. No. *1931–6*

Sheared porphyritic texture with phenocrysts of oligoclase-albite (Ab_{90} An_{10}) with irregular suture-like borders enclosed by lines and streaks of dark minerals (biotite, magnetite, and garnet) and fine grains of colourless minerals (quartz and orthoclase). Quartz occurs in equidimensional water-clear grains in the groundmass. Orthoclase occurs as interlocking grains with quartz, and also as sort of sheet-like metaperthite between cleavage planes of the plagioclase. (M)

(T.T. Quirke)

109. **GRANODIORITE.** Southern extremity of the Bayonne batholith; vicinity of the Bayonne mine, north of Summit Creek, Selkirk Mountain system, Kootenay district, B.C.

82–F–E½ (Anal. M.F. Connor) Ser. No. *1912–44*

Notably homogeneous, light grey to pinkish grey, medium-to fairly coarse grained rock composed of quartz, microperthite, orthoclase, hornblende, augite, and biotite, and accessory crystals and aggregates of magnetite, well-crystallized titanite and apatite, a few small zircons, and rare crystals of allanite. Secondary kaolin and yellow epidote are occasionally seen. Microperthite is the dominant feldspar and often has double lamellation of microcline microperthite. (M)

R.A. Daly (1912, p. 291)

110. **TINGUAITE.** Sheet rock exposed in the hornstone about the centre of the east face of the mountain on a wood road about ¼ mile east of the main contact of the intrusion and the sediments, St. Hilaire Mountain, Rouville co., Que.

31–H–W½ (Anal. ?) Ser. No. *1914–11*

Fine-grained, bluish green rock, studded with phenocrysts of a pea-green mineral with good crystal faces and octagonal outline, which has not been

	111	112	113	114	115
SiO_2	58.79	58.47	58.36	57.75	57.35
Al_2O_3	16.21	16.60	18.38	17.50	16.04
Fe_2O_3	1.98	1.57	5.53	2.92	4.73
FeO	3.70	3.45	5.30	2.94	4.81
MgO	3.32	2.41	2.60	1.70	2.98
CaO	6.06	5.64	7.20	3.86	5.76
Na_2O	4.67	4.60	3.15	5.08	2.76
K_2O	3.13	5.73	1.98	3.51	3.16
H_2O+	0.57	) 0.45	0.80	) 0.37	0.28
H_2O-	0.07		0.10		0.05
TiO_2	0.53	0.60	0.54	1.53	0.88
P_2O_5	0.38	0.29	0.12	1.05	0.73
MnO	0.12	0.05	0.14	0.19	0.04
CO_2	0.03		0.13	0.55	trace
S		0.24			0.28
Cl		0.02			
SrO		0.05	trace		
BaO		0.19	0.10	0.07	0.18
FeS_2				0.21	
Total	99.56	100.54 (100.36)	99.43 (104.43)	99.23	100.03
Less O≡ S, Cl		0.09			0.11
		100.45 (100.27)			99.92
Sp.gr.	2.78				

NORMS

	111	112	113	114	115
QTZ	3.42	–	11.30	6.05	12.59
CO	–	–	–	.76	–
OR	18.54	33.44	11.53	21.08	19.06
AB	41.94	35.02	27.83	46.27	25.24
AN	14.00	7.56	29.67	12.84	22.43
LC	–	–	–	–	–
NE	–	3.40	–	–	–
KP	–	–	–	–	–
AP	.79	.59	.24	2.22	1.55
RU	–	–	–	–	–
IL	.73	.82	.73	2.16	1.24
PY	–	.61	–	.21	.74
HE	–	–	–	–	–
MT	2.06	1.61	5.68	3.09	5.02
EN	9.24	–	7.12	4.80	8.44
FS	3.79	–	3.75	.69	2.54
OL	–	1.41	–	–	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	15.48	–	–	–
WO	5.45	–	2.10	–	1.10

identified. Microcrystalline, inequigranular, containing fairly common apatite in well rounded laths, abundant minute prisms of aegerite, abundant irregular laths of plagioclase of composition basic oligoclase to acid andesine, common larger crystals of orthoclase, a few crystals of colourless eudialyte, a colourless unknown mineral, and blue hornblende. Groundmass is granophyric with trachytic structure.

J.J. O'Neill (1914, p. 61)

111. **HORNBLENDE SYENODIORITE (SYENODIORITE).** Lacorne massif; Lacorne tp., rge. 7, south end of lot 62, Abitibi co., Que.

32–C–W½ (Anal. J.A. Maxwell) Ser. No. *1955–27*

Plagioclase, some of which shows zoning, is clouded by zoned kaolinite and clinozoisite alteration products. Microcline is unaltered and interstitial. Hornblende is unaltered, dark green, and contains inclusions of sphene and quartz. Clinozoisite, sphene, apatite, pyrite, and hematite are present in accessory amounts. (M)

(K.R. Dawson)

112. **GRANITE.** Triangulation station on the summit of Lake Mountain, Trail Creek mining division, West Kootenay district, B.C.

82–F–W½ (Anal. N.L. Turner) Ser. No. *1915–33*

C.W. Drysdale (1915b, p. 33)

113. **QUARTZ DIORITE.** In stocks and apophyses of the large batholith; base of Stemwinder hill, Hedley mining district, B.C.

92–H–E½ (Anal. M.F. Connor) Ser. No. *1910–12*

Light to dark grey, medium-grained rock of granitic texture. Dominant feldspar is plagioclase ($Ab_{55}An_{45}$), characteristically zoned. It tends to be idiomorphic, and is largely unaltered. Orthoclase is present in variable proportions and is slightly more decomposed. Quartz is always interstitial and constitutes less than 15%. Unaltered green hornblende is the most abundant coloured constituent. Biotite, generally included in or adjacent to hornblende and frequently rimmed by secondary magnetite, titanite, calcite, magnetite, arsenopyrite, epidote, and zircon are accessory minerals.

C.Camsell (1910, p. 77)

114. **AKERITE.** Narrow border phase and also detached area of intrusion of Mount Yamaska, Rouville co., Que.

31–H–E½ (Anal. G.A. Young) Ser. No. *1904–1*

Medium- to coarse-grained, holocrystalline, massive, light grey or greenish grey rock consisting of the following minerals in order of decreasing proportion: abundant plagioclase feldspar individuals of varying size whose centres correspond to andesine, large irregular individuals of alkali feldspar, brown biotite associated with pyroxene, quartz, aggregates of small, pale green rounded grains of pyroxene, iron ore, a few small grains of pyrite, a small amount of yellow titanite, small stout prisms of colourless apatite, a few small zircons, small amounts of calcite, kaolin, and other secondary minerals.

G.A. Young (1906, p. 16)

115. **SYENODIORITE.** One thousand, two hundred feet along the tote road west of the camp on Beef Tea Creek at its outlet on Crombie Bay, Georgian Bay, Parry Sound district, Ont.

41–I–E½ (Anal. R.J.C. Fabry) Ser. No. *1930–9*

Massive, grey rock of uniform grain and indefinite structure. Porphyritic phases interlay fine dense, pink gneiss. Consists of large grains of orthoclase and plagioclase with associated skeletal brown biotite, dark green amphibole, magnetite, and apatite. (M)

(T.T. Quirke)

116. **PULASKITE PORPHYRY.** Sills and dykes common in the Phoenix area, Boundary district, southern B.C.

82–E–E½ (Anal. M.F. Connor) Ser. No. *1912–20*

Grey, porphyritic rock consisting essentially of clusters and sparsely scattered phenocrysts of twinned and untwinned feldspar and a few of almost completely altered augite and biotite in a feldspathic base, with additional hornblende, biotite, quartz, magnetite, apatite, and chlorite. Magnetite is the prominent accessory. Plagioclase ranges from oligoclase to acidic andesine, and larger individuals are surrounded by a rim of clear orthoclase. Soda orthoclase is turbid in the centre usually with a clear exterior zone.

O.E. LeRoy (1912, p. 51)

117. **QUARTZ DIORITE.** Intrusive into the Kisseynew sedimentary gneisses; east of Bartlett Lake, Kississing area, Man.

63–N–W½ (Anal. R.B. Ellestad) Ser. No. *1930–31*

Black, massive, fresh-appearing, medium-grained rock containing essential andesine, hornblende, and some quartz. (M)

J.F. Wright (1931, p. 19)

118. **DIORITE (GABBRO).** Stock-like mass intrusive into slates; Middle Creek, Yale district, B.C.

92–H–W½ (Anal. M. Dittrich) Ser. No. *1912–81*

Dark brownish to greenish grey, fresh rock, generally not crushed or greatly strained, and medium-grained except near intrusive contacts where it is fine grained. Essential minerals are acidic labradorite, hornblende, and biotite. Hornblende in places encloses small cores of nearly

	116	117	118	119	120
SiO_2	57.32	56.91	56.90	56.62	56.58
Al_2O_3	17.27	17.67	18.17	16.66	16.66
Fe_2O_3	1.62	1.63	1.23	3.86	1.98
FeO	3.94	5.30	5.88	3.55	4.34
MgO	2.68	4.55	4.36	3.08	4.41
CaO	4.24	7.15	6.51	6.34	6.75
Na_2O	4.52	3.12	3.23	4.05	4.70
K_2O	5.96	1.25	1.57	4.46	2.42
H_2O+	0.47	1.33	0.77	0.60	0.80
H_2O-	0.08	0.06	0.12		0.06
TiO_2	0.88	0.67	0.84	0.60	0.60
P_2O_5	0.51		0.10	0.14	0.33
MnO	0.09		0.21	0.02	0.13
CO_2			0.08		0.04
S				0.31	
Cl				0.11	
SrO	0.06		0.18	0.24	
BaO	0.24			0.09	
Total	99.88	99.64	100.15	100.63 (100.73)	99.80
Less O≡ S, Cl				0.14	
				100.49 (100.59)	
Sp.gr.			2.793		

	NORMS				
	116	117	118	119	120
QTZ	–	9.09	7.49	–	.36
CO	–	–	–	–	–
OR	35.04	7.52	9.36	25.07	14.28
AB	35.66	28.49	29.22	32.05	42.05
AN	9.12	31.03	30.66	13.36	17.13
LC	–	–	–	–	–
NE	2.78	–	–	1.48	–
KP	–	–	–	–	–
AP	1.06	–	.21	.27	.68
RU	–	–	–	–	–
IL	1.21	.94	1.17	.79	.83
PY	–	–	–	.76	–
HE	–	–	–	–	–
MT	1.67	1.73	1.29	3.82	2.05
EN	–	12.88	12.22	–	12.23
FS	–	6.23	7.45	–	4.68
OL	5.45	–	–	8.57	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	7.97	–	–	13.79	–
WO	–	2.04	.87	–	5.65

colourless augite, which also occurs in small independent anhedra. Other accessories are quartz, magnetite, pyrite, apatite, and titanite. Structure is hypidiomorphic granular. (M)

R.A. Daly (1912, p. 533)

119. **GRANODIORITE.** Nelson batholith, generally in the form of stocks; 1,100 feet level west, Centre Star mine, Rossland Mining Camp, Trail Creek Mining Division, West Kootenay district, 6 miles west of the Columbia River and 5 miles north of the International Boundary, B.C.

82–F–W½ (Anal. N.L. Turner) Ser. No. *1915–31*

Medium-grained, light grey crystalline rock, composed of orthoclase, andesine, and microcline, quartz, hornblende, and biotite.

C.W. Drysdale (1915b, p. 28)

120. **HORNBLENDE SYENODIORITE (SYENODIORITE).** Lacorne massif; Vassan tp., rge. 9, west end of lot 55, Abitibi co., Que.

32–C–W½ (Anal. J. Hitchins, J.A. Maxwell) Ser. No. *1955–30*

Weakly foliated rock containing no visible quartz. Plagioclase occurs in subhedral crystals with areas clouded by sericite and clinozoisite, some weak and diffuse. Quartz and microcline are unaltered and interstitial. Hornblende is dark green and lightly altered with inclusions of quartz and sphene and a few bleached areas. Clinozoisite, biotite, sphene, apatite and zircon are present in accessory quantities. (M)

(K.R. Dawson)

121. **AUGITE PORPHYRITE.** Dykes, sills, and stocks cutting all the older formations; Phoenix, Boundary district, B.C.

82–E–E½ (Anal. M.F. Connor) Ser. No. *1912–19*

Dark rock consisting of phenocrysts of dark grey feldspar, dark brown to black pyroxene and hornblende, and black biotite, in a fine-grained base composed of the above minerals. The feldspars occur either singly or in clusters of large and small tabular, lath-shaped and square forms and irregular individuals. Plagioclase (andesine labradorite) predominates over orthoclase. Augite is pale yellow and occurs in sharp and rounded forms and as irregular individuals. The base is microcystalline in great part and largely feldspathic. Quartz in a small amount, magnetite, and apatite complete the list of minerals.

O.E. LeRoy (1912, p. 49)

122. **TINGUAITE** (?). Third intrusion, Brome Mountain, Brome co., Que.

31–H–E½ (Anal. M.F. Connor) Ser. No. *1902–29*

Greenish grey, porphyritic rock with phenocrysts of feldspar in a felsitic base. Phenocrysts are plagioclase, pure orthoclase, or mostly cryptoperthite. Areas of granular, feldspathic material are numerous and prominent

	121	122	123	124	125
SiO_2	55.90	55.68	55.62	55.39	55.20
Al_2O_3	15.52	20.39	15.64	11.90	23.13
Fe_2O_3	1.22	2.10	1.85	0.90	1.09
FeO	5.22	1.95	5.63	4.71	2.69
MgO	4.70	0.80	3.68	3.67	3.13
CaO	5.79	1.92	5.92	7.63	9.47
Na_2O	2.89	9.18	1.37	1.99	3.42
K_2O	4.45	5.34	8.56	4.30	1.18
H_2O+	1.40	} 1.50	} 0.35	6.08	0.36
H_2O-	0.60			0.26	0.04
TiO_2	0.90	0.60	0.88	1.24	0.21
P_2O_5	0.46	0.06	0.29		0.18
MnO	0.08	0.31	0.03		trace
CO_2	0.14			2.12	0.09
S			0.30		0.15
Cl			0.02		
SrO	0.09		0.14		
BaO			0.11		0.06
Total	99.36	99.83	100.58 (100.39)	100.19	100.40
Less O≡S, Cl, F			0.11		0.06
			100.47 (100.28)		100.34

NORMS

	121	122	123	124	125
QTZ	2.47	–	–	8.88	4.66
CO	–	–	–	–	–
OR	27.00	30.57	50.92	28.02	6.90
AB	26.59	28.77	12.35	19.66	30.33
AN	16.60	–	11.23	11.89	43.73
LC	–	–	–	–	–
NE	–	28.94	–	–	–
KP	–	–	–	–	–
AP	.98	.12	.60	–	.37
RU	–	–	–	–	–
IL	1.28	.80	1.23	1.89	.28
PY	–	–	.78	–	.38
HE	–	–	–	–	–
MT	1.30	1.31	1.93	1.03	1.12
EN	13.40	–	.17	11.24	8.60
FS	6.24	–	.09	5.42	2.81
OL	.23	.23	6.51	–	–
AC	–	2.14	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	7.07	14.13	–	–
WO	4.10	–	–	11.93	.75

in the cryptocrystalline part of the base. Granular ferromagnesian minerals are also found in some of these aggregates with small amounts of magnetite, apatite, chlorite, and a few individuals of biotite. Bluish sodalite also occurs.

J.A. Dresser (1903, p. 317)

123. **DIORITE PORPHYRITE.** Irregular tongue-like forms of the border and dyke facies of granodiorite batholith; hanging-wall of No. 895 stope, Le Roi mine, Rossland Mining Camp, Trail Creek Mining Div., West Kootenay district, 6 miles west of the Columbia River, 5 miles north of the International Boundary, B.C.

82–F–W½ (Anal. N.L. Turner) Ser. No. *1915–32*

Light grey to dark greenish rock composed of numerous dark, slender prisms of hornblende and many lath-like feldspars lying in a fine crystalline greyish groundmass. Hornblende and feldspars occur as distinct phenocryst and there are two distinct gradational phases, hornblende and feldspar.

C.W. Drysdale (1915b, p. 28)

124. **MINETTE.** Lamprophyre dyke intrusive in Abitibi volcanic rocks; interior of the peninsula that juts into Lake Dufresnoy, Dufresnoy tp., Abitibi co., Que.

32–D–W½ (Anal. S.J. Lloyd) Ser. No. *1914–3*

Essential constituents are orthoclase, plagioclase, biotite, and carbonate. Secondary minerals are chlorite, sericite, sphene, and iron oxide.

M.E. Wilson (1913, p. 50)

125. **GABBRO.** Pickerel batholith; near the middle of the band on the western side of the syncline between Pickerel River outlet and Canoe Channel, collected from the north side of Pickerel River, Georgian Bay, Parry Sound district, Ont.

41–H–E½ (Anal. R.J.C. Fabry) Ser. No. *1931–27*

Less sheared, hornblendic phase of the gabbro. The contact with the gneisses it intrudes is fingered, and border facies give rise to several types of rocks. (M)

(T.T. Quirke)

126. **AUGITE SYENITE.** Irregular-shaped intrusive mass; Maple Leaf property, due north of Grand Forks and 37 miles from the International Boundary, Franklin mining district, B.C.

82–E–E½ (Anal. Mines Branch) Ser. No. *1915–11*

Medium grey, phanerocrystalline, medium-grained, dominantly feldspathic, rock of trachytoid texture and granular fabric. Essential constituents

	126	127	128	129	130	131
SiO_2	55.16	55.13	55.11	54.87	54.74	54.60
Al_2O_3	17.30	23.76	21.28	12.59	21.53	16.31
Fe_2O_3	3.58	0.57	2.64	3.43	4.06	2.36
FeO	2.81	2.46	1.29	8.47	0.94	6.88
MgO	1.88	2.54	0.59	3.29	0.18	4.23
CaO	4.80	9.00	2.82	9.27	0.90	3.54
Na_2O	3.03	3.59	6.24	2.02	12.84	2.20
K_2O	8.73	1.37	8.36	1.09	4.18	2.25
H_2O+	)1.40	0.69	0.58	1.16	)0.35	4.30
H_2O-		0.06	0.14	0.20		0.55
TiO_2	0.36	0.27	0.48	2.56	trace	2.00
P_2O_5		0.32	0.27	1.51		0.18
MnO	0.08		0.08		0.14	0.07
CO_2	1.40	0.13	0.08	nil		
FeS_2						0.30
Fe_7S_8						0.08
Total	100.53	99.89	99.96	100.46	99.86	99.85
Sp. gr.			2.666	2.86	2.68	

NORMS

	126	127	128	129	130	131
QTZ	–	4.81	–	17.16	–	15.93
CO	–	.80	–	–	–	3.50
OR	52.64	8.08	48.28	6.77	23.11	14.36
AB	12.99	32.11	14.35	19.03	21.02	21.29
AN	7.89	42.47	5.17	23.15	–	21.39
LC	–	–	–	–	–	–
NE	8.82	–	24.17	–	39.34	–
KP	–	–	–	–	–	–
AP	–	.66	.55	3.31	–	.40
RU	–	–	–	–	–	–
IL	.51	.37	.65	3.73	–	3.00
PY	–	–	–	–	–	–
HE	–	–	.37	–	–	–
MT	3.80	.59	2.12	3.75	–	2.65
EN	–	7.04	–	9.61	–	10.62
FS	–	3.02	–	7.50	–	6.81
OL	.20	–	–	–	.26	–
AC	–	–	–	–	10.55	–
NSI	–	–	–	–	2.35	–
KSI	–	–	–	–	–	–
DI	13.11	–	3.20	–	3.34	–
WO	–	–	1.10	5.93	–	–

are alkalic feldspar, frequently with Carlsbad twinning; much cracked and broken, very pale green diopside; dark green hornblende occurring together with the pyroxene, both in stout, well-shaped crystals. Accessory minerals are iron ore occurring in small and large grains and surrounded usually by narrow mantles of biotite, diamond- and wedge-shaped crystals of titanite, apatite, scattered shreds of biotite, and melanite garnet. Secondary constituents are chlorite and kaolin. The presence of a trace of nephelite was indicated. (M)

C.W. Drysdale (1915a, p. 107)

127. **GABBRO.** Hornblendic phase of the Pickerel gabbro batholith intrusive into gneisses; north side of the Pickerel River, near the middle of the band on the western side of the syncline, between Pickerel River outlet and Canoe Channel, Georgian Bay, Ont.

41–H–E½ (Anal. T. Kameda) Ser. No. *1931–29*

The contact with the gneisses it intrudes is fingered, and border facies give rise to several types of rocks.

(T.T. Quirke)

128. **NEPHELITE SYENITE.** Specially large, relatively homogeneous mass; on a ledge 2,300 yards due west of the southern end of the lake on the top of the Kruger Mountain plateau, and 1.5 miles north of the International Boundary, B.C.

82–E–E½ (Anal. M. Dittrich) Ser. No. *1912–72*

Light bluish grey, rather fine-grained, leucocratic phase of the body. Abundant olive-green, strongly pleochroic hornblende. Biotite is scarcely more than accessory. Nephelite, orthoclase, microperthite, microcline, and probably soda orthoclase are the light coloured essential minerals. Melanite, apatite, and titanite are accessory. Rock is fresh, little crushed. Nephelite shows little alteration.

R.A. Daly (1912, p. 451)

129. **INTERMEDIATE ROCK.** Intermediate zone of Sudbury irruptive; in the neighbourhood of the boundary of Snider and Creighton tps., Sudbury district, Ont.

41–I–W½ (Anal. T.C. Phemister) Ser. No. *1932–40*

Most basic variety of the intermediate zone, resembling the acid part of the basic member, but finer grained and less uniform in texture. Calcic plagioclase has tendency to form prismatic crystals, is brownish, with marked zoning and considerable replacement on margins by quartz. Alteration to epidote and white mica is wiaespread. Quartz and microperthite form micropegmatitic intergrowths radiating from zoned plagioclase crystals. Amphibole is blue-green to yellow-brown. Epidote is an important

	132	133	134	135	136
SiO_2	54.49	54.46	54.40	54.34	54.30
Al_2O_3	16.51	14.21	19.05	16.90	3.70
Fe_2O_3	2.79	2.07	3.55	1.65	
FeO	5.20	6.60	2.86	6.76	2.07
MgO	3.55	8.44	2.56	4.51	23.61
CaO	7.06	8.84	6.96	1.29	10.39
Na_2O	3.50	2.53	3.88	8.02	
K_2O	4.36	2.09	5.34	0.55	
H_2O+	1.18	3.25	0.66	4.22	
H_2O-	0.07	0.09	0.04	0.18	
TiO_2	0.70	0.71	0.30	1.24	
P_2O_5	0.20		0.36	0.12	
MnO	0.10	0.12			
CO_2	0.10	0.35			
S	0.23		0.02		
F			0.11		
CuO	nil				
volatile					5.43
Total	100.04	99.76 (103.76)	100.09	99.78	99.63 (99.50)
Less O≡ S, F	0.09		0.05		
	99.95		100.04		
Sp.gr.					3.003

NORMS

	132	133	134	135	136
QTZ	–	.70	–	–	3.60
CO	–	.00	–	1.15	–
OR	26.06	12.28	31.54	3.29	–
AB	31.72	22.55	27.00	67.75	–
AN	16.58	21.07	18.70	5.69	10.17
LC	–	–	–	–	–
NE	–	–	4.64	3.07	–
KP	–	–	–	–	–
AP	.42	–	.75	.25	–
RU	–	–	–	–	–
IL	.98	.98	.41	1.74	–
PY	.60	–	.05	–	–
HE	–	–	–	–	–
MT	2.93	2.14	3.69	1.74	–
EN	1.99	23.32	–	–	66.24
FS	.98	7.90	–	–	3.22
OL	3.68	–	2.41	15.28	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	14.01	–	10.76	–	–
WO	–	9.01	–	–	16.75

constituent as an alteration product and as a component of hornblende-biotite intergrowth. Titanite forms spherules with a grain of ilmenite at the centre.

(T.C. Phemister)

130. **NEPHELITE SODALITE SYENITE (SYENODIORITE).** Southeast face of the hill at the southeastern end of St. Hilaire Mountain, Rouville co., Que.

31–H–W½ (Anal. M.F. Connor) Ser. No. *1914–9*

Large greenish grey phenocrysts of feldspar and feldspathoid occur in a fined-grained groundmass of minute crystals of feldspar and aegerite, and larger grains of aegerite. Albite occurs in laths in all stages of growth up to 1.5 mm, in small crystals included in all other minerals, and in intergrowths with nephelite and sodalite. Nephelite forms abundant, fresh phenocrysts. Sodalite is free from inclusions, and occurs in both large and small crystals. Light pink to colourless eudialyte, irregular laths of orthoclase, and a few small crystals of lavenite-like mineral are also present. (M)

J.J. O'Neill (1914, p. 40)

131. **DIABASE.** Dyke over 200 feet wide, Pyritic Island, Sibley tp., Thunder Bay district, Ont.

52–A–E½ (Anal. M.F. Connor) Ser. No. *1931–19*

Grey, medium-grained diabase traversed by irregular seams rich in feldspar, which stand out on the weathered surface. Contains several tiny quartz calcite veinlets.

T.L. Tanton (1931, p. 74)

132. **MONZONITE.** Rossland monzonite body, surrounded by carboniferous sediments and associated augite porphyrite; Le Roi mine, Rossland, Kootenay district, B.C.

82–F–W½ (Anal. M.F. Connor) Ser. No. *1912–55*

Coarse, dark rock of which augite and hornblende, lying in both large and small, often ragged, prisms form the bulk. Dark brown biotite is abundant and forms large irregular flakes. Feldspars, usually white or slightly greenish, lie between the prisms of augite and hornblende and are chiefly labradorite, with interstitial orthoclase in subordinate amount.

R.A. Daly (1912, p. 343)

133. **QUARTZ NORITE.** Sill, Frechette tp., Sudbury district, Ont.

41–P–W½ (Anal. M.F. Connor) Ser. No. *1917–2*

Light coloured rock, merging gradually into the surrounding diabase from which it differs in being considerably lighter in colour, richer in feldspar, and much coarser. Texture like quartz diabase, constituents the same except that slightly more than half the pyroxene is hypersthene, the remainder is augite.

W.H. Collins (1917, p. 89)

134. SYENODIORITE MONZONITE (?). Intermediate zone of the Copper Mountain stock, 100 yards south of the pumping station in Similkameen Canyon, Similkameen district, B.C.

92–H–E½ (Anal. ?) Ser. No. *1934–27*

The stock varies from a syenogabbro at the outer margin to a central core of nearly pure feldspar. The intermediate zone varies from a medium coarse- to coarse-grained rock with crystals averaging between ¼ and ⅛ inch long. The composition ranges from a syenodiorite having 25% orthoclase, 15% oligoclase, and 15% augite, to a rock approaching a monzonite and consisting of 35% orthoclase, 55% albite oligoclase (Ab_{85}-An_{15}), and 7% augite, the remainder consisting of biotite, hornblende, and magnetite. Outstanding peculiarities of all phases are the absence of both quartz and feldspathoids, the great number of large apatite crystals, and the association of abnormal amounts of orthoclase with the gabbro and diorite phases.

V. Dolmage (1934, p. 13) *See also* Nos. 90, 102, 161, 196 *(1934–28, 29, 26, 25)*

135. APLITE. Dyke cutting quartz diabase sill; Lett property, Wapus Creek, Tyrrell tp., Timiskaming district, Ont.

41–P–E½ (Anal. M.F. Connor) Ser. No. *1913–28*

Dykes have poorly defined walls, and vary from a dingy red basic phase consisting of red feldspar and abundant mica to a nearly pure white acid phase consisting wholly of white feldspars and quartz. Average section consists of a fine-grained mosaic of plagioclase, quartz, and mica grains. Plagioclase approaches albite, may be irregularly intergrown with quartz. Yellow-brown pleochroic mica, generally decomposed to chlorite, is present. Rounded grains of titanite, slender rods of apatite, and irregular grains of chalcopyrite and pyrite are also found. Calcite and black iron ore are sometimes present.

W.H. Collins (1913, p. 76) *See also* No. 152 *(1913–27)*

136. PYROXENIC ROCK. North Burgess, Lanark co., Ont.

31–C–E½ (Anal. T.S. Hunt) Ser. No. *1863–37*

Encloses loganite, resembles it in colour and cleavage, has a greater hardness.

Geological Survey (1863, p. 492)

	137	138	139	140	141
SiO_2	54.10	54.06	53.68	53.42	53.32
Al_2O_3	18.70	18.75	16.89	21.04	14.16
Fe_2O_3		4.64	1.28	1.74	2.15
FeO	9.18	3.10	5.53	2.83	5.08
MgO	4.97	2.75	3.70	0.61	7.90
CaO	3.58	7.35	6.08	2.88	7.12
Na_2O	4.51	4.60	4.03	7.80	2.39
K_2O	1.10	3.00	4.32	7.48	4.80
H_2O+		0.41	1.85	0.76	1.24
H_2O-		0.10	0.10	0.04	0.26
TiO_2		0.80	0.90	0.60	0.90
P_2O_5		0.55	1.05	0.10	0.66
MnO		trace	0.11	0.07	0.10
CO_2		0.11		0.43	
S				trace	
SO_3				0.06	
Cl				0.10	
SrO			0.10		0.05
BaO			0.38		0.12
volatile	3.60				
Total	99.74	100.22	100.00	99.96	100.25
Less O≡ Cl				0.02	
				99.94	
Sp.gr.		2.819	2.723	2.609	2.831

NORMS

	137	138	139	140	141
QTZ	.87	–	–	–	–
CO	3.98	–	–	–	–
OR	6.67	17.72	25.85	42.98	28.48
AB	41.49	41.20	34.75	10.01	21.50
AN	18.23	21.57	15.36	.24	13.72
LC	–	–	–	–	–
NE	–	–	1.08	34.76	–
KP	–	–	–	–	–
AP	–	1.14	2.22	.20	1.38
RU	–	–	–	–	–
IL	–	1.22	1.26	.81	1.25
PY	–	–	–	–	–
HE	–	–	–	–	–
MT	–	4.83	1.34	1.76	2.24
EN	14.17	2.57	–	–	5.76
FS	14.54	.11	–	–	1.37
OL	–	.58	9.60	–	9.64
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	9.01	8.50	8.03	14.60
WO	–	–	–	1.19	–

137. **DIORITE.** West side of Esquimalt Harbour, Vancouver Island, B.C.

92–B–W½ (Anal. T. S. Hunt) Ser. No. *1871–2*

Fine-grained, somewhat calcareous.

J. Richardson (1872, p. 100)

138. **SYENITE (SYENODIORITE).** Wide zone of basification of Similkameen granite batholith at the contact with the Druger alkaline body; 2 miles north of the International Boundary about 200 yards from the contact, west of the Similkameen River, Similkameen district, B.C.

82–E–W½ (Anal. M. Dittrich) Ser. No. *1912*–77

Quartz nearly or altogether disappears, biotite is absent, and abundant diopsidic augite accompanies the essential hornblende. The feldspars are the same as in the staple rock of the batholith – basic oligoclase and the alkaline feldspars, microperthite, microcline, microcline-microperthite, and orthoclase, but with more abundant basic oligoclase. Zircon, magnetite, apatite, titanite, and rare allanite are accessory. (M)

R.A. Daly (1912, p. 457)

139. **HORNBLENDE AUGITE MINETTE.** Chilled zone of 10-foot dyke cutting granite porphyry mass, which in turn cuts intensely crumpled Pend d'Oreille phyllites; western bank of the Columbia River, a few hundred feet south of the International Boundary, B.C.

82–F–W½ (Anal. M.F. Connor) Ser. No. *1912–47*

Dark greenish grey to dark ash-grey, fine-grained rock with occasional phenocrystic foils of biotite and many minute prisms of augite and green hornblende, embedded in a very fine grained paste of sodiferous orthoclase and oligoclase, minute biotite and augite crystals, accompanied by abundant titanite, apatite, interstitial quartz, and a small amount of ilmenite. Shows very marked chilling along both walls. Very fresh.

R.A. Daly (1912, p. 310)

140. **NEPHELITE SYENITE (SYENITE).** Dominant type of the leucocratic phase of the Ice River alkaline intrusive complex; outcrops over an area of 12 square miles centred about the Ice River Valley, Kootenay district, B.C.

82–N–E½ (Anal. M.F. Connor) Ser. No. *1914–26*

Typically a coarse-grained, greenish grey rock with a mottled appearance, with variations in texture and mineral composition within a few feet. Hypidiomorphic, inequigranular, fresh, consisting essentially of orthoclase and albite, and a small amount of nephelite with which are associated subordinate amounts of pyroxene and amphibole as well as accessory magnetite, apatite, sodalite, microcline, zircon, melanite, almandine, and corundum. Biotite and perovskite are rare or absent.

J.A. Allan (1914, p. 136)

141. AUGITE MINETTE. A 60-foot dyke cutting biotite-spangled and garnetiferous mica schist of Belt F of the Priest River terrane; on the summit of the ridge 2 miles east-northeast from the peak of North Star Mountain at the International Boundary, Selkirk Mountain system, B.C.

82–F–E½ (Anal. M.F. Connor) Ser. No. *1912–46*

Dark greenish to slate-grey, porphyritic rock with conspicuous lustrous phenocrysts of brown biotite measuring 5 mm or less across the foils and more abundant idiomorphic prisms of a nearly colourless, diopsidic augite measuring from 0.5 to 1.5 mm. Groundmass is a fine-grained, hypidiomorphic granular aggregate of minute augite and biotite crystals with abundant orthoclase. Apatite, magnetite, and a little quartz, between the feldspars, are primary accessories. Orthoclase is somewhat kaolinized and chlorite, epidote, and calcite have developed secondarily.

R.A. Daly (1912, p. 307)

142. PORPHYRITIC AUGITE OLIVINE SYENITE (SYENITE). Stock-like body, intrusive into crystalline limestone and schists of the Sutherland Complex; from railway cuttings just south of the point where the Crowsnest line of the Canadian Pacific Railway turns out of McRae Creek valley and enters that of Christina Lake, B.C.

82–E–E½ (Anal. M.F. Connor) Ser. No. *1912–58*

Fresh, dark grey to greenish or bluish grey, medium-grained to rather coarse-grained aggregate of augite, olivine, biotite, plagioclase, and orthoclase and having enormous phenocrystic foils of dark green biotite with very marked magmatic corrosion. Olivine is abundant, and very fresh. It is slightly serpentinized along some cracks. Augite is a diopsidic occurring in stout prisms. Plagioclase (labradorite) and orthoclase are fresh, and much smaller than the augite. Titaniferous magnetite and apatite are abundant accessories. (M)

R.A. Daly (1912, p. 357)

143. SYENITE. Kruger alkaline body, northwest of the small lake on the top of the Kruger Mountain plateau, Similkameen district, B.C.

82–E–W½ (Anal. M. Dittrich) Ser. No. *1912–71*

Bluish grey, medium-grained, somewhat porphyritic rock, with phenocrysts of microperthite in crystals 1 cm or more long. Essential minerals are biotite, nephelite, microperthite, microcline, and a little free albite. Apatite, titaniferous magnetite or ilmenite, and titanite are primary accessories. Abundant melanite interpenetrated intimately with biotite may be primary. A little hydronephelite and more abundant muscovite are secondary. (M)

R.A. Daly (1912, p. 451) *See also* No. 164 *(1912–70)*

	142	143	144	145	146
SiO_2	52.95	52.53	52.43	52.38	52.31
Al_2O_3	14.00	19.05	19.18	15.29	16.22
Fe_2O_3	2.57	4.77	3.51	2.99	0.67
FeO	5.55	2.10	2.08	5.53	8.36
MgO	7.29	1.99	2.61	5.84	3.66
CaO	6.93	5.75	3.71	7.30	1.28
Na_2O	2.73	4.03	4.85	3.68	3.47
K_2O	5.09	7.30	5.95	3.84	3.77
H_2O+	0.50	1.49	3.19	0.63	3.89
H_2O-	0.16	0.13	0.27	0.21	0.31
TiO_2	0.70	0.07	0.86	1.10	1.50
P_2O_5	0.47	0.28	0.42	0.75	0.03
MnO	0.13	0.13	trace	0.10	0.06
CO_2		0.27	trace		0.20
C					1.74
SrO	0.11	0.19	0.42	0.15	
BaO	0.32	0.09	0.35	0.25	
NiO					0.04
FeS_2					2.26
Fe_7S_8					0.81
Total	99.50	100.17	99.83	100.04	100.58
Sp.gr.	2.815	2.719	2.608	2.847	

NORMS.

	142	143	144	145	146
QTZ	–	–	–	–	3.96
CO	–	–	–	–	4.97
OR	30.19	43.45	35.80	22.73	24.43
AB	21.08	11.78	24.96	29.03	34.09
AN	10.89	12.33	13.15	13.83	6.74
LC	–	–	–	–	–
NE	2.07	14.74	11.57	2.40	–
KP	–	–	–	–	–
AP	.98	.58	.89	1.56	.06
RU	–	–	–	–	–
IL	.97	.09	1.21	1.53	2.28
PY	–	–	–	–	2.26
HE	–	–	.42	–	–
MT	2.68	5.00	3.07	3.12	.76
EN	–	–	–	–	11.14
FS	–	–	–	–	11.52
OL	12.96	–	3.53	10.15	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	18.13	11.20	5.34	15.62	–
WO	–	.77	–	–	–

144. **RHOMB PORPHYRY.** Rock Creek chonolith, chilled zone; 10 feet from contact of the invaded conglomerate, from a ledge on the northern brink of Rock Creek Canyon, about 2,500 yards upstream from its confluence with Kettle River, Similkameen district, B.C.

82–E–W½ (Anal. M. Dittrich) Ser. No. *1912–66*

Dark bluish grey or slaty grey, very fine grained porphyry. Phenocrysts are chiefly rhomb feldspars, which are glassy and less charged with inclusions and secondary calcite than the feldspar of the central phase. Other phenocrysts are a few augite prisms, hexagonal biotite foils, and a few small serpentinized olivines. The groundmass is hyalopilitic with many minute, acicular augites, thin biotite foils, and feldspar microlites embedded in a somewhat zeolitized glass. Titanite, titaniferous magnetite, and apatite are accessory. Very fresh, with a small amount of serpentine, some minute specks of calcite and zeolite the only secondary products.

R.A. Daly (1912, p. 409) *See also* No. 148 *(1912–64)*

145. **MONZONITE.** Coryell batholith, basified contact; exposed in railway cuttings near Coryell, Similkameen district, B.C.

82–E–E½ (Anal. M.F. Connor) Ser. No. *1912–60*

Rather dark grey, coarse-grained rock strikingly rich in hornblende, diopside and biotite named in order of decreasing abundance. Andesine is the prevailing feldspar, and accompanies orthoclase and microperthite. Accessories are apatite, magnetite, and abundant titanite. Quartz is entirely absent. (M)

R.A. Daly (1912, p. 361) *See also* No. 93 *(1902–26)*

146. **GRAPHITIC GRANOPHYRE.** Complex along the edge of a large mass of Animikie shale included in a diabase dyke; Pyritic Island, Sibley tp., Thunder Bay district, Ont.

52–A–E½ (Anal. M.F. Connor) Ser. No. *1931–20*

Fine- and medium-grained, pink rock consisting of closely packed, club-shaped, vermicular, and branching groups of minerals showing micrographic or irregular intergrowths, with nodules of graphite and fine-grained pyrite and pyrrhotite. Some groups of granophyre consist of quartz and feldspar, others of plagioclase and microcline, or of chlorite, biotite, hornblende, apatite, and magnetite, and some consist of feldspar and probably nepheline dusted with hematite.

T.L. Tanton (1931, p. 74) *See also* Nos. 131, 521 *(1931–19, 18)*

147. **MICA HYPERSTHENE GABBRO.** Thickly wooded hill, Cote St. Pierre, Petite Nation Seignorieu, Papineau co., Que.

31–G–W½ (Anal. M. Dittrich) Ser. No. *1899–5*

	147	148	149	150	151
SiO_2	52.19	51.83	51.76	51.75	51.59
Al_2O_3	14.52	18.25	16.71	17.47	15.11
Fe_2O_3	3.19	4.26	2.58	2.96	3.34
FeO	6.21	1.46	5.37	9.16	5.14
MgO	6.57	3.28	5.09	5.20	8.92
CaO	8.88	4.08	7.30	9.40	11.88
Na_2O	3.65	4.68	4.09	1.37	0.82
K_2O	1.53	5.75	4.04	0.43	0.30
H_2O+	0.53	3.15	1.66	0.21	0.75
H_2O-		0.27		0.23	0.39
TiO_2	0.72	0.86	0.27	1.15	0.62
P_2O_5	1.43	0.55		0.34	0.46
MnO	trace	trace	0.10	trace	0.03
CO_2	0.66	0.43	1.76	0.32	nil
S				0.16	0.23
SrO		0.42			
BaO		0.43			
Total	100.08	99.70	100.73	100.15	99.58
Less O = S				0.06	0.09
				100.09	99.49
Sp.gr.		2.621			

NORMS

	147	148	149	150	151
QTZ	.29	–	–	10.09	9.41
CO	–	–	–	–	–
OR	9.12	34.81	24.18	2.62	1.81
AB	33.01	24.33	22.22	12.66	7.51
AN	18.84	12.02	15.43	41.44	37.44
LC	–	–	–	–	–
NE	–	11.17	8.93	–	–
KP	–	–	–	–	–
AP	3.01	1.17	–	.73	.98
RU	–	–	–	–	–
IL	1.00	1.22	.37	1.64	.88
PY	–	–	–	.42	.61
HE	–	1.94	–	–	–
MT	3.35	1.62	2.72	3.18	3.56
EN	18.42	–	–	14.90	25.35
FS	6.42	–	–	10.52	4.50
OL	–	4.19	9.13	–	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	7.47	16.98	–	–
WO	6.47	–	–	1.74	7.91

Coarse-grained rock, showing brownish, unaltered plagioclase in the form of short broad laths, abundant black mica and dark pyroxene. Plagioclase is twinned oligoclase-andesine, and contains many inclusions in the form of a fine dust, which are probably titanic iron. Intergrown rhombic and monoclinic pyroxenes, with peripheral augite, show some uralitization. Mica collects into bunches with the dark constituents, and is mostly primary. Apatite, isolated metallic grains, and quartz in very small grains are also present.

A. Osann (1902, p. 62)

148. **RHOMB PORPHYRY.** Central phase of the Rock Creek chonolith, intrusive in oligocene sandstones and conglomerates; from a ledge on the northern brink of Rock Creek Canyon, about 2,500 yards upstream from the confluence with Kettle River, Similkameen district, B.C.

82–E–W½ (Anal. M. Dittrich) Ser. No. *1912–64*

Greenish grey, nearly or quite holocrystalline, fine-grained rock, abundantly charged with phenocrysts of feldspar, augite, biotite, and some olivine in small crystals. The groundmass is composed of a fine-grained aggregate of alkaline feldspars, and numerous microlites of augite and biotite along with some titanite, abundant accessory titaniferous magnetite, and large prisms of apatite. Accessories are calcite, serpentine, and often nephelite generally altered to hydronephelite. About 20% glass occurred in the groundmass. The feldspar is an abnormal anorthoclase, with a high content of barium and strontium, and contains many inclusions of small augite, magnetite, and apatite crystals and granules.

R.A. Daly (1912, p. 405) *See also* Nos. 144,1115 *(1912–65, 66)*

149. **MONZONITE.** Stock-like mass; below Aberill's shaft, due north of Grand Forks, and 37 miles north of the International Boundary, Franklin mining district, B.C.

82–E–E½ (Anal. Mines Branch) Ser. No. *1915–10*

Phanerocrystalline, medium-grained, medium grey rock of equigranular fabric and hypidiomorphic granular structure. Essential constituents are andesine, allotriomorphic orthoclase, microcline, and augite. Accessory minerals are strongly pleochroic, allotriomorphic biotite, rare green hornblende, and quartz associated with orthoclase. Feldspar is slightly dominant over ferromagnesian constituents. Alteration products are chlorite, epidote, kaolin, limonite.

C.W. Drysdale (1915a, p. 104)

150. **QUARTZ DIORITE.** Dufresnoy quartz diorite intruded in Keewatin lavas, and intruded by the Dufault Lake granodiorite stock; from the southeastern part of the large outcrop about the middle of the body, about

	152	153	154	155	156
SiO_2	51.41	51.26	51.20	51.12	51.08
Al_2O_3	14.13	23.78	1.01	16.03	19.77
Fe_2O_3	3.48	1.81	1.28	1.56	trace
FeO	9.25	2.70	6.51	11.91	3.60
MgO	5.54	1.96	16.88	4.56	4.57
CaO	6.40	8.00	19.09	8.75	16.03
Na_2O	3.43	6.72	nil	2.55	2.56
K_2O	1.80	2.16	0.16	1.24	0.28
H_2O+	1.98	0.55	1.15	0.51	0.65
H_2O-	0.12	0.10	0.04	0.10	0.15
TiO_2	1.20	1.66	0.49	1.05	0.45
P_2O_5	0.06		1.30	0.19	0.14
MnO	0.30	0.10	0.03	0.15	0.09
CO_2			1.00	nil	0.32
S			0.14	0.36	
Cl			trace	trace	
SrO					trace
BaO			nil	0.06	trace
NiO			0.09	nil	
CuO			trace		
Cr_2O_3			0.08	nil	
Total	99.10	100.00 (100.80)	100.35 (100.45)	100.14	99.69
Less O≡ S, Cl			0.05 100.30 (100.40)	0.14 100.00	
Sp.gr.		2.77			

NORMS

	152	153	154	155	156
QTZ	–	–	1.51	.98	–
CO	–	–	–	–	–
OR	11.08	12.38	.95	7.49	1.66
AB	32.02	27.92	–	23.36	23.10
AN	18.53	27.41	2.30	29.20	41.84
LC	–	–	–	–	–
NE	–	18.28	–	–	–
KP	–	–	–	–	–
AP	.13	–	2.75	.40	.29
RU	–	–	–	–	–
IL	1.73	2.23	.68	1.49	.62
PY	–	–	.36	.95	–
HE	–	–	–	–	–
MT	3.77	1.82	1.35	1.66	–
EN	12.50	–	47.51	12.95	1.04
FS	8.66	–	8.53	15.79	.41
OL	.23	1.07	–	–	1.12
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	11.30	8.85	–	–	29.86
WO	–	–	34.01	5.68	–

2,000 feet due west of the bend in the Macamic highway, to the south of Duprat Creek and the Amulet Road, Dufresnoy tp., Abitibi co., Que.

32–D–W½ (Anal. R.J.C. Fabry) Ser. No. *1937–4*

A moderately coarse, dark grey rock consisting of crystals of plagioclase ($Ab_{50}An_{50}$) in a matrix of chiefly pyroxene passing into fibrous amphibole. The less abundant constituents are magnetite, quartz, and a very little epidote and zoisite. Extremely fresh.

M.E. Wilson (1941, p. 29)

151. HORNBLENDE PORPHYRY. Sill in Bonanz volcanic rocks; north side of Esperanza Inlet, opposite Steamer Pit, Zeballos, B.C.

92–E–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–7*

J.W. Hoadley (1953, p. 25)

152. DIABASE. Wapus Creek, Tyrrell tp., Timiskaming district, Ont.

41–P–E½ (Anal. M.F. Connor) Ser. No. *1913–27*

Coarse-grained rock consisting of micrographic intergrowth of quartz and acidic plagioclase filling angular spaces among augite and andesine crystals. Titanite is occasionally found within areas of intergrowth.

W.H. Collins (1913, p. 76)

153. ROUVILLITE (GABBRO). Phase of essexite; St. Hilaire Mountain, Rouville co., Que.

31–H–W½ (Anal. M.F. Connor) Ser. No. *1914–8*

Holocrystalline, medium- to coarse-grained, light grey spotted with black, highly feldspathic rock. Constituents in order of crystallization are abundant short prisms of apatite, iron ore, a few irregular grains of titanite, hornblende, an equal amount of augite, plagioclase, and nephelite. Plagioclase is the most abundant mineral. Nephelite occurs interstitially and in intergrowths with feldspar.

J.J. O'Neill (1914, p. 37)

154. PICRITE. South shore of Gwillim Lake, Opemisca map area, Abitibi territory, Que.

32–G–W½ (Anal. R.J.C. Fabry) Ser. No. *1938–9*

Pale green, medium-grained rock with small red orange spots, which may be secondary after feldspar. Here and there narrow bands of pegmatitic material are sparsely developed. Forms band approximately 200 feet north and 10 feet south of a 6-foot wide pegmatitic band.

(G.W.H. Norman)

	157	158	159	160	161
SiO_2	50.89	50.76	50.69	50.66	50.60
Al_2O_3	17.00	13.90	18.61	16.91	16.15
Fe_2O_3	0.97	4.13	1.51	1.71	5.68
FeO	7.60	10.28	7.45	6.17	2.50
MgO	5.41	4.73	6.05	5.50	5.06
CaO	9.82	8.14	8.30	8.26	8.72
Na_2O	3.35	2.82	3.80	2.89	3.86
K_2O	1.31	0.85	0.80	4.45	4.54
H_2O+	1.14	1.57	2.89	1.06	1.36
H_2O-	0.06	0.23	0.16	0.14	0.14
TiO_2	0.80	1.50	0.34	1.32	0.35
P_2O_5	0.19	0.07	0.07	0.91	0.58
MnO	0.14	0.34	0.11	0.16	0.14
CO_2	0.28				0.10
S	0.43		0.02		0.02
Cl					trace
SrO				0.08	
BaO				0.23	
Total	99.39	99.32	100.70 (100.80)	100.45	99.80
Less O≡ S					0.01
					99.79
Sp.gr.			2.894	2.843	

NORMS

	157	158	159	160	161
QTZ	–	4.21	–	–	–
CO	–	–	–	–	–
OR	7.85	5.28	4.78	26.40	27.06
AB	30.46	26.59	34.46	18.76	18.04
AN	27.82	23.90	31.66	20.03	13.38
LC	–	–	–	–	–
NE	–	–	–	4.34	10.10
KP	–	–	–	–	–
AP	.40	.15	.14	1.90	1.22
RU	–	–	–	–	–
IL	1.12	2.19	.47	1.84	.49
PY	1.13	–	.05	–	.05
HE	–	–	–	–	.39
MT	1.02	4.52	1.59	1.78	5.38
EN	3.42	13.82	4.03	–	–
FS	2.14	12.04	2.42	–	–
OL	8.32	–	12.72	11.58	2.70
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	16.27	–	7.62	13.34	21.14
WO	–	7.24	–	–	–

155. **QUARTZ-BEARING DIABASE.** Forty feet wide dyke in Killarnean granite, Shakespeare tp., con. 11, lot 7, Sudbury district, Ont.

41–I–W½ (Anal. R.J.C. Fabry) Ser. No. *1931–7*

Medium-grained, holocrystalline, hypidiomorphic, granular rock, much darker in colour than olivine diabase and devoid of diabasic texture. Hornblende crystals are euhedral with inclusions of clusters of grains of double refracting mineral almost certainly titanite. Very sodic plagioclase is always anhedral to hornblende, and is full of inclusions of epidote, small prismatic particles of hornblende, flakes of mica, and minute prisms of apatite. Quartz forms a mosaic of small grains situated mostly between the plagioclase crystals but it is also interstitial to the hornblende. Scattered through the rock are small specks of pyrite.

(T.C. Phemister)

156. **GABBRO.** Upper part of the composite stock north of the Kingston mineral claim, Hedley mining district, B.C.

92–H–E½ (Anal. M.F. Connor) Ser. No. *1910–11*

Nearly white rock of granitoid texture consisting essentially of plagioclase and pyroxene. Plagioclase forming 56% of the rock is hypidiomorphic with well-developed crystals showing slight zonary banding. Colourless or pale green pyroxene in large tabular crystals of typical augitic habit showing no decomposition forms about 39% of the rock. Orthoclase is sparingly present, titanite is very abundant, and apatite and calcite are also present. (M)

C. Camsell (1910, p. 83)

157. **AUGITE PORPHYRITE.** Fourth level of the War Eagle mine, east face of Red Mountain, Rossland Mining Camp, 6 miles west of the Columbia River and 5 miles north of the International Boundary, Kootenay district, B.C.

82–F–W½ (Anal. Mines Branch) Ser. No. *1915–37*

Very dark greyish black or greenish black rock composed of phenocrysts of augite, hornblende, and plagioclase lying in a fine groundmass chiefly of plagioclase and hornblende. The hornblende is both primary and secondary, has a green colour, low pleochroism, a confused or matted structure, and an imperfect cleavage. The plagioclase is labradorite showing albite and Carlsbad twinning.

C.W. Drysdale (1915b, p. 205)

158. **DIABASE.** Dyke; Rankin tp., Timiskaming district, Ont.

41–P–E½ (Anal. M.F. Connor) Ser. No. *1913–26*

Fine-grained diabase without micrographic intergrowth.

W.H. Collins (1913, p. 76)

159. **AUGITE DIORITE.** Chief country rock of quartz gold veins; near the King Vein, Lorne mine, Bridge River between Rexmount and Gun Lake, Lillooet district, B.C.

92–J–E½ (Anal. M.F. Connor) Ser. No. *1922–1*

Dark greyish green or black, finely granular to coarsely granular rock consisting of green, pleochroic hornblende, colourless augite in short prisms, plagioclase ($Ab_{55}An_{45}$), and orthoclase and quartz in intergrowths or occurring interstitially in small amounts. Plagioclase is allotriomorphic with respect to the hornblende and augite or occurs in lath-shaped crystals within it. Apatite, titanite, and iron oxide are accessory. Alteration products are chlorite, secondary hornblende, kaolin, zoisite, sericite, and calcite.

W.S. McCann (1922, p. 63) *See also* No. 416 *(1922–2)*

160. **MONZONITE.** Stock of hornfelsy, massive rock surrounded by a contact aureole intrusive in Pend d'Oreille schist; halfway between Selkirk Mountain system, B.C.

82–F–W½ (Anal. M.F. Connor) Ser. No. *1912–45*

Dark greenish grey, rather coarse-grained, massive and quite uncrushed rock of hypidiomorphic-granular structure. Essential constituents are feldspar, biotite, and augite. Augite has the character of diopside. The feldspar belongs to the alkaline and soda-lime groups, which are represented in nearly equal proportions. Large, schillerizing crystals are microperthite and soda-orthoclase, which are transitional into one another. They often enclose poikilitically small crystals of plagioclase with irregular zoning. Moderate amounts of apatite and magnetite and rare interstitial grains of quartz are also found.

R.A. Daly (1912, p. 305)

161. **SYENODIORITE MONZONITE (?).** Intermediate zone of the Copper Mountain stock; 1,200 feet from the contact of the intermediate zone and the pegmatite core, and 1,000 feet east of the crusher, Similkameen River, Similkameen district, B.C.

92–H–E½ (Anal. ?) Ser. No. *1934–26*

The stock varies from a syenogabbro at the outer margin to a central core of nearly pure feldspar. The intermediate zone varies from a medium-coarse to coarse-grained rock with crystals averaging between ¼ to ⅛ inch in length. The composition ranges from a syenodiorite having 25% orthoclase, 15% oligoclase, and 15% augite, to a rock approaching a monzonite and consisting of 35% orthoclase, 55% albite-oligoclase ($Ab_{85}An_{15}$), and 7% augite, the remainder consisting of biotite, hornblende, and magnetite. Outstanding peculiarities of all phases are the

	162	163	164	165	166
SiO_2	50.56	50.51	50.49	50.36	50.35
Al_2O_3	18.28	14.74	15.83	13.63	17.35
Fe_2O_3	3.57	1.39	6.11	2.22	12.50
FeO	4.62	12.02	3.04	8.38	
MgO	3.38	4.83	3.38	8.67	4.93
CaO	7.10	10.57	7.99	11.50	10.19
Na_2O	4.30	2.56	3.12	2.54	2.28
K_2O	3.31	0.30	6.86	0.75	0.69
H_2O+	1.40	0.96	1.20	0.05	
H_2O-		0.12	0.29	0.71	
TiO_2	2.25	1.63	0.92	0.90	
P_2O_5		trace	0.42	0.07	
MnO	0.13		0.11	0.20	
CO_2	0.76	nil	0.07		
S		0.08			
SO_3		nil			
volatile					0.75
Total	99.66	99.71	99.83	99.98	99.04
Less O≡ S	0.03				
	99.63				
Sp.gr.		2.96–3.09	2.849	2.970	

NORMS

	162	163	164	165	166
QTZ	–	1.65	–	–	8.28
CO	–	–	–	–	–
OR	20.00	1.83	41.38	4.46	4.24
AB	30.55	23.77	7.62	22.94	21.26
AN	21.20	28.80	9.04	23.70	36.43
LC	–	–	–	–	–
NE	5.30	–	12.54	–	–
KP	–	–	–	–	–
AP	–	–	.89	.14	–
RU	–	–	–	–	–
IL	3.19	2.34	1.30	1.25	–
PY	–	.21	–	–	–
HE	–	–	.67	–	9.03
MT	3.80	1.50	5.49	2.33	–
EN	–	13.90	–	6.61	14.25
FS	–	15.73	–	2.87	–
OL	4.08	–	–	8.99	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	11.84	–	19.16	26.66	–
WO	–	10.21	1.86	–	6.47

absence of both quartz and feldspathoids, the great number of large apatite crystals, and the association of abnormal amounts of orthoclase with the gabbro and diorite phases.

V. Dolmage (1934, p. 13) *See also* Nos. 90, 102, 134, 196 *(1934–28 29, 27, 25)*

162. UMPTEKITE. St. Bruno Mountain, Chambly co., Que.

31–H–W½ (Anal. M.F. Connor) Ser. No. *1910–50*

Light grey or fawn coloured rock consisting of orthoclase, plagioclase, microperthite, biotite, and a colourless augite.

J.A. Dresser (1910, p. 18)

163. DIABASE (GABBRO). Dyke cutting Helen orebody, Helen mine, Michipicoten area, Algoma district, Ont.

42–C–E½ (Anal. W.F. James) Ser. No. *1926–12*

Nearly black, medium-grained, fresh rock consisting of elongated crystals of plagioclase embedded in irregular individuals of reddish augite, irregular grains and aggregates of black iron ore, a few small areas of brown biotite, small rods of apatite, and quartz partly free and partly in micrographic intergrowth with feldspar. (M)

W.H. Collins, T.T. Quirke, E. Thompson (1926, p. 133)
See also Nos. 415, 420 *(1926–11)*

164. AUGITE BIOTITE MALIGNITE (SYENITE). Kruger alkaline body; ledge about 50 yards west of the contact with the older Kruger Mountain schists and 1,200 yards west of the small lake on the top of the mountain plateau, Similkameen district, B.C.

82–E–W½ (Anal. M. Dittrich) Ser. No. *1912–70*

Dark coloured, medium- to fairly coarse-grained, fresh rock of gabbroid habit. The essential minerals are augite with rare outer shells of olive-green hornblende, biotite, microperthite, microcline, nephelite, and probably soda orthoclase. Accessory minerals are apatite, a little titaniferous magnetite or ilmenite, titanite, and abundant melanite. A little hydronephelite and more abundant muscovite are present as secondary products. (M)

R.A. Daly (1912, p. 450) *See also* No. 143 *(1912–71)*

165. HYPERSTHENE GABBRO. Purcell sills, East Kootenay district, B.C.

82–F–E½ (Anal. M.F. Connor) Ser. No. *1914–30*

Dark grey, crystalline, fresh rock of granitic texture, which occurs alone in the simple sills, and grades through intermediate types of acid micropegmatite in the composite ones. Structure is ophitic with augite and hypersthene in equal amounts filling the interstices between the lath-shaped labradorite crystals. Accessory magnetite in irregular grains, apatite in long, colourless, idiomorphic crystals and secondary hornblende are also found.

S.J. Schofield (1914, p. 7)

166. **DOLERITE.** Dykes, Grenville, Argenteuil co., Que.

31–G–E½ (Anal. T.S. Hunt) Ser. No. *1858–5*

Fine-grained, dark, greenish grey dolerite or greenstone consisting of greenish white feldspar mixed with pyroxene, occasional scales of mica, and grains of pyrite.

T.S. Hunt (1859, p. 191) *See also* No. 167 *(1858–5,* 2 specimens*)*

167. **DOLERITE.** Dykes, Grenville, Argenteuil co., Que.

31–G–E½ (Anal. T.S. Hunt) Ser. No. *1858–5*

Fine-grained, dark greenish grey dolerite or greenstone consisting of greenish white feldspar mixed with pyroxene, occasional scales of mica and grains of pyrite.

T.S. Hunt (1859, p. 191) *See also* No. 166 *(1858–5,* 2 specimens*)*

168. **ESSEXITE (GABBRO).** Northwest face of St. Hilaire Mountain where a perpendicular cliff overlooks the village of St. Hilaire, Rouville co., Que.

31–H–W½ (Anal. ?) Ser. No. *1914*–7

Holocrystalline, medium-grained rock, spotted black and white. Consists of short, round prisms of apatite, a few irregular grains of pyrite, iron ore, a few irregular grains of titanite, zircon, a few irregular grains of olivine showing serpentinization, some very light grey, faintly pleochroic augite, fairly abundant biotite, hornblende, labradorite, and nephelite. Secondary minerals are chlorite, serpentine, and muscovite. (M)

J.J. O'Neill (1914, p. 30)

169. **HORNBLENDE GABBRO.** Thick sills injected into the Keewatin series; south side of Grassy Portage Bay, Rainy Lake, Rainy River district, Ont.

52–C–W½ (Anal. M.F. Connor) Ser. No. *1913–47*

Dark, coarsely granular rock consisting of hornblende, feldspar, magnetite, and rare quartz associated with feldspar. Hornblende is green, and occurs in large anhedrons, which appear to have more approximation to idiomorphism than the feldspar. They are poikilitic owing to inclusion of numerous small anhedrons of untwinned feldspar. Feldspar is fresh labradorite in large anhedrons allotriomorphic to hornblende showing broad twin lamellae, and altered occasionally to epidote and zoisite. Magnetite occurs in abundant large irregular grains.

A.C. Lawson (1913, p. 50)

	167	168	169	170	171
SiO_2	50.25	49.96	49.58	49.51	49.44
Al_2O_3	32.10	18.83	16.37	12.39	13.85
Fe_2O_3		2.52	1.73	1.72	3.43
FeO		6.64	11.55	6.83	5.24
MgO	5.04	3.52	5.37	10.42	8.48
CaO	9.63	7.42	10.26	11.45	7.80
Na_2O	2.12	5.25	2.14	2.64	3.34
K_2O	0.58	2.58	1.05	0.04	3.95
H_2O+		0.60	0.44	3.23	3.30
H_2O-			0.14	0.43	
TiO_2		2.40	1.00	0.90	0.62
P_2O_5		0.25	0.03	0.07	
MnO			0.17	0.15	0.15
CO_2				0.06	1.00
S			0.05		
Cl			0.25		
SrO			trace		
BaO			trace		
NiO				0.03	
Cr_2O_3			nil	0.06	
volatile	1.00				
Total	100.72	99.97	100.13	99.93	100.60
Less O≡ S, Cl			0.08		
			100.05		
Sp.gr.		2.92			

NORMS

	167	168	169	170	171
QTZ		–	–	–	–
CO		–	–	–	–
OR		15.21	6.36	.24	23.81
AB		28.44	19.66	24.31	15.07
AN		20.09	32.70	22.40	11.30
LC		–	–	–	–
NE		11.09	–	–	9.27
KP		–	–	–	–
AP		.52	.06	.15	–
RU		–	–	–	–
IL		3.32	1.42	1.28	.87
PY		–	.13	–	–
HE		–	–	–	–
MT		2.61	1.84	1.90	3.64
EN		–	9.47	9.91	–
FS		–	9.79	2.85	–
OL		6.68	3.08	8.50	13.46
AC		–	–	–	–
NSI		–	–	–	–
KSI		–	–	–	–
DI		12.00	15.43	28.40	22.53
WO		–	–	–	–

170. ALBITE PYROXENE DIABASE (SYENODIORITE). Sill showing a definite chill contact with cherty sediments; ½ mile south of lat. 59°30'00", long. 129°45'00" on the east bank of Little Blue River, Cassiar district, B.C.

104–N–W½ (Anal. J.A. Maxwell) Ser. No. *1955–3*

Medium-grained, greenish, fairly fresh rock containing 60–65% albitic plagioclase feldspar and approximately 30% augite. Pyroxene has altered in part to actinolitic amphibole and chlorite. Plagioclase contains numerous small inclusions. Considerable ilmenite, sphene, and leucoxene are present. A well-defined sub-ophitic texture has been preserved.

(H.G. Gabrielse)

171. MINETTE. Dyke from 10–150 feet wide, tunnel No. 1, McKinley mine, McKinley Mountain, Franklin mining district, 37 miles due north of Grand Forks, Similkameen district, B.C.

82–E–E½ (Anal. Mines Branch) Ser. No. *1915–13*

Holocrystalline, fine-grained, compact, dark greenish grey rock of trachytoid structure, with some phenocrysts of pyroxene. Minerals present are apatite, biotite, irregular masses of pale greenish diopsidic augite, with iron ore frequently clustered about it, orthoclase, plagioclase, and traces of olivine. Chlorite, calcite, and kaolin are alteration products. The biotite is brownish yellow in the interior, and becomes deep brown at the borders. The orthoclase is clouded by incipient kaolinization and occurs in greater amounts than the fresher plagioclase.

C.W. Drysdale (1915a, p. 121)

172. AUGITE SYENITE. Elongated stock intrusive in pyroxenite and rocks of the Tulameen Group, southern end of Olivine Ridge between Slate and Champion Creeks, Tulameen district, B.C.

92–H–E½ (Anal. M.F. Connor) Ser. No. *1913–20*

Fine- to medium-grained, massive rock of granitic texture, showing mainly a white or slightly yellowish feldspar, and a black augite or hornblende. Augite is the principal dark mineral and is often altered to hornblende. Less often the hornblende is original, altering to chlorite. A few shreds of brown biotite, and some quartz, either interstitial between feldspars or intergrown with the orthoclase, are present. The feldspars are so cloudy and full of inclusions that it is difficult to separate the orthoclase from the plagioclase. Magnetite, titanite, and some apatite are accessory. Secondary minerals are chlorite, epidote, mica, and some calcite. The rock is much altered.

C. Camsell (1913, p. 71)

	172	173	174	175	176
SiO_2	49.41	49.40	49.32	48.78	48.68
Al_2O_3	18.08	12.22	13.33	16.07	15.55
Fe_2O_3	5.93	1.87	1.28	1.74	1.94
FeO	4.08	7.44	7.76	9.87	8.37
MgO	4.61	11.80	11.13	4.53	8.50
CaO	10.10	11.60	11.73	11.29	11.34
Na_2O	3.48	2.16	2.12	2.58	1.84
K_2O	1.01	0.93	1.12	0.28	0.46
H_2O+	1.59	0.98	0.64	2.04	1.47
H_2O-	0.04	0.14		0.13	0.05
TiO_2	0.95	0.90	0.42	1.31	0.89
P_2O_5		0.17	0.06	0.31	0.09
MnO	0.09	0.17		0.05	0.15
CO_2		0.25	0.89	0.71	0.27
S		0.10		0.30	0.07
Cl		0.13		trace	0.02
SrO		0.04			
BaO		0.03			
NiO				trace	
Cr_2O_3		0.08		0.02	0.06
Total	99.37	100.41	99.82 (99.80)	99.99 (100.01)	99.75
Less O≡ S, Cl		0.07		0.11	0.03
		100.34		99.88 (99.90)	99.72
Sp.gr.					3.005

NORMS

	172	173	174	175	176
QTZ	.41	–	–	1.11	–
CO	–	–	–	–	–
OR	6.13	5.48	6.64	1.72	2.78
AB	32.04	19.32	19.06	24.16	16.87
AN	31.51	20.82	23.58	32.79	33.52
LC	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	–	.354	.12	.67	.19
RU	–	–	–	–	–
IL	1.35	1.24	.58	1.90	1.26
PY	–	.26	–	.81	.18
HE	–	–	–	–	–
MT	6.34	2.02	1.33	1.91	2.13
EN	13.16	3.99	.76	13.15	14.41
FS	1.02	1.09	.25	12.27	6.35
OL	–	16.68	20.08	–	3.49
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	28.69	27.54	–	18.76
WO	7.99	–	–	9.44	–

173. SYENITE. Basic phase of intrusive in Couchiching and Keewatin series; west side of island in Rocky Islet Bay, Rainy Lake, Rainy River district, Ont.

52–C–W½ (Anal. M.F. Connor) Ser. No. *1913–44*

Composed chiefly of green hornblende with some biotite and subordinate amounts of feldspar in which an acid plagioclase predominates over orthoclase. There is abundant epidote and considerable titanite and a very little quartz. The structure is hypidiomorphic granular.

A.C. Lawson (1913, p. 91)

174. ENSTATITE GABBRO. Murray's pit, Emerald mine, Buckingham tp., Papineau co., Que.

31–G–W½ (Anal. M. Dittrich) Ser. No. *1899–4*

Rather coarse, dark grey rock with reddish brown mica collected into lines that mark joint planes. Consists essentially of very fresh, twinned triclinic feldspar, and an equal quantity of pyroxene, both monoclinic and rhombic. Small leaves of mica have formed in the cleavage cracks of the rhombic pyroxene, and its formation is connected with the formation of apatite and phlogopite of the veins. Rounded grains of apatite are fairly abundant.

A. Osann (1902, p. 41)

175. PYROXENITE. Fire Rangers Hill, west of Gwillim Lake, Opemisca map-area, Abitibi Territory, Que.

32–G–W½ (Anal. R.J.C. Fabry) Ser. No. *1938–8*

Green, fresh rock that grades with no definite contact into bladed coarse gabbro.

(G.W.H. Norman)

176. DIABASE. Yellowknife greenstone belt, Yellowknife, Mackenzie district.

85–J–E½ (Anal. J.A. Maxwell) Ser. No. *1955–15*

Youngest rocks in the area containing essentially plagioclase, augite, olivine, some quartz, and minor amounts of serpentine. Accessory minerals are ilmenite and/or titaniferous magnetite, apatite, pyrite, and pyrrhotite. Relatively unaltered except where cut by late faults and fractures.

R.W. Boyle (1961, p. 77)

177. SHONKINITE. Small prospect hole on the river side of the slope between Union mine and the Lièvre River, Portland tp., Papineau co., Que.

31–G–W½ (Anal. M. Dittrich) Ser. No. *1899–28*

Uniform, medium- to coarse-grained, unaltered rock very rich in dark coloured constituents, and without any parallel structure. None of the

	177	178	179	180	181
SiO_2	48.60	48.57	48.33	48.07	47.76
Al_2O_3	13.60	16.65	12.56	21.61	18.58
Fe_2O_3	2.30	2.29	1.87	0.87	2.19
FeO	4.97	6.77	5.26	5.16	9.39
MgO	8.79	3.59	9.07	8.56	4.15
CaO	10.00	14.54	8.94	11.85	9.39
Na_2O	1.42	2.07	1.81	1.40	3.61
K_2O	5.62	0.28	4.67	0.36	0.47
H_2O+	0.61	1.66	2.63	1.09	0.53
H_2O-		0.03	0.97	0.09	0.12
TiO_2	0.79	0.50	0.81	0.16	2.20
P_2O_5	0.19	1.68	0.78		0.78
MnO		0.03	0.13	trace	0.29
CO_2	1.23	0.84	2.64		
S		0.13		0.37	
SO_3	0.54				
Cl		0.01			
SrO			0.05		0.03
BaO		0.03	0.24		0.02
NiO		trace			
Cr_2O_3		0.06		0.06	
Total	98.66	99.73	100.76	99.65	99.51
Less O≡ S, Cl		0.05		0.14	
		99.68		99.51	
Sp.gr.			2.771		2.957

NORMS

	177	178	179	180	181
QTZ	–	4.78	–	3.12	–
CO	–	–	–	10.31	–
OR	30.36	1.73	28.87	2.11	2.84
AB	–	19.45	9.77	12.47	33.09
AN	14.46	36.97	12.86	25.46	33.79
LC	3.03	–	–	–	–
NE	7.84	–	4.31	–	–
KP	–	–	–	–	–
AP	.40	3.68	1.70	–	1.66
RU	–	–	–	–	–
IL	1.12	.72	1.17	.22	3.12
PY	–	.35	–	.95	–
HE	–	–	–	–	–
MT	2.46	2.50	2.03	.90	2.33
EN	–	10.46	–	32.74	3.98
FS	–	8.37	–	11.67	3.58
OL	12.08	–	15.48	–	8.45
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	28.20	–	23.76	–	7.11
WO	–	10.93	–	–	–

principal constituents exhibit idiomorphic outline. The feldspar is an unaltered, almost completely untwinned microperthite, with small quantities of lime-soda feldspar filled with alteration products. Light-green augite is transparent with the first stage of uralitization. Mica is frequently intergrown regularly with hornblende. Titanite and metallic minerals are accessory.

A. Osann (1902, p. 45)

178. GABBRO. Central part of gabbro hill, west of the west end of Gwillim Lake, Opemisca map-area, Abitibi territory, Que.

32–G–W½ (Anal. R.J.C. Fabry) Ser. No. *1938–4*

White gabbro, rather high in feldspar, low in femic minerals. The femic minerals present are equidimensional. To the east the gabbro passes into amphibolite, and to the west becomes higher in feldspar and lower in femic minerals, and carries 10% quartz.

(G.W.H. Norman)

179. OLIVINE-AUGITE MINETTE. Two-foot sill cutting the Wolf grit and itself cut by a granite dyke contemporaneous with the Bayonne batholith; on main summit of the Selkirks, 1 mile north of the Dewdney trail, Similkameen district, B.C.

82–F–W½ (Anal. M.F. Connor) Ser. No. *1912–48*

Consists of phenocrysts of pale green augite, a few biotite foils, and abundant round masses of serpentine almost certainly derived from olivine, in a groundmass of a multitude of idiomorphic deep brown biotites and a few microlites of orthoclase embedded in a colourless glass. It is relatively fresh, but chlorite, calcite, and serpentine are secondary.

R.A. Daly (1912, p. 311)

180. DIORITE. Associated with, and presumed genetically related to, andesitic greenstones; from a depth of 601 feet, D.D. Hole No. 3, Ural mineral claim, B.R.X. property, Bridge River mining camp, Lillooet district, B.C.

92–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1935–24*

Moderately coarse-grained, fairly fresh, massive rock containing large crystals of hornblende containing many euhedral crystals of bytownite. Relics of augite are visible in some of the hornblende. Minor and secondary constituents include pyrite, titanite, chlorite, talc, serpentine (?), and a very little carbonate. No quartz was observed.

C.E. Cairnes (1937, p. 23) *See also* Nos. 215, 438, 442, 488 *(1935–23, 22, 21, 25)*

	182	183	184	185	186
SiO_2	47.75	47.64	47.58	47.42	46.30
Al_2O_3	9.43	13.63	18.03	15.65	2.58
Fe_2O_3	3.44	1.80	1.10	2.66	3.45
FeO	13.76	13.77	3.34	4.05	3.57
MgO	7.45	4.77	10.88	4.90	23.18
CaO	11.75	8.10	16.92	8.56	15.20
Na_2O	2.02	3.69	1.04	2.60	0.15
K_2O	0.28	1.21	0.32	4.10	
H_2O+	1.76	0.34	0.60	2.60	4.77
H_2O-	0.19	0.03		0.30	0.66
TiO_2	1.81	3.66	0.20	0.70	trace
P_2O_5	0.12	0.72	0.01	0.54	
MnO	trace	0.27	0.06	0.10	
CO_2	0.54			6.24	
S	0.09	0.34			
Cl		trace			
SrO				0.10	
BaO		0.04		0.14	
Total	100.36 (100.39)	100.01	100.08	100.66	99.86
Less O≡ S, Cl	0.03	0.13			
	100.33 (100.36)	99.88			
Sp.gr.				2.740	

NORMS

	182	183	184	185	186
QTZ	–	–	–	–	
CO	–	–	–	–	
OR	1.742	7.33	1.86	26.34	
AB	19.06	33.91	7.25	17.59	
AN	16.64	17.44	42.90	20.50	
LC	–	–	–	–	
NE	–	–	1.16	4.64	
KP	–	–	–	–	
AP	.26	1.54	.02	1.22	
RU	–	–	–	–	
IL	2.64	5.21	.27	1.05	
PY	.24	.90	–	–	
HE	–	–	–	–	
MT	3.77	1.92	1.13	3.01	
EN	10.19	1.12	–	–	
FS	7.96	1.25	–	–	
OL	2.32	14.01	13.52	7.07	
AC	–	–	–	–	
NSI	–	–	–	–	
KSI	–	–	–	–	
DI	35.12	15.31	31.85	18.54	
WO	–	–	–	–	

181. GABBRO. Ashnola batholith, between the eastern and western phases of the Remmel batholith, near the contact with the Remmel granite; about 300 yards north of the International Boundary, Yale district, B.C.

92–H–E½ (Anal. M.F. Connor) Ser. No. *1912–75*

Fresh, with feldspars of glassy clearness, and deep fawn colour. Essential constituents are green augite, often colourless in section, brownish-green hornblende, brown biotite, and labradorite. Abundant apatite, some magnetite, probably titaniferous, and a very little interstitial quartz are the accessories. The structure is hypidiomorphic-granular, though the augite is often poikilitic. Regular intergrowths of augite and hornblende are common.

R.A. Daly (1912, p. 435)

182. DIABASIC GABBRO. Five-Mile Lake Mountain, Opemisca map-area, Abitibi territory, Que.

32–G–W½ (Anal. R.J.C. Fabry) Ser. No. *1938–10*
(G.W.H. Norman)

183. OLIVINE DIABASE (GABBRO). Espanola Mills dyke, Espanola, Merritt tp., Sudbury district, Ont.

41–I–W½ (Anal. R.J.C. Fabry) Ser. No. *1931–9*

Normal diabase with typical diabase texture plainly seen on weathered surfaces. Consists of plagioclase, brown to violet augite, olivine, and a little biotite. Many crystals of olivine are entirely within the augite. Contact of olivine crystals with other minerals except biotite is sharp. Biotite is a reddish-brown variety invariably associated with magnetite, which appears to replace it. Abundant prisms of apatite occur frequently concentrated near biotite-iron ore aggregates. (M)

(T.C. Phemister)

184. OLIVINE GABBRO. East Sooke Peninsula, Vancouver Island, B.C.

92–B–W½ (Anal. M.F. Connor) Ser. No. *1919–23*

Fresh, fine-grained rock containing approximately 5% olivine, the remainder being pyroxene and feldspar in about equal proportions.

H.C. Cooke (1919, p. 18)

185. KERSANTITE. Four foot dyke cutting Pend d'Oreille limestone; on the summit of the ridge dividing the waters of Lost Creek and Sheep Creek, Selkirk Mountain system, Kootenay district, B.C.

82–F–W½ (Anal. M.F. Connor) Ser. No. *1912–42*

Dark, greenish-grey, fine-grained, non-porphyritic trap, evidently highly micaceous. Essentially a panidiomorphic aggregate of brown biotite and

	187	188	189	190	191
SiO_2	46.25	45.92	45.90	45.44	45.37
Al_2O_3	15.58	16.34	6.59	5.85	6.21
Fe_2O_3	3.33	1.92	7.58	2.84	2.40
FeO	7.97	2.34	8.19	6.49	8.09
MgO	7.66	12.46	7.70	16.24	18.67
CaO	11.51	19.00	18.00	18.16	14.47
Na_2O	2.42	0.85	2.16	1.03	0.85
K_2O	0.75	0.30	1.46	0.38	0.37
H_2O+	1.75	1.03	1.20	1.15	0.88
H_2O-	0.07			0.10	
TiO_2	0.79	0.14	1.10	1.50	1.50
P_2O_5	1.85	0.03			
MnO	0.06	0.01	0.20	0.24	
CO_2	0.15	0.41			0.62
S	0.10				
Cl	0.03				
BaO	0.03				
Cr_2O_3	nil				
NiO	nil				
Total	100.30	100.75	100.08	99.42	99.43
Less O≡ S, Cl	0.04				
	100.26				
Sp. gr.				3.35	

NORMS

	187	189	191
QTZ	–	–	–
CO	–	–	–
OR	4.53	8.95	2.18
AB	22.17	2.67	3.22
AN	30.03	4.10	12.01
LC	–	–	–
NE	–	10.45	2.63
KP	–	–	–
AP	3.95	–	–
RU	–	–	–
IL	1.12	1.58	2.08
PY	.26	–	–
HE	–	–	–
MT	3.54	8.19	2.50
EN	9.10	–	–
FS	3.77	–	–
OL	8.57	–	27.52
AC	–	–	–
NSI	–	–	–
KSI	–	–	–
DI	12.91	57.19	47.82
WO	–	6.83	–

an imperfectly twinned plagioclase. A little orthoclase is present, and magnetite and apatite are accessory. Quartz kaolin, chlorite, and especially calcite are abundant secondary products. Neither augite, hornblende, nor olivine is present. Small spherical aggregates of plagioclase crystals often mixed with quartz or calcite or with both, and wrapped about with mica foils, characterize the dyke from wall to wall.

R.A. Daly (1912, p. 313)

186. PYROXENITE. Garthby tp., rge. 2, lot 40, Wolfe co., Que.

21–E–W½ (Anal. M.F. Connor) Ser. No. *1913–8*

A dark green holocrystalline rock, often very coarse in texture. Pyroxene is the most abundant mineral, with small amount of interstitial serpentine and grains of iron oxide. Remnants of olivine are occasionally found.

J.A. Dresser (1913, p. 31)

187. DIORITE. Diorite-granodiorite complex of the mineralized zone, cut by numerous greenstone dykes; DD Hole No. 8, 125–127 feet north end of Deschene Island west of the south section of the quartz vein, McKay Quebec Exploration Co., Opemisca map-area (E½), Abitibi territory, Que.

32–G–W½ (Anal. R.J.C. Fabry) Ser. No. *1938–7*

Typical medium-grained diorite containing no visible quartz, and about 50% altered hornblende.

(G.W.H. Norman)

188. INTRUSIVE. Large laccolithic mass; outcropping above the highway northeast of Zwicky, Slocan map-area, Kootenay district, B.C.

82–F–W½ (Anal. W.A. Jones) Ser. No. *1934–32*

Medium-grained, massive rock of granitic texture composed of pale green amphibole resembling hornblende occurring in part as distinct, well developed, twinned crystals and in part as a uralitic alteration product of original augite; plagioclase about andesine in composition; chlorite, epidote, and other alteration products.

C.E. Cairnes (1934, p. 46)

189. SHONKINITE PYROXENITE (SYENITE). Prospect shaft on the Averill property, Franklin mining camp, Similkameen district, B.C.

82–E–E½ (Anal. Mines Branch) Ser. No. *1915–12*

Coarse-grained, black to dark green rock composed dominantly of pyroxene. In the coarsest-grained forms the augite crystals are so large and abundant as to give the rock a strongly porphyritic appearance. Small prisms of euhedral and anhedral apatite are enclosed in magnetite, augite, and feldspar. Titanite occurs in wedge-like crystals. Magnetite and pyrite occur chiefly in irregular forms. Hornblende forms green irregular masses

	192	193	194	195	196
SiO_2	44.62	44.39	44.00	43.91	43.12
Al_2O_3	7.90	8.36	27.73	19.63	18.19
Fe_2O_3	4.22	2.18	2.36	4.16	6.20
FeO	5.67	8.25	3.90	5.55	6.43
MgO	14.00	16.70	2.30	5.20	6.52
CaO	19.44	12.90	13.94	9.49	14.00
Na_2O	1.20	1.28	2.36	4.49	2.49
K_2O	0.31	1.28	0.45	1.51	0.81
H_2O+	0.75	2.08	0.80	0.53	0.65
H_2O-	0.07	0.02			0.10
TiO_2	1.87	1.98	1.90	3.80	0.50
P_2O_5			0.20	0.32	1.00
MnO	0.10	0.15	0.08	0.07	0.12
CO_2	0.61			0.51	0.17
S					0.05
FeS_2				0.64	
Total	100.75	99.57	100.02	99.81	100.35
Less O≡ S	(100.76)				0.02
					100.33

NORMS

	193	194	195	196
QTZ	–	–	–	–
CO	–	–	–	–
OR	7.48	2.68	9.15	4.85
AB	–	15.51	14.21	10.98
AN	13.33	64.30	29.63	36.46
LC	.10	–	–	–
NE	6.92	3.51	16.23	6.97
KP	–	–	–	–
AP	–	.42	.15	2.11
RU	–	–	–	–
IL	2.76	2.66	.45	.70
PY	–	–	1.70	.13
HE	–	–	–	–
MT	2.28	2.48	4.44	6.54
EN	–	–	–	–
FS	–	–	–	–
OL	26.25	4.97	9.44	9.39
AC	–	–	–	–
NSI	–	–	–	–
KSI	–	–	–	–
DI	40.84	3.41	14.55	21.82
WO	–	–	–	–

within augite. Biotite occurs in small well-formed tablets. Chalcopyrite, orthoclase, microcline, quartz in small grains in the feldspar, chlorite, and calcite are also present. (M)

C.W. Drysdale (1915a, p. 112)

190. OLIVINE-YAMASKITE (PERIDOTITE). Eastern half of Rougemont Mountain, Rouville and St. Hyacinthe counties, Que.

31–H–W½ (Anal. M.F. Connor) Ser. No. *1914–12*

Dark, green-black coarsely crystalline rock consisting of olivine, basaltic hornblende and augite, biotite, anorthite, black iron ore, and serpentine. Olivine forms large, colourless crystals, and small individuals, traversed by irregular cracks where serpentine has begun to form. Augite is the abundant constituent, and is a titaniferous variety. It contains poikilitic crystals of olivine. Hornblende forms narrow borders to the augite individuals, and is often intergrown. Anorthite fills the interspaces between the other minerals. (M)

J.J. O'Neill (1914, p. 65)

191. ESSEXITE. Forms greater part of St. Bruno Mountain, Chambly co., Que.

31–H–W½ (Anal. M.F. Connor) Ser. No. *1910–47*

A dark greenish-grey coarsely crystalline rock of granitic structure. Augite appears flesh-coloured, and is not noticeably pleochroic. Biotite is abundant, and is very commonly intergrown with augite. Pleochroic hornblende occurs in the same proportion as biotite. The plagioclase is a rather broadly striated basic labradorite. The rock is frequently rich in olivine.

J.A. Dresser (1910, p. 17)

192. ESSEXITE. Bordering on the yamaskite of Rougemont Mountain, Rouville and St. Hyacinthe counties, Que.

31–H–W½ (Anal. M.F. Connor) Ser. No. *1914–13*

Dark-grey, medium-grained rock with a few larger crystals of pyroxene. Stout, well-formed augite crystals, reddish brown olivine, black iron ore, small white anorthite crystals, brown hornblende, and secondary calcite and serpentine are also present.

J.J. O'Neill (1914, p. 67) *See also* No. 190 *(1914–12)*

193. ESSEXITE PORPHYRY. Dyke 2 feet 6 inches wide cutting essexite, 1,000 feet southwest of the essexite body of Rougemont Mountain, Rouville and St. Hyacinthe counties, Que.

31–H–W½ (Anal. M.F. Connor) Ser. No. *1914–14*

Dark grey rock with greenish tinge imparted by amber-green glassy olivines and darker green pyroxene phenocrysts. Coarser-grained and more abundant in phenocrysts toward the centre, until it becomes holocrystalline. Black iron ore is abundant in small grains evenly distributed in the groundmass. Pyrite occurs in irregular grains. Olivine occurs in small rounded crystals enclosed in augite and as 2 mm long phenocrysts, and is highly decomposed. Augite shows well-developed cleavage, and is free from iron ore. Calcite, brown hornblende, and serpentine, talc, and chalcedony from the decomposition of olivine are also present.

J.J. O'Neill (1914, p. 81) *See also* Nos. 190, 192 *(1914–12, 13)*

194. ESSEXITE. Earliest of the three intrusions of Brome Mountain, Brome and Shefford counties, Que.

31–H–E½ (Anal. M.F. Connor) Ser. No. *1902–28*

Massive, grey, medium-grained rock of granitic structure. Plagioclase makes up as much as 90% of the rock. The remaining constituents are pyroxene, olivine, and biotite, with accessory magnetite and apatite. Hornblende is present in many parts of the rock in amounts equal to pyroxene, but in other parts seems to be absent.

J.J. Dresser (1903, p. 317)

195. ESSEXITE (GABBRO or MONZONITE). Igneous core of Mount Yamaska; along the western half of the southern boundary in a zone between a main area of akerite on the west and the small exposure of akerite on the eastern contact with the intruded sediments, Rouville co., Que.

31–H–E½ (Anal. G.A. Young) Ser. No. *1904–2*

Medium- to coarse-grained, holocrystalline rock in which the dark-coloured constituents form ⅓ to ½ of the whole. Flow structures or porphyritic structures are locally developed. Varying amounts of plagioclase and alkali-feldspars, nephelite, pyroxene, hornblende, biotite, olivine, apatite, iron ore, pyrite, titanite, and small amounts of secondary minerals are present, though not always in the same section. The plagioclase occurs in well-twinned, frequently-zoned laths with composition ranging from acid to basic labradorite centres with outer zones of acid oligoclase and in places orthoclase. (M)

G.A. Young (1906, p. 26)

196. SYENOGABBRO (DIORITE or GABBRO). Extreme edge of the Copper Mountain Stock, at the end of the lower road on the west side of the Similkameen River, Similkameen district, B.C.

92–H–E½ (Anal. ?) Ser. No. *1934–25*

The stock varies from a syenogabbro on the margin to a pegmatite of nearly pure feldspar in the core. The syenogabbro is a fine-grained rock consisting of about 50% plagioclase, much of it zoned and varying from labradorite to andesine, 10–15% orthoclase, 30–40% augite, 2–11% irregularly distributed, and about 4% magnetite. Hornblende is absent.

	197	198	199	200	201
SiO_2	42.99	42.96	42.88	42.31	41.84
Al_2O_3	1.11	17.45	3.54	11.40	28.42
Fe_2O_3	1.87	2.29	10.38	4.07	3.29
FeO	5.91	11.04	4.90	6.11	0.40
MgO	43.14	9.77	25.13	11.31	0.25
CaO	0.10	6.80	6.50	11.02	0.66
Na_2O	0.29	1.93	nil	0.82	19.48
K_2O	0.13	1.51	nil	3.69	2.06
H_2O+	4.00	4.75	5.36	2.72	0.62
H_2O-	0.51	0.47	0.44	2.28	0.14
TiO_2	trace	0.66	0.29	2.00	0.00
P_2O_5	0.04			1.44	0.04
MnO	0.05			0.11	0.15
CO_2	nil		trace	trace	0.00
Cl					4.47
SrO				0.16	
BaO				0.64	
Cr_2O_3				0.05	
NiO	0.15		0.12		
Total	100.29	99.63	99.54	100.13	101.82
					1.10
Less O≡ Cl					(0.98)
					100.72
					(100.84)
Sp.gr.	3.075			2.817	

NORMS

	197	198	199	200	201
QTZ	–	–	–	–	
CO	.41	.28	–	–	
OR	.71	9.40	–	19.59	
AB	2.41	18.22	–	–	
AN	.21	35.53	10.02	17.32	
LC	–	–	–	2.68	
NE	–	–	–	4.63	
KP	–	–	–	–	
AP	.07	–	–	3.16	
RU	–	–	–	–	
IL	–	.96	.41	2.92	
PY	–	–	–	–	
HE	–	–	–	–	
MT	1.80	2.51	11.24	4.51	
EN	19.81	.37	48.06	–	
FS	1.34	.20	.09	–	
OL	73.20	32.49	11.36	17.58	
AC	–	–	–	–	
NSI	–	–	–	–	
KSI	–	–	–	–	
DI	–	–	18.76	27.57	
WO	–	–	–	–	

Outstanding peculiarities of all phases of the stock are absence of both quartz and feldspathoids, a great number of large apatite crystals, and the association of abnormal amount of orthoclase with the gabbro and diorite phases.

V. Dolmage (1934, p. 13) *See also* Nos. 90, 102, 134, 161 *(1934–28, 29, 27, 26)*

197. **HARZBURGITE.** Mass enclosed in older andesitic traps of the Rossland volcanic group; on the Dewdney trail south of the head-waters of Santa Rosa Creek, Rossland Mountains, B.C.

82–F–W½ (Anal. M.F. Connor) Ser. No. *1912–54*

Massive, deep green, porphyritic rock bearing on its surface abundant cleavage faces of idiomorphic enstatite, which is embedded in a compact base of olivine and its derivative, serpentine. Chromite and magnetite, which may be entirely secondary from altered olivine, are the other constituents. The enstatite is generally fresh, but has yielded some secondary talcose material. The rock may be extrusive and if so, would be called picrite.

R.A. Daly (1912, p. 336)

198. **DIABASE.** Garthby tp., rge. 2, lot 40, Wolfe co., Que.

21–E–W½ (Anal. M.F. Connor) Ser. No. *1913–5*

Fine-grained greyish-green rock of which chlorite, epidote, quartz, calcite, and leucoxene, all secondary, are the principal constituents. Actinolite forms tuft-like aggregates of fine crystals in a few places. Pyrite, and in places magnetite, are common accessory minerals. Specks and strings of chalcopyrite are present.

J.A. Dresser (1913, p. 32)

199. **PERIDOTITE.** Martin mineral claim, L 174–124, north of Oiseau River and 3½ miles west of the west end of Oiseau Lake, in the vicinity of Cat Lake, Man.

52–L–W½ (Anal. A. Sadler) Ser. No. *1924–7*

Massive, coarse-grained, brownish weathering rock, with light coloured veinlets of asbestos-like material up to ¼-inch wide. Some show markings somewhat similar to poorly developed pillows and also features suggesting flow structures common in lavas, but in thin section the rock more closely resembles an intrusive body. Noticeable features are the absence of fresh minerals and of feldspar, the great abundance of amphibole-like alteration material, abundance of magnetite, and the uniformity of mineral composition and alteration. No trace of original minerals remains, having been altered to a mat of fibrous minerals, including pyroxene, amphibole, serpentine, talc, and chlorite.

J.F. Wright (1926, p. 72)

200. **MISSOURITE (PERKNITE).** Five foot dyke cutting the Coryell syenite, in the col between Record Mountain and Granite Mountain, west-northwest of Rossland, Kootenay district, B.C.

82–E–E½ (Anal. M.F. Connor) Ser. No. *1912–62*

Dark brownish-green, fine-grained, somewhat porphyritic trap, bearing conspicuous phenocryst-like areas referred to as pseudoleucite. Idiomorphic prisms of pale-green non-pleochroic augite, strongly pleochroic brown biotite, abundant cubes of magnetite, and many relatively large prismatic crystals of apatite are embedded in a pale greenish to brownish matrix, largely composed of the same material as that forming the pseudoleucite phenocrysts. The phenocrysts have roundish outlines wrapped about with foils of fresh, primary biotite. The phenocrystic mass is chiefly made up of spherulitic aggregates of fibrous material, which is interpreted as orthoclase replacing the original mineral. Regularly mixed with a small amount of minerals resembling hydronephelite and serpentine. A zeolite may be present. All of these materials form a matrix in which very small microlites of augite, biotite, magnetite, and apatite are embedded. (M)

R.A. Daly (1912, p. 368)

201. **TAWITE (SYENITE).** Near the northeast contact of the nephelite-sodalite syenite mass on St. Hilaire Mountain, Rouville co., Que.

31–H–W½ (Anal. M.F. Connor) Ser. No. *1914–10*

Light-grey, coarse-grained, inequigranular rock consisting of a mosaic of well-bounded crystals of feldspathoid in a matrix of feldspar, a few small crystals of pyroxene, and a little black iron ore. Aegirite forms very small crystals included in all other minerals, and a few larger crystals, which enclose small feldspars. Feldspar is mostly orthoclase in laths and irregular crystals, with fewer minute laths of plagioclase. The feldspathoid, greatly exceeding the finer groundmass in amount, is very abundant sodalite and subangular crystals of nephelite, which include earlier minerals and some needles of a colourless zeolite. (M)

J.J. O'Neill (1914, p. 48)

202. **IJOLITE (PERKNITE).** Transition rock from the coarser, pegmatitic varieties of the complex, which ranges from a fine-grained, phanerocrystalline rock to coarse-grained, porphyritic and pegmatitic types; Ice River, Kootenay district, B.C.

82–N–E½ (Anal. M.F. Connor) Ser. No. *1914–24*

Porphyritic rock with equal amounts of nephelite and pyroxene. Consists essentially of nephelite, several varieties of pyroxene, and amphibole, with sphene or ilmenite, calcite, apatite, and locally feldspar as accessory minerals. Nephelite occurs in polygonal, frequently equant anhedral

	202	203	204	205	206
SiO_2	41.66	41.58	41.36	40.95	40.72
Al_2O_3	22.75	30.36	1.21	16.45	2.78
Fe_2O_3	2.33	2.46	9.18	13.47	6.58
FeO	6.08	1.64			4.24
MgO	3.11	0.37	42.90	6.10	26.25
CaO	7.76	0.88	1.34	10.53	8.66
Na_2O	8.81	14.30	0.04	4.00	0.42
K_2O	3.12	5.15	0.04	1.28	0.27
H_2O+	1.50	) 1.01	1.94		5.51
H_2O-	0.03		0.16		0.26
TiO_2	1.95	0.22	nil	3.39	0.07
P_2O_5	0.10	0.07	0.04		0.28
MnO	0.14	0.03	0.10	0.33[1]	0.14
CO_2	0.40	0.80	1.40		3.20
S	0.08		0.50		0.70
SO_3	0.05				
Cl	0.02				0.06
SrO					0.03
Cr_2O_3			0.15		0.28
NiO			0.15		
H_3PO_4				0.29	
Loss on Ignition				3.84	
Total	99.89	99.55 (98.87)	100.51	100.63	100.45
Less O≡ S, Cl	0.03		0.19		0.27
	99.86		100.32		100.18
Sp.gr.	2.892		3.160	2.927–3.005	

[1] With a little Co.

NORMS

	202	203	204	205	206
QTZ	–	–	–	–	–
CO	–	–	–	–	–
OR	–	–	.21	7.92	1.65
AB	–	–	.33	10.46	3.89
AN	12.89	3.14	2.77	24.20	5.06
LC	11.57	18.07	–	–	–
NE	46.05	71.26	–	16.26	–
KP	2.07	3.36	–	–	–
AP	.20	.13	.07	–	.60
RU	–	–	.22	2.19	–
IL	2.63	.28	.44	.54	.10
PY	.20	–	1.20	–	1.88
HE	–	–	5.98	9.80	–
MT	2.36	2.37	–	–	7.40
EN	–	–	21.92	–	13.20
FS	–	–	–	–	.12
OL	2.87	.96	65.20	4.15	35.89
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	19.11	.38	2.50	24.43	30.15
WO	–	–	–	–	–

forms, in places enclosing numerous minute needles of aegirite or apatite, and may show cancrinite, thomsonite, hydronephelite, or gieseckite as alteration products. Barkevikite replaces pyroxene in part, occurring as large poikilitic crystals. (M)

J.A. Allan (1914, p. 150)

203. **CONGRESSITE (PERKNITE).** Nepheline-rich phase of the Craigmont nepheline syenite body interfoliated with the other phases; "the Klondyke" openings for corundum near the west end of Robillard Mountain, Craigmont, Raglan tp., Renfrew co., Ont.

31–F–W½ (Anal. M.F. Connor) Ser. No. *1915–17*

Pale salmon-pink coloured rock owing to the incipient decomposition of the predominant nepheline. Parallel segregation of biotite and magnetite and white plagioclase in narrow streaks and bands give the rock a faint, though decided, foliation. Sodalite of a beautiful pale bluish colour is abundant in the nepheline as irregular streaks and patches. Muscovite, apatite, pyrite, and calcite are also present. (M)

A.E. Barlow (1915, p. 74)

204. **DUNITE.** Intrusive into biotite schist and andesitic breccia; McRae Creek, about 3 miles above its mouth, Christina Lake, Similkameen district, B.C.
82–E–E½ (Anal. M.F. Connor) Ser. No. *1912–53*

Massive, dark greenish grey, homogeneous rock, probably with a pod form of body. The olivine occurs in fairly fresh anhedra varying from 0.4 to 2 mm in greatest diameter. The alteration products are talc, tremolite, magnetite, and a little carbonate, probably dolomite. No chromite was recognized.

R.A. Daly (1912, p. 335)

205. **DIORITE.** Dyke in the reservoir extension at Montreal, Hochelaga co., Que.

31–H–W½ (Anal. B.J. Harrington) Ser. No. *1877–13*

Dark grey, homogeneous rock showing neither porphyritic nor amygdaloidal texture, and consisting essentially of hornblende and a triclinic feldspar, with numerous opaque grains of titanic iron, mica, apatite, calcite, and a green chloritic mineral also present. Hornblende is mostly fresh, in places slightly altered to the chloritic mineral, is of a rich brown colour, and occurs mostly in irregular grains. The feldspar is in part altered, in places fresh.

B.J. Harrington (1879, p. 44)

206. **SYENITE.** Basic facies of syenite intrusive in Couchiching and Keewatin series; northwest shore of Rocky Islet Bay, Rainy Lake, Rainy River district, Ont.

52–C–W½ (Anal. M.F. Connor) Ser. No. *1913–43*

	207	208	209	210	211
SiO_2	40.72	40.68	40.25	40.11	40.02
Al_2O_3	0.41	19.83	1.10	0.18	16.13
Fe_2O_3	9.44	4.68	4.61	3.05	
FeO	9.54	6.49	3.04	4.46	14.98
MgO	26.46	7.67	37.91	43.43	12.90
CaO	6.26	17.64	1.16	0.03	1.05
Na_2O	0.28	1.10	0.48		0.67
K_2O	0.13	0.27	0.16		8.17
H_2O+	3.98	0.27	9.08	7.52	2.82
H_2O-	0.18	0.08	0.32	0.22	0.13
TiO_2	0.29	2.04	trace	nil	0.46
P_2O_5	2.16				0.30
MnO	0.12	0.10	0.11	0.09	0.11
CO_2	0.26		1.95	nil	0.24
S	0.07			nil	0.39
Cl	0.05				
BaO	nil				
Cr_2O_3	0.31		0.15	0.36	
NiO	0.05			0.09	
CuO	0.07				
Total	100.78	100.85	100.32	99.54	98.37
Less O≡S, Cl	0.04				0.15
	100.74				98.22
Sp.gr.		3.14	2.868	2.91	

	NORMS			
	207	209	210	211
QTZ	–	–	–	–
CO	–	–	.13	5.56
OR	.78	.95	–	4.05
AB	1.49	4.35	–	–
AN	–	.37	.14	3.33
LC	–	–	–	36.44
NE	–	–	–	3.70
KP	–	–	–	–
AP	4.60	–	–	.64
RU	–	–	–	–
IL	.41	–	–	.65
PY	.18	–	–	1.04
HE	–	–	–	–
MT	10.03	4.69	3.42	–
EN	38.73	22.24	21.23	–
FS	4.16	.37	.84	–
OL	24.91	62.64	74.21	44.54
AC	.85	–	–	–
NSI	–	–	–	–
KSI	–	–	–	–
DI	13.82	4.35	–	–
WO	–	–	–	–

Coarse-grained, light-coloured rock showing distinct gneissic foliation due to original flow movement or to deformation. Composed chiefly of chlorite with a smaller proportion of an indeterminate prismatic mineral having characteristics of iron-free amphibole. Much magnetite occurs in the form of fine dust and also in nests. Calcite is fairly abundant. A very little original feldspar and quartz may be detected.

A.C. Lawson (1913, p. 91)

207. **PERIDOTITE.** Five Mile Lake, Opemisca map-area, Abitibi territory, Que.

32–G–W½ (Anal. R.J.C. Fabry) Ser. No. *1938–5*

Heavy, black, partly serpentinized peridotite showing 50% ± pyroxene and serpentine.

(G.W.H. Norman)

208. **ROUGEMONTITE (GABBRO).** Western half of Rougemont Mountain, Rouville and St. Hyacinthe counties, Que.

31–H–W½ (Anal. M.F. Connor) Ser. No. *1914–15*

Medium- to fine-grained, inequigranular, holocrystalline grey rock in which anorthite is the predominant mineral and which occurs in crystals varying in size with both albite and Carlsbad twinning. Iron ore occurs in irregular masses and small grains often surrounded by a narrow border of biotite. Olivine occurs in small rounded crystals with irregular cracks containing incipient serpentine. Titaniferous augite is the second most abundant mineral, and occurs in irregular crystals with well developed cleavage. Biotite and a small amount of brown hornblende associated with augite are also present. (M)

J.J. O'Neill (1914, p. 76)

209. **DUNITE.** One hundred foot wide dyke cutting Anarchist phyllite and associated rocks, in the deep gorge of Rock Creek, immediately below Baker Creek, Anarchist Mountain-Plateau, Similkameen district, B.C.

82–E–W½ (Anal. M. Dittrich) Ser. No. *1912–63*

Massive, compact, greenish-black rock mottled with abundant areas of rather pale green talc. Olivine is the only visible primary essential and occurs with its usual granular habit. Secondary products are serpentine, talc, tremolite, magnetite, and a carbonate, probably dolomite. Small grains of pyrite were doubtlessly introduced during the alteration of the rock.

R.A. Daly (1912, p. 394)

210. **PERIDOTITE.** Country rock of asbestos, from pit side about 150 feet below the original surface, Bell Pit, Thetford mines, Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1934–18*

Normal peridotite composed of large olivines, 4 to 6 mm, with a few pyroxenes 1½ to 2½ mm, both partly serpentinized.

H.C. Cooke (1937, p. 113)

211. **AUGITE PORPHYRITE.** Wall-rock of mineralized fissure veins; 4th level of the War Eagle mine, Rossland mining camp, east face of Red Mountain, Trail Creek mining division, West Kootenay district, B.C.

82–F–W½ (Anal. Mines Branch) Ser. No. *1915–38*

Rock is altered in the vein. Where unaltered, it is very dark greyish or greenish black, composed of phenocrysts of augite, hornblende, and plagioclase feldspars lying in a fine ground chiefly of plagioclase feldspar and hornblende.

C.W. Drysdale (1915b, p. 205) *See also* No. 157 *(1915–37)*

212. **YAMASKITE (PERKNITE).** Igneous core of Mount Yamaska, Rouville co., Que.

31–H–E½ (Anal. G.A. Young) Ser. No. *1904–3*

Black, coarse rock consisting almost entirely of large and small irregular individuals of pyroxene and hornblende, with much ilmenite and scarcely any feldspar, pyrite associated with the iron ore, and apatite in dusted crystals. Pyroxene individuals are generally rounded and surrounded by hornblende, and are commonly dark from dust-like inclusions. Hornblende is deep reddish brown, and mostly associated with the pyroxene. The small amount of anorthite present occurs in very small irregular aggregates. (M)

G.A. Young (1906, p. 31)

213. **PERIDOTITE.** Intrusive into the Caldwell Series (Cambrian ?); Vimy mine, Thetford, Ireland tp., Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1932–23*

Dark-grey rock, weathering reddish, characterized by porphyritic crystals of serpentinized pyroxene. Serpentine, secondary after olivine and an enstatite, forms about 50%, and perhaps 35% olivine and 15% enstatite remains unaltered. A little secondary magnetite and a few grains of picotite or chromite are also present.

H.C. Cooke (1937, p. 113) *See also* No. 430 *(1932–22)*

214. **PERIDOTITE.** Upper layer of the thick anticlinal sill of serpentinite; east on McNeill Lake, from about 400 feet from the top of the northeast limb, Que.

23–P–W½ (Anal. R.J.C. Fabry) Ser. No. *1951–20*

Rusty weathering, very black, partly decomposed rock commonly exhibiting pronounced flat-lying 'joints'. Partly serpentinized, containing fresh

	212	213	214	215	216
SiO_2	39.97	39.66	39.58	39.55	38.98
Al_2O_3	8.68	1.84	3.89	1.02	4.69
Fe_2O_3	8.63	4.07	3.89	2.72	4.29
FeO	7.99	3.92	4.73	4.33	7.71
MgO	10.32	39.96	34.62	39.30	31.56
CaO	15.18	1.52	1.76	3.85	3.26
Na_2O	1.19	0.29	0.04		1.03
K_2O	0.74	nil			0.96
H_2O+	0.57	7.51	9.94	8.75	4.86
H_2O-		0.38	0.16	0.44	0.09
TiO_2	4.05	nil	0.12	nil	0.56
P_2O_5	0.10	nil	0.10		
MnO	0.19		0.35	0.04	0.12
CO_2	1.15	nil	nil	0.37	1.40
S		0.05	0.07	0.14	
Cr_2O_3		0.13	0.05	0.33	
NiO		0.24	0.05	0.18	
FeS_2	1.01				
Total	99.77	99.57	99.35	101.02	99.75 (99.51)
Less O≡S		0.02	0.03	0.06	
		99.55	99.32	100.96	
Sp.gr.		2.90			

NORMS.

	212	213	214	215	216
QTZ	–	–	–	–	–
CO	–	–	.95	–	–
OR	4.64	–	–	–	5.63
AB	2.20	2.53	.36	–	3.62
AN	17.13	3.62	8.26	2.72	5.28
LC	–	–	–	–	–
NE	5.48	–	–	–	3.32
KP	–	–	–	–	–
AP	.22	–	.21	–	–
RU	–	–	–	–	–
IL	5.98	–	.17	–	.77
PY	1.01	.12	.18	.35	–
HE	–	–	–	–	–
MT	9.55	4.26	4.19	3.11	4.43
EN	–	14.86	30.89	8.10	–
FS	–	.45	1.57	.34	–
OL	4.99	71.13	53.17	72.55	68.29
AC	–	–	–	–	–
NSL	–	–	–	–	–
KSL	–	–	–	–	–
DI	49.77	2.98	–	12.79	8.62
WO	–	–	–	–	–

	217	218	219	220	221
SiO_2	38.24	38.16	37.84	37.33	37.32
Al_2O_3	0.70	0.63	2.73	7.27	19.30
Fe_2O_3	3.50	3.32	0.20	13.41	
FeO	4.25	4.76	5.22	9.24	16.10
MgO	41.92	41.84	44.69	12.27	10.81
CaO	0.68	0.68	0.16	16.50	1.47
Na_2O	) 0.20	) 0.20		0.45	0.33
K_2O				0.30	8.55
H_2O+	9.76	9.63	8.04	1.03	3.01
H_2O-	0.60	0.47	0.24	0.10	0.14
TiO_2	nil	nil		1.66	0.87
P_2O_5					0.19
MnO			0.09	0.07	0.10
CO_2			0.20		trace
S					0.56
Cr_2O_3			0.71		
NiO			0.19		
Total	99.85	99.69	100.31	99.63	98.75
Less O≡ S					0.20
					98.55

NORMS

	219	221
QTZ	–	–
CO	2.52	8.15
OR	–	–
AB	–	–
AN	.75	6.23
LC	–	33.92
NE	–	1.82
KP	–	5.81
AP	–	.40
RU	–	–
IL	–	1.24
PY	–	1.50
HE	–	–
MT	.90	–
EN	6.15	–
FS	.38	–
OL	89.26	40.87
AC	–	–
NSI	–	–
KSI	–	–
DI	–	–
WO	–	–

olivine and pyroxene, secondary brown hornblende, actinolite, chlorite, and garnierite.

(W.F. Fahrig) *See also* Nos. 385, 387, 389, 393, 444 *(1951–22) 19, 24, 23, 21)*

215. **PERIDOTITE.** Large stock-shaped body intruding Triassic sediments; on the ridge top to the east of the head of Camp Creek, less than 3 miles south-southeast of Pioneer mine, and about 3,000 to 3,500 feet above it; Bridge River mining camp, Lillooet district, B.C.

92–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1935–23*

A dark-green to greenish-grey, massive, brownish-red weathering porphyritic, partly serpentinized, undeformed rock. About 75% consists of about equal amounts of clear colourless olivine aggregates and mesh antigorite. Much of the rest is composed of a brownish secondary mineral probably bastite, replacing phenocrysts of enstatite, no relics of which remain. There is conspicuous amount of brown spinel intergrown with magnetite.

C.E. Cairnes (1937, p. 29) *See also* Nos. 180, 438, 442, 488 *(1935–24, 22, 21, 25)*

216. **WHERLITE.** Buckingham tp., rge. 12, lot 18, Papineau co., Que.

21–G–W½ (Anal. M.E. Connor) Ser. No. *1926–18*

M.E. Wilson (1926, p. 29)

217. **DUNITE.** Ireland tp., rge. 2, lot 28, Megantic co., Que.

21–L–W½ (Anal. M.F. Connor) Ser. No. *1913–6*

Dark green rock containing narrow bands of serpentine along joints and other crevices that carry asbestos veins. Olivine, composing 90% of the rock, occurs in crystals of fairly uniform size, which are generally reduced to serpentine in thin films covering the faces. Minor amounts of pyroxene occur in larger crystals, which locally enclose the olivine. Accessory amounts of magnetite and chlorite are present.

J.A. Dresser (1913, p. 28) *See also* Nos. 218, 434, 1073 *(1913–2, 3, 1)*

218. **DUNITE.** Near Black Lake Station, Ireland tp., Megantic co., Que.

21–L–W½ (Anal. M.F. Connor) Ser. No. *1913–2*

Dark green rock containing narrow bands of serpentine along joints and other crevices that carry asbestos veins. Olivine, composing 90% of the rock, occurs in crystals of fairly uniform size, which are usually reduced to serpentine in thin films covering the faces. Minor amounts of pyroxene occur in larger crystals, which in places enclose the olivine. Accessory amounts of magnetite and chlorite are present.

J.A. Dresser (1913, p. 28) *See also* Nos. 217, 434, 1073 *(1913–6, 3, 1)*

	222	223	224	225
SiO_2	36.99	36.24	33.48	12.10
Al_2O_3	2.63	9.05	1.50	6.82
Fe_2O_3	1.94	10.64	7.27	2.94
FeO	3.54	9.58	1.36	
MgO	44.72	7.75	42.02	1.18
CaO	0.10	14.97	0.02	30.45
Na_2O		1.05	) 0.29	5.21
K_2O		0.43		3.08
H_2O+	9.00	) 0.65	13.26	
H_2O-	0.49		0.60	
TiO_2		7.12		
P_2O_5		0.01		
MnO	0.07	0.29	0.06	
CO_2	0.50			
SO_3				16.13
F				18.58
SrO				11.44
Cr_2O_3	0.56			
NiO	0.26			
FeS_2		0.97		
Total	100.80	99.75	99.86	107.93
Less O≡ F		(98.75)		7.82
				100.11

NORMS

	222	223
QTZ	–	–
CO	2.56	–
OR	–	2.78
AB	–	2.22
AN	.47	20.43
LC	–	–
NE	–	4.84
KP	–	–
AP	–	02
RU	–	–
IL	–	10.82
PY	–	–
HE	–	2.23
MT	2.50	8.78
EN	7.35	–
FS	.24	–
OL	86.85	–
AC	–	–
NSI	–	–
KSI	–	–
DI	–	47.11
WO	–	.74

219. **PERIDOTITE.** Normal rock taken from about 1½ inches from the vein, Frechette chromite pit, Block A, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1935–8*

Dark grey serpentinized peridotite, which is cut by a vein of fairly massive chromite ⅛ to ½ inch thick, and is altered along the margins of the vein over a width of about ⅛ inch to a bright yellow green material, which gradually fades into the normal dark grey rock.

(H.C. Cooke) *See also* No. 154 *(1938–9)*

220. **PYROXENITE.** Irregular stock-like body of variable width; summit of the ridge south of Olivine Mountain, Tulameen map-area, Yale district, B.C.

92–H–E½ (Anal. M.F. Connor) Ser. No. *1913–19*

Black or dark green rock variable in composition and texture and cut by coarse pegmatite dykes of hornblende, and by quartz and calcite veins. Augite and magnetite are the only constituents visible in hand specimen. Light-coloured, large crystals of augite are the most abundant, and often the only essential mineral. The latter tends to alter to hornblende and later to chlorite or serpentine. Hornblende is also primary. Magnetite occurs interstitially and as small grains symmetrically arranged throughout the augite.

C. Camsell (1913, p. 61)

221. **MONZONITE.** Mineralized monzonite; 700-foot level of the Le Roi mine, Rossland mining camp, Kootenay district, B.C.

82–F–W½ (Anal. M.F. Connor) Ser. No. *1915–39*

C.W. Drysdale (1915b, p. 223) *See also* No. 132 *(1912–55)*

222. **PERIDOTITE.** Immediate vicinity of chromite vein, Frechette chromite pit, Block A, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1935–9*

Bright yellow-green material along the margin of a massive chromite vein, ⅛ to ½ inch thick, cutting ordinary, partly serpentinized peridotite. The altered material extends from the vein for about ⅛ inch and fades gradually into the normal dark grey peridotite. It consists of olivine with a little enstatite, about half replaced by the yellow-green material, which may be chlorite secondary after antigorite.

(H.C. Cooke) *See also* No. 219 *(1935–8)*

223. **YAMASKITE (GABBRO).** Igneous core of Mt. Yamaska, Rouville co., Que.

31–H–E½ (Anal. G.A. Young) Ser. No. *1904–4*

Black rock containing a considerable amount of feldspar. Pyroxene is most abundant mineral and occurs in rounded individuals frequently surrounded by hornblende and commonly dark from dust-like inclusions.

Deep reddish brown, basaltic hornblende is mostly associated with the pyroxene. Feldspar forms large, distinctly idiomorphic laths often arranged parallel to one another and penetrating hornblende. Large irregular grains of iron ore, pyrite associated with the iron ore, and dusted crystals of apatite are also present.

G.A. Young (1906, p. 31)

224. **DUNITE.** Large peridotite body that extends from Olivine Mountain northwest across Tulameen Valley to Grasshopper Mountain from a point near the summit of Olivine Mountain near Tulameen, Yale district, B.C.

92–H–E½ (Anal. M.F. Connor) Ser. No. *1913–14*

Massive, dense, black or dark greenish rock, largely altered to serpentine, and consisting of olivine and chromite. Olivine in the partly serpentinized parts occurs in rounded grains separated from each other by irregular lines of serpentine. Where alteration has been extreme nothing remains but a dense mat of serpentine fibres. Chromite occurs in scattered large crystals or rounded grains strung out in lines. Diamond, platinum, and some gold are locally associated with the chromite in veins and bunches. Small veins of asbestos traverse serpentinized parts.

C. Camsell (1913, p. 53)

225. **PORPHYRY.** Best looking material on top of the 4,200-foot knob just above and south of the Smuggler fluorspar workings, on the ridge on the east side of Foghorn Creek, 3 miles by trail from Birch Island, Kamloops district, B.C.

82–M–W½ (Anal. Dept. Mines, Ottawa) Ser. No. *1930–25*

Crushed porphyry of aplitic (?) composition having rounded and crushed feldspar phenocrysts and exhibiting a somewhat foliated structure. Fluorspar and celestite are intimately intergrown, and disseminated pyrite appears to have been introduced after the crystallization of the rock-forming minerals. The fluorspar varies from a fine-grained, dark purple variety forming a large percentage of the rock mass to a more coarsely crystalline variety in grains up to ¼ inch in diameter disseminated through the rock.

J.F. Walker (1931, p. 148)

Intrusive Rocks, Partial Analyses

226. **ALASKITE.** Four hundred feet south of Lost Mine Vein, Eagle Prospect, Goldfields, Sask.

74–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1952–2*

Fine-grained, brecciated, red alaskite in which the feldspar crystals can be observed. White quartz eyes are also visible. Green chlorite, calcite, and albite form cement.

SiO_2 76.97%, Fe_2O_3 3.20%, MgO 0.61%, CaO 1.38%, Na_2O 2.50%, K_2O 0.26%, Sp.G. 2.675.

(K.R. Dawson)

227. **QUARTZ-EYE GRANITE.** Central part of body; 4,600 feet south of the east end of Alberta Lake, Weldon Bay area, Man.

63–K–W½ (Anal. R.J.C. Fabry) Ser. No. *1950–7*

Intermediate in texture between porphyritic and non-porphyritic varieties and containing large quartz grains, lesser amounts of plagioclase, sericite, amphibole, epidote, and light brownish green to green chlorite (penninite). Quartz is strained and shows some mortar structure. SiO_2 76.09%, Al_2O_3 12.88%, Fe_2O_3 3.99%, Na_2O 4.18%, K_2O 1.04%, TiO_2 0.21%, P_2O_5 0.14%.

J. Kalliokoski (1952, p. 12 and laboratory files)

228. **ALASKITE (GRANODIORITE).** Intrusive in a sedimentary series; 200 feet south of the Lost Mine Vein, Eagle Prospect, Goldfields, Sask.

74–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1952–1*

Fine-grained, red rock, containing some ribbon quartz, and veined by calcite and albite. Specularite and kaolinite are also present. SiO_2 74.57%, Fe_2O_3 1.81%, MgO 0.15%, CaO 1.12%, Na_2O 3.34%, K_2O 0.90%, Sp. G. 2.644.

(K.R. Dawson)

229. **GRANITE (GRANODIORITE).** Near Lost Mine Vein, Eagle Prospect, Eldorado Mining and Refining Co., Goldfields, Sask.

74–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1952–3*

Fine-grained red rock derived by the crushing of the original constituents of an intrusive alaskite to a fine mortar containing slivers of quartz and feldspar fragments, and veined by hematite, chlorite, and calcite.

SiO_2 73.81%, Fe_2O_3 5.81%, MgO 0.75%, CaO 0.71%, Na_2O 3.06%, K_2O 0.22%,

(K.R. Dawson)

230. **QUARTZ-EYE GRANITE (GRANODIORITE).** Central part of granite mass; 3,800 feet east of Alberts Lake, Weldon Bay area, Man.

63–K–W½ (Anal. R.J.C. Fabry) Ser. No. *1950–8*

Typical quartz-eye granite showing good eyes on weathered surface. Contains large quartz grains, plagioclase full of inclusions, clusters of garnets, dark green hornblende, penninite (replacing biotite), apatite, carbonate, and tourmaline. Quartz forms 49%, plagioclase 38.9%, and iron-magnesium minerals 11.9%.

SiO_2 73.16%, Al_2O_3 12.69%, Fe_2O_3 4.80%, Na_2O 2.52%, K_2O 0.66%, TiO_2 0.21%, P_2O_5 0.16%.

J. Kalliokoski (1952, p. 12)

231. **OLIGOCLASE GRANITE (GRANODIORITE).** Three hundred feet west from shore, opposite the north end of the larger island, Nistisap Lake, Weldon Bay area, Man.

63–K–W½ (Anal. R.J.C. Fabry) Ser. No. *1950–14*

Massive rock containing plagioclase, quartz, biotite, hornblende, apatite, epidote, and carbonate. (M)

SiO_2 61.21%, Al_2O_3 17.80%, Fe_2O_3 5.97%, Na_2O 4.32%, K_2O 1.54%, TiO_2 0.84%, P_2O_5 0.28%,

(J. Kalliokoski)

232. **GRANITE PORPHYRY.** At the observation tower, 700 feet east of south bay, Cliff Lake, Flin Flon, Man.

63–K–W½ (Anal. R.J.C. Fabry) Ser. No. *1950–9*

SiO_2 69.14%, Al_2O_3 14.64%, Fe_2O_3 5.18%, Na_2O 3.10%, K_2O 0.62%, TiO_2 0.57%, P_2O_5 0.14%.

(C.H. Stockwell)

233. **PHONOLITE.** Dyke associated with trachytic dykes; Lachine, Montreal Island, Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1856–9*

Brittle, somewhat schistose rock consisting of a reddish-fawn feldspathic base in which are disseminated greenish-white, rounded masses, often grouped and apparently concretionary in nature. The feldspathic residues from two specimens were analyzed.

(a) SiO_2 59.70%, Al_2O_3 23.25%, CaO 0.99%, potash 9.16%, soda 2.97%, volatiles 2.23%.

(b) SiO_2 60.90%, Al_2O_3 24.45%, CaO 0.45%, potash and soda undetermined, volatiles 2.10%.

T.S. Hunt (1857c, p. 493)

234. **MICRODIORITE.** Elliptical stock, some apophyses; intrudes volcanic series of the tops of the hills on either side of Wrinch Canyon, between George Lake and Cole Lake, Owen Lake mining camp, B.C.

93–L–E½ (Anal. A.H. Phillips) Ser. No. *1929–15*

Fine-grained, massive, dark greenish-black rock often with a fine-grained porphyritic texture. Abundant lath-shaped phenocrysts of plagioclase (labradorite or labradorite-andesine) averaging 1 to 2 mm in length,

lying in a fine-grained groundmass consisting of anhedral plagioclase and some interstitial quartz. Accessory hornblende and biotite occur sparingly. Numerous pyrite grains are present.
SiO_2 57.59%, Al_2O_3 18.83%, total Fe as Fe_2O_3 6.67%, MgO 1.98%, CaO 5.03%.

A.H. Lang (1930, p. 74)

235. **DOLERITE.** Intrusive in eruptive rock in the Laurentian series; Grenville, Argenteuil co., Que.

31–G–E½ (Anal. T.S. Hunt) Ser. No. *1858–6*

Greenish black, very fine-grained rock, containing small brilliant black grains of ilmenite, sphene, small scales of mica, small cleavable masses of white carbonate of lime, and occasional masses of black cleavable augite. The portion of the rock insoluble in dilute nitric acid, 84.30%, was analyzed.
SiO_2 52.20%, Al_2O_3 18.50%, Fe_2O_3 10.00%, MgO 4.17%, CaO 7.34%, potash 2.14%, soda 2.41%, volatiles 2.50%, total 99.26%.

T.S. Hunt (1859, p. 192)

236. **ALBITITE.** Occurs as lenses in the foot-wall of the St. Louis fault, 200 feet east of the Ace Lake Shaft, Goldfields, Sask.

74–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1952–4*

Cherty-appearing red rock, consisting essentially of albite and minor amounts of quartz. A few shreds of chlorite are the only mafic mineral present. A few coarser individuals lie in a fine-grained matrix. Pyrite, hematite, calcite, sphene, and sericite are also present.
SiO_2 48.01%, Fe_2O_3 6.68%, MgO 2.86%, CaO 9.04%, Na_2O 4.12%, K_2O 0.68%.

(K.R. Dawson)

237. **DYKE.** Overlies a ferruginous bed, Piedmont Iron Ore, Colchester co., Nova Scotia.

11–E–W½ (Anal. H.A. Leverin) Ser. No. *1916–15*

Green rock composed of plagioclase feldspar and calcite.

SiO_2 42.51%, CaO 6.46%, Fe (total) 6.02%, P_2O_5 21%.

A.O. Hayes (1917, p. 277)

238. **DOLERITE.** Forms the greater part of the mountain, Montarville, Chambly co., Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1858–4*

Consists of olivine in rounded crystalline masses, associated with white or greenish-white crystalline feldspar, black augite, and a little brown mica and magnetic iron.

(a) acid soluble portion: SiO_2 37.30%, Al_2O_3 3.00%, FeO 26.20%, MgO 33.50%.
(b) acid insoluble portion: SiO_2 49.35%, Al_2O_3 18.92%, FeO 4.51%, MgO 6.36%, CaO 18.36%, loss 2.50%.

T.S. Hunt (1859, pp. 182–183)

239. **GRANITE.** Brûlé Bay, Lake Superior, Ont.

41–N–E½ (Anal. A.F. Matheson) Ser. No. *1932–29*

Massive, red granite, medium to coarse grain, very similar in texture to the grey granite with which it occurs. It is fresh looking rock, with few irregular pegmatites observed. Consists of plagioclase near oligoclase, orthoclase, a little microcline, and 25–30% quartz. There are few accessories, and the alteration products kaolin, epidote, sericite, chlorite, and leucoxene form not over 7% of the rock.
Fe_2O_3 0.11%, FeO 0.37%, Na_2O 4.39%, K_2O 3.62%.

A.F. Matheson (1933, p. 6)

240. **GRANITE.** In contact with grey granite, ½ mile west of Doré Point, Lake Superior, Ont.

41–N–E½ (Anal. A.F. Matheson) Ser. No. *1932–31*

Massive, red rock of medium to coarse grain, but very similar in texture to the grey granite with which it is in contact. It is fresh looking rock, with few irregular pegmatites observed. Consists of plagioclase near oligoclase, orthoclase, and a little microcline, and 25–30% quartz. Few accessories are present, and the alteration products kaolin, epidote, sericite, chlorite, and leucoxene form not over 7% of the rock.
Fe_2O_3 0.25%, FeO 1.00%, Na_2O 4.23%, K_2O 3.93%.

A.F. Matheson (1933, p. 6)

241. **GRANITE (GRANODIORITE).** Southwest corner of tp. 28, rge. 23, Michipicoten area, Lake Superior, Ont.

41–N–E½ (Anal. Dr. Gledhill) Ser. No. *1932–28*

Commonly massive or slightly gneissoid, equigranular, medium-grained, grey granite becoming darker grey near contact. Pegmatites and aplites are common and have very distinct walls. Consists of 60% acidic plagioclase, 12% orthoclase, 26% quartz, and 2% biotite. Microcline and some medium plagioclase are also present but nowhere abundant. Accessories are common.
Fe_2O_3 1.24%, FeO 1.33%, Na_2O 3.08%, K_2O 1.70%.

A.F. Matheson (1933, p. 6)

242. **GRANITE (GRANODIORITE).** Half mile northeast of Sand Lake, Michipicoten River, Ont.

41–N–E½ (Anal. A.F. Matheson) Ser. No. *1932–27*

Description same as No. 241.
Na_2O 5.66%, K_2O 0.77%.

A.F. Matheson (1933, p. 6)

243. **GRANITE (GRANODIORITE).** In contact with red granite, ½ mile west of Doré Point, Lake Superior, Ont.

41–N–E½ (Anal. A.F. Matheson) Ser. No. *1932–32*

Description same as No. 241.
Na_2O 4.61%, K_2O 0.57%.

A.F. Matheson (1933, p. 6)

244. **GABBRO.** From the negative anomaly near magnetic station L_{10}, Yamaska Mountain, Rouville co., Que.

31–H–W½ (Anal. J.A. Maxwell) Ser. No. *1954–33*

The rock, containing clinopyroxene, plagioclase, spinel, and opaque ore, was finely crushed and the magnetic part separated by a hand magnet for analysis.
Fe_2O_3 40.0%, FeO 28.4%, TiO_2 8.1%.

(R. Mitra)

245. **GABBRO.** From the negative anomaly of magnetic station P_{13}, Yamaska Mountain, Rouville co., Que.

31–H–W½ (Anal. J.A. Maxwell) Ser. No. *1954–34*

A rock consisting of clinopyroxene, plagioclase, spinel ?, biotite, and opaque ore was finely crushed, and the magnetic part separated by a hand magnet for analysis.
Fe_2O_3 47.7%, FeO 24.5%, TiO_2 6.6%.

(R. Mitra)

246. **GABBRO.** From the positive anomaly of the magnetic station L_4, Yamaska Mountain, Rouville co., Que.

31–H–W½ (Anal. J.A. Maxwell) Ser. No. *1954–35*

Rock consisting of clinopyroxene, plagioclase, olivine, spinel, biotite, and opaque ore was finely crushed and the magnetic part separated by a hand magnet for analysis.
Fe_2O_3 39.3%, FeO 31.0%, TiO_2 10.7%.

(R. Mitra)

247. **GABBRO.** From the positive anomaly on hill M, Yamaska Mountain, Rouville co., Que.

31–H–W½ (Anal. J.A. Maxwell) Ser. No. *1954–36*

Rock consisting of clinopyroxene, plagioclase, hornblende, biotite, sphene, alteration products (carbonate, chlorite, etc.), and opaque iron ore was finely crushed and the magnetic part separated by a hand magnet for analysis.

Fe_2O_3 45.2%, FeO 29.1%, TiO_2 8.7%.

(R. Mitra)

248. **GABBRO.** From the positive anomaly on hill M, Yamaska Mountain, Rouville co., Que.

31–H–W½ (Anal. J.A. Maxwell) Ser. No. *1954–37*

Rock consisting of clinopyroxene, plagioclase, hornblende, apatite, sphene, alteration products (white mica, limonite, etc.), and opaque iron ore was finely crushed and the magnetic part separated by a hand magnet for analysis.

Fe_2O_3 52.0%, FeO 28.7%, TiO_2 6.5%.

(R. Mitra)

249. **GABBRO.** From the negative anomaly of magnetic station P_{13}, Yamaska Mountain, Rouville co., Que.

31–H–W½ (Anal. J.A. Maxwell) Ser. No. *1954–41*

Rock consisting of clinopyroxene, plagioclase, spinel ?, biotite, and opaque ore was finely crushed, and passed through Clerici's solution (G–3.4); from the 'sink' fraction a magnetic part was separated by a hand magnet, and the rest was analyzed.

SiO_2 3.9%, Al_2O_3 4.1%, Fe_2O_3 8.4%, FeO 26.3%, MgO 7.8%, CaO 4.2%, TiO_2 39.5%.

(R. Mitra)

Extrusive Rocks

250. **PETROSILEX OR EURITE (FELSITE).** Associated with serpentine; Orford tp., rge. 16, lot 6, Sherbrooke co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1856–20*

Homogeneous, compact, greenish-, or whitish-grey rock with scaly conchoidal fracture and dull waxy lustre.

T.S. Hunt (1857c, p. 457)

251. **TUFF.** Southeast ridge of Tahsis Mountain, Zeballos, Vancouver Island, B.C.

92–E–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–5*

	250	251	252	253(a)	253 (b)
SiO_2	78.40	75.87	73.22	73.32	73.00
Al_2O_3	11.81	10.98	13.46	11.91	12.34
Fe_2O_3		0.96	2.33	1.05	1.08
FeO	0.72	2.35	0.96		
MgO	0.77	0.68	0.42	0.31	0.20
CaO	0.84	0.67	1.50	0.57	0.48
Na_2O	4.42	3.35	5.46	4.42	4.56
K_2O	1.93	3.03	1.74	4.48	4.38
H_2O+		0.50	0.62	3.86	3.79
H_2O-		0.48		0.23	0.14
TiO_2		0.53	0.28		
P_2O_5		0.08	0.10		
MnO		0.01	trace		
CO_2		0.42			
S................		0.03			
SO_3			trace		
ignition loss	0.90				
Total	99.79	99.94	100.09	100.15	100.07 (99.97)
Less O≡ S		0.01			
		99.03			
Sp.gr.	2.635-2.639		2.68-2.70		

NORMS

	250	251	252
QTZ	39.43	39.77	29.26
CO	1.01	1.30	.10
OR	11.62	18.58	10.38
AB	40.36	31.14	49.41
AN	4.24	2.90	6.85
LC	–	–	–
NE	–	–	–
KP	–	–	–
AP	–	.17	.21
RU	–	–	–
IL	–	.76	.39
PY	–	.08	–
HE	–	–	.53
MT	–	1.03	1.65
EN	2.17	1.95	1.17
FS	1.13	2.26	–
OL	–	–	–
AC	–	–	–
NSI	–	–	–
KSI	–	–	–
DI	–	–	–
WO	–	–	–

	254	255	256	257	258
SiO_2	71.40	70.37	66.91	80.80	78.06
Al_2O_3	13.60	11.27	19.01	5.96	12.88
Fe_2O_3		0.80	3.70	1.42	0.74
FeO	3.24	2.58	1.79		0.73
MgO	2.40	2.03	0.59	0.54	0.86
CaO	0.84	2.31	0.35	0.36	0.44
Na_2O	3.31	2.63	4.62		1.55
K_2O	2.37	1.86	1.44		2.67
H_2O+			0.64		1.88
H_2O-		) 1.96	0.20	) 11.00	0.25
TiO_2		0.17	0.27	0.30	
P_2O_5					
MnO					
CO_2		3.60	0.26		
ignition loss	2.50				
Total	99.66	99.58	99.78	100.38	100.06

NORMS

	254	255	256	257	258
QTZ	33.64	38.45	31.13	87.73	54.87
CO	4.58	.84	10.24	6.91	7.60
OR	14.54	11.93	8.68	–	16.61
AB	30.79	25.58	42.26	–	14.62
AN	4.32	12.43	1.77	2.13	2.29
LC	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	–	–	–	–	–
RU	–	–	–	.24	–
IL	–	.25	.38	–	–
PY	–	–	–	–	–
HE	–	–	.18	1.17	–
MT	–	.90	3.65	–	–
EN	6.92	6.12	1.67	1.79	2.51
FS	5.19	3.46	–	–	.64
OL	–	–	–	–	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	–	–	–
WO	–	–	–	–	–

Dull, grey green, very fine grained feldspathic tuff containing very small fragments of feldspar in a matrix of volcanic dust.

J.W. Hoadley (1953, p. 26)

252. **DACITE TUFF (QUARTZ LATITE).** Occurs with feldspathic andesites and is intruded by feldspathic quartz diorite; tuff and andesite make up the large part of the peninsula that juts out between Kokshittle Arm and Easy Creek, 1 mile southeast of Monteith Bay, northwest part of Kyuquot Sound, Vancouver Island, B.C.

92–L–W½ (Anal. N.L. Turner) Ser. No. *1913–55*

Dense, slightly altered, dark reddish rock consisting largely of albite oligoclase (about $Ab_{85}An_{15}$). Original hornblende has been completely altered to chlorite, epidote, and calcite. Essential quartz is present. (M)

C.H. Clapp (1914b, p. 118) *See also* Nos. 401, 402, 406, 409, 414 *(1913–56, 57, 58, 60, 59)*

253a. **PERLITE.** Lava flow, 30 feet thick, overlain by greyish white rhyolite, and underlain by a dark brown rhyolite. On the shore of Francois Lake, Fort St. James map-area, Cassiar and Coast district, B.C.

93–K–W½ (Anal. ?) Ser. No. *1949–9*

Smoky, glassy flow with grey opaque appearance on the weathered surface.

J.E. Armstrong (1949, p. 199)

253b. **PERLITE.** Lava flow, 30 feet thick, overlain by greyish white rhyolite, and underlain by a dark brown rhyolite. 1,000 feet above the shore of François Lake, Fort St. James map-area, Cassiar and Coast district, B.C.

93–K–W½ (Anal. ?) Ser. No. *1949–9*

Smoky, glassy flow with grey opaque appearance on the weathered surface.

J.E. Armstrong (1949, p. 199)

254. **PETROSILEX OR EURITE (FELSITE).** Interstratified with bright green shales; near the falls of the Etchemin River, Lévis co., Que.

21–L–W½ (Anal. T.S. Hunt) Ser. No. *1856–21*

Fine-grained, pale greenish white or olive-green rock.

T.S. Hunt (1857c, p. 458)

255. **QUARTZ PORPHYRY.** Volcanic rock from a copper-bearing series of Pre-cambrian age; from quarry at Sherbrooke, Sherbrooke co., Que.

21–E–W½ (Anal. M.F. Connor) Ser. No. *1907–2*

	259	260	261	262	263
SiO_2	63.94	62.80	60.72	60.34	59.06
Al_2O_3	16.34	17.42	18.45	18.10	16.24
Fe_2O_3	3.57	3.40	0.14	2.71	0.43
FeO		3.35	5.63	1.28	4.88
MgO	1.38	1.88	2.90	1.36	3.51
CaO	3.18	nil	2.44	1.82	5.59
Na_2O	) 8.39[1]	1.30	2.35	5.25	2.84
K_2O		4.63	2.80	7.35	3.95
H_2O+	) 2.75	1.81	2.82	) 1.25	0.19
H_2O-		0.11	0.06		0.21
TiO_2	0.45	0.33	0.88	1.00	1.08
P_2O_5		0.02			0.21
MnO		nil	0.38	0.05	0.20
CO_2		1.10	trace		0.70
S		1.06[2]			
SO_3		nil			
C		1.25			
SrO					0.12
BaO					0.11
As		nil			
Total	100.00	100.46	99.57	100.51	99.32
Less O≡S		0.46			
		100.00			
Sp. gr.					2.796

NORMS

	259	260	261	262	263
QTZ			21.75	–	8.21
CO			8.08	–	–
OR			17.30	43.01	23.84
AB			22.01	40.45	25.98
AN			12.65	4.01	20.25
LC			–	–	–
NE			–	3.67	–
KP			–	–	–
AP			–	–	.44
RU			–	–	–
IL			1.27	1.37	1.53
PY			–	–	–
HE			–	1.20	–
MT			.15	.98	.45
EN			8.42	–	9.95
FS			8.32	–	6.17
OL			–	1.32	–
AC			–	–	–
NSI			–	–	–
KSI			–	–	–
DI			–	3.94	–
WO			–	–	3.13

[1] By difference
[2] Contains 9.96% S in pyrrhotite

Highly altered, light grey, porphyritic rock with phenocrysts of quartz and feldspar in a finely crystalline base. The feldspar is both orthoclase and plagioclase, the orthoclase being more abundant. Small rod-like bodies of colourless mica are present as well as irregular areas of rhombohedral carbonate, which is apparently dolomite.

J.A. Dresser (1907, p. 23)

256. **DACITE.** A member of the Abitibi volcanics; Dufresnoy Lake, Dufresnoy tp., Timiskaming co., Que.

32–D–E½ (Anal. S.J. Lloyd) Ser. No. *1914–1*

A dark green rock in which the feldspars are largely replaced by carbonate, zoisite, epidote, and sericite. The original pyroxene has disappeared entirely or just remains as a residual core in the midst of secondary hornblende.

M.E. Wilson (1913, p. 47)

257. **VOLCANIC ASH AND DIATOMACEOUS EARTH.** Deadman River, north of Savona, B.C.

92–I–E½ (Anal. M.F. Connor) Ser. No. *1916–5*

C.W. Drysdale (1917, p. 53)

258. **FELSITE.** Near Hay Cove, Red Islands, Richmond co., N.S.

11–F–E½ (Anal. F.G. Wait) Ser. No. *1900–12*

Pale yellowish to greenish rock of Precambrian age, which weathers a light purplish brown.

G.C. Hoffmann (1903, p. 23)

259. **PUMICE.** Bridge River district, Lillooet, B.C.

92–J–E½ (Anal. M.F. Connor) Ser. No. *1916–7*

White andesitic pumice, which occurs in great quantities as the most recent formation of the district.

C.W. Drysdale (1917, p. 53)

260. **TUFF.** From the 'graphite fault' shear zone, 1,000-foot level, Canadian Associated Goldfields mine, near mine station 1010, claim T.C. 699, southern part of McVittie tp., Timiskaming district, Ont.

32–D–W½ (Anal. E.A. Thompson) Ser. No. *1927–20*

Partly sheared black tuff, whose minerals are too obscured by graphite for identification.

H.C. Cooke (1927, p. 24) *See also* Nos. 266, 267, 268, 269, 323, 325, 411, 421 *(1927–16, 17, 18, 19, 21, 22, 23, 24)*

261. **CHERTY TUFF.** Coronation Canyon, west of Stuart Channel, Vancouver Island, B.C.

92–B–W½ (Anal. N.L. Turner) Ser. No. *1917–14*

Hard, microcrystalline, fine-grained, well-bedded, uniform, colourless rock, which is only slightly altered to secondary products. It consists largely of plagioclase feldspar (oligoclase albite to oligoclase) and quartz, with some orthoclase either free or included in the plagioclase. The tuffaceous nature of the rock is emphasized by the presence of larger, angular fragments of quartz, feldspar, or hornblende. Chlorite, pyrite, and ilmenite are accessories.

C.H. Clapp (1917, p. 141)

262. **TRACHYTE.** Youngest flow rock of the district, forming cappings to three mountains; east slope of McKinley Mountain, Franklin mining district, B.C.

82–E–E½ (Anal. Mines Branch) Ser. No. *1915–15*

Dense, holocrystalline, light to dark grey rock. Feldspar and biotite phenocrysts are enclosed in a groundmass composed of a felted mass of the same minerals with trachytoid structure and fluxional arrangement. The feldspar is labradorite, and orthoclase in small prisms. Prominent prismoids of apatite, and small disseminated and octahedral grains of magnetite are also present. Nephelite is present, and must be as minute interstitial fillings.

C.W. Drysdale (1915a, p. 126)

263. **AUGITE BIOTITE LATITE.** Lava of the Rossland Volcanic Group; from the ridge joining Record and Sophie Mountains, at a point 2 miles north of the Dewdney trail, Rossland Mountain Group, B.C.

82–F–W½ (Anal. M.F. Connor) Ser. No. *1912–50*

Massive, compact, deep greenish grey rock with numerous small phenocrysts of deep brown biotite, labradorite, and uralitized augite embedded in a base originally hyalopilitic. Advanced alteration of the base has led to formation of kaolin, uralite, sericite, epidote, zoisite, chlorite, carbonate, and a little quartz.

R.A. Daly (1912, p. 327) *See also* Nos. 263, 271 *(1912–50, 49)*

264. **ANDESITE.** Bonanza Group, north shore of Zeballos Inlet, opposite Esperanza Inlet, Vancouver Island, B.C.

92–E–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–6*

Dark red, fine-grained rock.

J.W. Hoadley (1953, p. 25)

	264	265	266	267	268
SiO_2	58.79	58.67	58.40	58.20	58.20
Al_2O_3	15.69	15.67	16.49	17.81	17.30
Fe_2O_3	4.26	2.85	1.92	3.50	4.42
FeO	3.89	3.28	4.67	5.95	5.11
MgO	2.28	3.86	2.76	1.85	1.52
CaO	4.12	5.33	1.65	0.80	1.50
Na_2O	3.02	4.77	2.69	1.38	1.76
K_2O	1.84	3.08	3.23	3.66	3.91
H_2O+	3.55	0.54	2.40	1.60	1.60
H_2O-	0.25	0.02	0.50	0.05	0.10
TiO_2	0.58	1.00	0.23	0.66	0.74
P_2O_5	0.40	0.16	0.03	0.02	0.01
MnO	0.04	0.11	nil	nil	nil
CO_2	1.42		2.75	1.70	1.40
S	0.16		1.21[1]	1.78[2]	1.38[3]
SO_3			nil	nil	nil
C			1.02	1.39	1.31
SrO		0.09			
BaO		0.11			
As			nil	nil	nil
Total	100.29	99.54	99.95	100.35	100.26
Less O≡S	0.06		0.46	0.68	0.53
	100.23		99.49	99.67	99.73
Sp. gr.		2.75			

NORMS

	264	265	266	267	268
QTZ	21.81	3.75	20.78	29.79	26.37
CO	2.54	–	6.56	11.76	8.63
OR	11.64	18.23	20.44	23.00	24.57
AB	28.98	42.80	25.81	13.14	16.77
AN	19.09	12.22	8.55	4.08	7.84
LC	–	–	–	–	–
NE	–	–	–	–	–
KP	–	–	–	–	–
AP	.89	.33	.06	.04	.02
RU	–	–	–	–	–
IL	.86	1.39	.34	.97	1.09
PY	.44	–	3.37	4.92	3.82
HE	–	–	–	–	–
MT	4.75	2.97	2.14	3.87	4.89
EN	6.78	10.73	8.21	5.46	4.48
FS	2.16	1.86	3.69	2.91	1.48
OL	–	–	–	–	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	–	–	–
WO	–	5.68	–	–	–
GR[4]	–	–	1.02	1.39	1.84

[1]Contains 0.04% S in pyrrhotite
[2]Contains 0.11% S in ”
[3]Contains 0.07% S in ”
[4]GR = graphite

	269	270	271	272	273
SiO_2	57.80	55.69	54.54	54.19	54.04
Al_2O_3............	16.12	18.25	18.10	17.45	18.86
Fe_2O_3............	1.28	2.64	1.14	1.67	3.30
FeO..............	4.96	5.13	4.63	5.99	0.76
MgO	2.47	2.52	4.56	5.51	0.70
CaO	3.20	9.79	5.85	4.59	2.32
Na_2O.............	2.12	2.13	3.38	2.27	9.77
K_2O..............	3.96	0.33	5.44	1.32	2.26
H_2O+.............	2.40	0.78	0.50	2.60	} 7.00
H_2O-	0.15	0.02	0.10	0.15	
TiO_2.............	0.49	0.63	0.96	0.47	0.20
P_2O_5.............	0.02	0.73	0.46	0.36	
MnO	nil	0.38	0.10	0.12	0.08
CO_2	3.00	0.13		2.83	0.80
S	1.18[1]	0.42		0.10	
SO_3..............	nil				
C	0.76				
SrO			0.15		
BaO..............			0.21		
As	nil				
Total	99.91	99.57	100.12	99.62	100.09
Less O≡S	0.44	0.15		0.04	
	99.47	99.42		99.58	
Sp. gr.			2.745		2.388

NORMS

	269	270	271	272	273
QTZ	17.50	16.86	–	14.67	–
CO	2.98	–	–	5.56	–
OR	25.08	2.01	31.93	8.32	13.75
AB	20.36	19.73	26.18	21.71	54.20
AN...............	16.87	40.52	17.95	21.79	.93
LC	–	–	–	–	–
NE	–	–	2.33	–	21.56
KP	–	–	–	–	–
AP...............	.04	1.57	.95	.80	–
RU	–	–	–	–	–
IL	.72	.90	1.32	.69	.28
PY...............	3.29	1.31	–	.27	–
HE	–	–	–	–	1.30
MT	1.42	2.84	1.17	1.85	1.57
EN	7.35	7.23	–	16.33	–
FS	4.32	5.24	–	7.94	–
OL	–	–	10.39	–	–
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	7.72	–	4.00
WO	–	1.90	–	–	2.36
GR[2]	0.76				

[1]Contains 0.05% S in pyrrhotite.
[2]GR=graphite.

265. **AUGITE OLIVINE LATITE.** Interbedded with the biotite augite latite in the Rossland Volcanic Group, Record Mountain Ridge, Rossland Mountains, B.C.

82–F–W½ (Anal. M.F. Connor) Ser. No. *1912–51*

Deep greenish grey to black rock with phenocrysts of somewhat uralitized augite, partly serpentinized olivine, very fresh labradorite, and a small amount of biotite. Part of the phase is hyalopilitic, bearing microlites of labradorite, magnetite, apatite, and possibly orthoclase, but most of the groundmass is a glass, which is turbid through the very abundant generation of sericitic mica and other secondary products.

R.A. Daly (1912, p. 328) *See also* Nos. 263, 271 *(1912-50, 49)*

266. **TUFF.** One thousand foot level, near mine station 1010, Canadian Associated Goldfields mine, on claim T.C. 699, southern part of McVittie tp., Timiskaming district, Ont.

32–D–W½ (Anal. E.A. Thompson) Ser. No. *1927–17*

Thin-bedded, dark, unsheared tuff consisting largely of sericite or talc and carbonate, with some quartz, some obscure material that may be feldspar, and a little blackish material, probably carbon. A little pyrite is commonly present.

H.C. Cooke (1927, p. 24)

267. **TUFF.** One thousand foot level, near mine station 1010, Canadian Associated Goldfields mine, claim T.C. 699, southern part of McVittie tp., Timiskaming district, Ont.

32–D–W½ (Anal. E.A. Thompson) Ser. No. *1927–19*

Partly sheared black tuff from the "graphite fault" shear zone, which converts rocks over widths of several feet into fissile schist. The minerals are too obscured by graphite for identification.

H.C. Cooke (1927, p. 24)

268. Location and description same as No. 267.

32–D–W½ (Anal. E.A. Thompson) Ser. No. *1927–18*

H.C. Cooke (1927, p. 24)

269. Location and description same as No. 267.

32–D–W½ (Anal. E.A. Thompson) Ser. No. *1927–16*

H.C. Cooke (1927, p. 24)

270. **DACITE.** Flow conformable with andesites and trachytes, intruded by post-Keewatin intrusions and overlain by Cobalt sedimentary rocks, Dasserat tp., range line 6–7, 1,400 feet west of Lake Dasserat, Timiskaming co., Que.

32–D–W½ (Anal. R.J.C. Fabry) Ser. No. *1950–12*

Contains exceptionally large pillows with thickness up to 6 feet and lengths in excess of 20 feet. Pillows show selvages 3 inches thick, banding in the core concentric with the selvages. Phenocrysts are found both in the cores and in the selvages, and amygdules are found throughout and are composed of quartz, chlorite, epidote, and clinozoisite. Mafic minerals have been completely altered to chlorite.

(K.R. Dawson)

271. **LATITE.** Thick sheets alternating with more basaltic sheets and with coarse agglomerates; unnamed conical peak, west of Murphy Creek, Gladstone Trail, about 2 miles north of Stony Creek, Rossland Mountain Group, B.C.

82–F–W½ (Anal. M.F. Connor) Ser. No. *1912–49*

Deep greenish grey to almost black rock, bearing abundant phenocrysts of tabular plagioclase up to 3 mm in greatest diameters, and smaller stout prisms of greenish black pyroxene. Uncrushed phenocrysts are unstrained and almost completely unaltered. The plagioclase has an average composition of labradorite, and is in places surrounded with a narrow rim of orthoclase. The pyroxene is common, pale greenish augite of diopsidic habit. The groundmass is somewhat altered, with the generation of uralite in small needles, zoisite in rather rare granules, chlorite, abundant biotite, and more sericitic mica in minute foils and shreds.

R.A. Daly (1912, p. 325)

272. **DACITE.** Lava flow lying in conformable series with dacite and trachyte, intruded by post-Keewatin intrusions and overlain by Cobalt sedimentary series, Dasserat tp., rge. 6, lot 6, 1,500 feet north of range line 5–6 on the shore of Labyrinth Lake, Timiskaming co., Que.

32–D–W½ (Anal. R.J.C. Fabry) Ser. No. *1950–10*

Grey intermediate lava, which seldom shows phenocrysts and is characterized by pillows rarely exceeding 3 feet in length, with selvages rarely more than 1 inch thick. Vesicles, which are quite abundant, are commonly filled by white calcite. The original constituents have been altered to chlorite, sericite, epidote, and clinozoisite. Mafic minerals have been completely altered to chlorite.

(K.R. Dawson)

273. **BLAIRMORITE.** Found as a rounded waterworn fragment about 2 feet in diameter, in a 3-foot stratum of analcite breccia, in a fine-grained dull green matrix (tuffaceous) with analcite crystals, in the valley of the Southfork River, Alta.

82–G–E½ (Anal. M.F. Connor) Ser. No. *1914–31*

Consists of bright flesh red phenocrysts of analcite up to 1 inch in diameter, rare light pink phenocrysts of glassy sanidine, and occasional small melanites, in a finely crystalline groundmass of second generation analcite, aegirine-augite, nepheline, sanidine, and melanite, which in turn are embedded in an unresolvable matrix. Calcite, and perhaps chlorite are the only secondary minerals. Large analcite phenocrysts are faintly pink, homogeneous, and isotropic. Narrow rims of clear analcite border most of the phenocrysts. (M)

J.D. MacKenzie (1914, p. 23)

274. **AUGITE TRACHYTE.** Phoenix, Boundary district, B.C.

82–E–E½ (Anal. M.F. Connor) Ser. No. *1912–18*

Light brownish grey porphyritic rock containing phenocrysts of orthoclase and soda orthoclase, twinned andesine surrounded by orthoclase shell, augite, calcite, magnetite, and biotite. Laths of orthoclase and plagioclase augite, and biotite make up the base. Pyrite and apatite are also present.

O.E. Le Roy (1912, p. 46)

275. **ANDESITE.** Bonanza Formation, north shore of Ceepeecee Narrows, Vancouver Island, B.C.

92–E–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–4*

Grey, fine-grained andesite.

J.W. Hoadley (1953, p. 25)

276. **ANALCITIC RHOMB PORPHYRY ('SHACKANITE').** Lava, extrusive phase of the rhomb-porphyry forming a great mass capping the ridge, just north of the summit of the mountain lying immediately east of the north fork of Rock Creek and 5 miles north of the International Boundary, Midway Mountain, B.C.

82–E–W½ (Anal. M. Dittrich) Ser. No. *1912–67*

Very fresh, slate grey, porphyritic rock containing phenocrysts of rhomb feldspar (and orthoclase), augite, and of olivine and biotite in accessory amounts. The groundmass is largely composed of minute but perfectly formed analcite crystals with which are associated many anorthoclase microlites, and accessory apatite, magnetite, a few grains of pyrite, and titanite. All of these are embedded in an abundant, transparent, pale brownish glass containing a few grains of secondary carbonate. (M)

R.A. Daly (1912, p. 414)

277. **HORNBLENDE AUGITE LATITE.** Flow rock of the Rossland Volcanic group, at the 3,100-foot contour on the slope due east of Sayward railway stations, Rossland Mountains, Boundary district, B.C.

82–F–W½ (Anal. M.F. Connor) Ser. No. *1912–52*

	274	275	276	277	278
SiO_2	53.42	52.64	52.36	52.24	52.17
Al_2O_3	19.78	20.69	13.85	19.28	16.59
Fe_2O_3	0.57	2.54	5.28	4.34	1.86
FeO	8.96	1.82	9.02	1.13	3.74
MgO	2.96	1.61	5.18	1.85	3.87
CaO	1.94	3.93	4.11	4.43	8.25
Na_2O	4.44	4.84	4.20	6.34	3.91
K_2O	2.31	5.99	0.34	2.40	4.00
H_2O+	3.69	2.23	3.01	4.63	1.17
H_2O-	0.07	0.28	0.45	0.80	0.13
TiO_2	1.04	0.64	1.37	0.73	0.80
P_2O_5		0.41	0.32	0.59	0.24
MnO	0.14	0.07	0.52	trace	0.11
CO_2	trace	0.75	nil	0.35	0.56
S			0.16		
SrO		0.21		0.42	0.05
BaO		0.60		0.36	0.15
FeS_2					) 2.31
Fe_7S_8					
Total	99.32	99.25	100.17	99.89	99.91
Less O≡S			0.06		
			100.11		
Sp. gr.				2.528	2.852

NORMS

	274	275	276	277	278
QTZ	3.48	–	6.10	–	–
CO	7.31	–	–	–	–
OR	14.24	36.13	2.10	14.75	24.40
AB	41.49	24.74	39.49	49.17	25.42
AN	10.03	17.31	18.78	17.68	16.35
LC	–	–	–	–	–
NE	–	11.17	–	5.94	6.44
KP	–	–	–	–	–
AP	–	.87	.70	1.28	.51
RU	–	–	–	–	–
IL	1.50	.90	1.99	1.05	1.14
PY	–	–	.43	–	2.31*
HE	–	–	–	2.37	–
MT	.61	2.70	5.77	1.13	1.99
EN	8.57	–	15.10	–	–
FS	12.73	–	9.32	–	–
OL	–	2.44	–	2.45	3.47
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	3.16	–	4.14	20.23
WO	–	–	.16	–	–

*Reported as (pyrite + pyrrhotite).

Fine-grained, dark grey rock with conspicuous, lustrous, black prisms of phenocrystic hornblende and a subordinate number of idiomorphic augite prisms in a rather confused, microcrystalline aggregate of hornblende, augite, and feldspar. Orthoclase forms a large proportion of the groundmass feldspar microlites, the rest are probably labradorite. Magnetite, pyrite, pyrrhotite, and a little titanite are accessory. Calcite, chlorite, epidote, kaolin, and sericite are secondary.

R.A. Daly (1912, p. 329)

278. **CHERTY TUFF.** Sansum Narrows, Vancouver Island, B.C.

92–B–W½ (Anal. N.L. Turner) Ser. No. *1917–11*

Light coloured rock, fine-grained, though seldom equigranular, thinly and uniformly bedded and soft. The composition of the different beds varies considerably. Most of them contain $CaCO_3$ in varying amounts. The least altered parts are made up of small fragments of oligoclase albite, a few fragments of quartz, and accessory pyrite, ilmenite, and leucoxene. These fragments are embedded in a very fine-grained groundmass, consisting of feldspar with some quartz, and a large proportion of sericite and some chlorite.

C.H. Clapp (1917, p. 141)

279. **ANDESITE.** Associated with coarser grained dioritic types with which it is presumably genetically related; at a depth of 608 feet in diamond drill hole No. 3, Ural claim, B.R.X. property, Bridge River mining camp, B.C.

92–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1934–1*

A fine-grained, massive, green, very fresh rock, mostly composed of a slightly pleochroic, ragged amphibole and plagioclase. Accessory and secondary minerals include considerable zoisite, pyrite, titanite, and magnetite. No quartz was identified.

C.E. Cairnes (1937, p. 23) *See also* No. 180 *(1935–24)*

280. **ANDESITE.** Bonanza Group, 1 mile northeast of Ceepeecee, Vancouver Island, B.C.

92–E–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–2*

Dark purple porphyritic andesite.

J.W. Hoadley (1953, p. 25)

281. **AUGITE PORPHYRITE TUFF.** Occurs in considerable thickness to the east of Carabine Creek, Nicola map-area, Kamloops and Yale districts, B.C.

92–I–E½ (Anal. R.J.C. Fabry) Ser. No. *1948–8*

	279	280	281	282	283
SiO_2	52.15	51.83	50.97	49.68	49.60
Al_2O_3	15.05	19.77	14.97	15.35	14.84
Fe_2O_3	2.30	5.08	3.06	4.53	4.14
FeO	6.35	4.20	1.31	9.22	3.45
MgO	8.31	2.33	9.08	4.40	7.58
CaO	10.14	6.98	7.10	6.92	7.72
Na_2O	2.48	5.28	0.99	3.84	2.68
K_2O	0.07	0.27	5.95	2.25	3.72
H_2O+	0.77	2.98	2.09	2.14	) 3.30
H_2O-	0.10	0.14	0.59	0.29	
TiO_2	0.88	0.42	0.53	1.37	1.10
P_2O_5	0.22	0.43	0.39		
MnO	0.10	0.01	0.05		0.10
CO_2	nil	nil	2.54	0.65	1.80
S	0.61	0.20	0.12		
Cr_2O_3	0.12				
NiO	nil				
Total	99.65	99.92	99.77 (99.74)	100.64	100.03
Less O=S	0.23	0.07	0.05		
	99.42	99.85	99.72 (99.69)		

NORMS

	279	280	281	282	283
QTZ	4.49	2.21	–	–	–
CO	–	–	–	–	–
OR	.41	1.64	36.62	13.78	22.93
AB	22.37	48.66	9.23	35.50	23.91
AN	29.87	30.22	19.52	18.61	18.16
LC	–	–	–	–	–
NE	–	–	–	.10	.68
KP	–	–	–	–	–
AP	.46	.92	.84	–	–
RU	–	–	–	–	–
IL	1.23	.60	.76	1.97	1.59
PY	1.59	.53	.32	–	–
HE	–	–	1.00	–	–
MT	2.53	5.44	1.80	4.89	4.49
EN	23.24	6.65	11.62	–	–
FS	6.03	2.09	–	–	–
OL	–	–	6.63	11.54	10.78
AC	–	–	–	–	–
NSI	–	–	–	–	–
KSI	–	–	–	–	–
DI	–	–	11.59	13.58	17.42
WO	7.73	.99		–	–

Fine-grained, purplish red, partly serpentinized rock showing good bedding and crossbedding and composed of minute fragments composed of phenocrysts of pigeonite still embedded in their original matrix.

W.E. Cockfield (1948, p. 25)

282. **DIORITE.** Abitibi volcanics, northeast bay of Lake Dufresnoy, Dufresnoy tp., Abitibi co., Que.

32–D–E½ (Anal. S.J. Lloyd) Ser. No. *1914–2*

Dark green rock, composed essentially of plagioclase and amphibole, which may be actinolite, tremolite, or pale green hornblende. Ilmenite is commonly present. The feldspars are largely replaced by carbonate, zoisite, epidote, and sericite. The original pyroxene has disappeared entirely or remains as a residual core in the midst of secondary hornblende.

M.E. Wilson (1913, p. 48)

283. **BASALT.** Transitions between the trachytes, west flank of Franklin Mountain, Franklin mining district, B.C.

82–E–E½ (Anal. Mines Branch) Ser. No. *1915–16*

Vesicular, amygdaloidal, alkalic rock composed dominantly of a pale green augite in a felsophyric groundmass consisting of alkalic feldspar with much disseminated magnetite dust. The amygdules are generally oval shaped, and filled with intergrown chalcedony and calcite surrounded by a shell of epidote.

C.W. Drysdale (1915a, p. 128)

284. **ANDESITE.** Lies in conformable series with dacite and trachyte, intruded by post-Keewatin intrusions and overlain by Cobalt sedimentary series; rge. 10, lot 10, 900 feet south of the north tp. line, Dasserat Lake, Timiskaming co., Que.

32–D–W½ (Anal. R.J.C. Fabry) Ser. No. *1950–13*

Intermediate green lava, which seldom shows phenocrysts and is characterized by pillows rarely exceeding 3 feet in length, with selvages rarely more than 1 inch in thickness. Vesicles, which are abundant, are commonly filled by white calcite. The original constituents have been altered to chlorite, sericite, epidote, and clinozoisite. The mafic minerals have been completely altered to chlorite.

(K.R. Dawson)

285. **ANDESITE.** Bonanza Group, ½ mile southeast of Ceepeecee, Vancouver Island, B.C.

92–E–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–3*

	284	285	286	287	288
SiO_2	49.59	49.29	48.96	46.68	41.50
Al_2O_3	22.40	19.34	18.38	17.15	17.09
Fe_2O_3	0.62	3.22	3.02	2.19	3.31
FeO	7.04	7.66	7.48	8.33	10.08
MgO	4.37	4.45	5.17	7.92	12.74
CaO	7.80	8.10	7.55	13.55	9.97[1]
Na_2O	3.22	3.09	3.01	1.42	2.84
K_2O	0.25	0.98	1.21	0.90	0.22
H_2O+	3.57	3.42	3.23	1.16	6.99
H_2O-	0.04	0.14	0.23	0.07	0.21
TiO_2	0.63	0.68	0.84	0.53	3.33
P_2O_5	0.27	0.32	0.10	0.40	1.08
MnO	0.16	trace	nil	0.13	trace
CO_2	0.11	nil	nil	nil	nil
S	0.34	0.10	0.19	nil	
Total	100.21	100.79	99.37	100.43	100.36
Less O≡S	0.12	0.04	0.07		
	100.09	100.75	99.30		
Sp.gr.					2.792

NORMS

	284	285	286	287
QTZ	2.27	.34	–	–
CO	3.60	–	–	–
OR	1.51	5.99	7.47	5.38
AB	29.62	28.64	28.18	12.89
AN	38.04	37.16	34.47	38.18
LC	–	–	–	–
NE	–	–	–	–
KP	–	–	–	–
AP	.53	.69	.21	.84
RU	–	–	–	–
IL	.89	.97	1.21	.74
PY	.90	.26	.51	–
HE	–	–	–	–
MT	.66	3.40	3.28	2.31
EN	12.46	12.78	13.29	2.84
FS	9.46	8.75	7.36	1.39
OL	–	–	.79	13.56
AC	–	–	–	–
NSI	–	–	–	–
KSI	–	–	–	–
DI	–	–	3.17	21.81
WO	–	.89	–	–

[1] Second determination gave 0.89%, third gave 1.01% with MgO=12.57%

Light green, porphyritic amygdaloidal andesite consisting of euhedral saussuritized phenocrysts of plagioclase (An_{32}) in fine-grained groundmass of plagioclase microlites, chlorite, and epidote.

J.W. Hoadley (1953, p. 25)

286. **ANDESITE.** Bonanza Group, 1 mile northeast of Ceepeecee, Vancouver Island, B.C.

92–E–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–1*

Medium-grained, dark grey-green porphyritic andesite.

J.W. Hoadley (1953, p. 25)

287. **BASALT.** Lava flows, which lie in a conformable sequence facing south and having pyroclastic partings between them. Dassarat tp., rge. 6, lot 6, 1,300 feet south of range line 6–7, on the property of Monarch mine, Timiskaming co., Que.

32–D–W½ (Anal. R.J.C. Fabry) Ser. No. *1950–11*

Fine-grained, amygdaloidal black lava, with pillows commonly 2 feet long with 1 inch selvages and no concentric banding. Consists of well defined plagioclase laths, which have a tendency to radiate from common centres in a groundmass composed of finely disseminated chlorite and minor amounts of granular epidote. Resembles fine-grained, intrusive diabase.

(K.R. Dawson)

288. **BASALT.** Purcell lava; high eastern ridge of the McGillivray range at a point about 1 mile south of the International Boundary, east of the main fork of the Yahk River, U.S.A.

82–G–W½ (Anal. M. Dittrich) Ser. No. *1912–35*

Massive, eminently porphyritic, non-vesicular phase, 200 feet thick, which passes above into a highly amygdaloidal lava and below into a compact, slightly vesicular basalt. Abundant, large feldspar phenocrysts have a dull lustre and brownish or greenish colour owing to the advanced alteration. They have albite twinning, are near labradorite in composition and are filled with swarms of minute, secondary foils of sericitic habit but indeterminable (hydrargillite?). The base shows thorough decomposition, and the formation of much chlorite, leucoxene, and the same colourless to pale greenish micaceous mineral found in the altered phenocrysts. Numerous microlites of labradorite also occur.

R.A. Daly (1912, p. 209)

289. **PICRITE.** Tertiary flow. Watching Creek, Nicola map-area, Kamloops and Yale districts, B.C.

92–I–E½ (Anal. R.J.C. Fabry) Ser. No. *1948–7*

Dark green to nearly black rock mottled with light green, or red and green. Markedly porphyritic, with reddish altered olivine phenocrysts and smaller phenocrysts of pyroxene occurring in a groundmass of small pyroxene prisms and glass. The olivine crystals have been transformed into mesh antigorite, partly replaced by secondary colloidal serpentine, with iron sesquioxide also visible. Part of the groundmass is also serpentinized.

W.E. Cockfield (1948, p. 27)

	289
SiO_2	39.71
Al_2O_3	5.14
Fe_2O_3	6.88
FeO	0.38
MgO	31.48
CaO	4.63
Na_2O	
K_2O	0.39
H_2O+	8.91
H_2O-	1.26
TiO_2	0.16
P_2O_5	0.09
MnO	0.40
CO_2	
S	0.27
Cr_2O_3	0.39
NiO	0.11
Total	100.50 (100.20)
Less O≡ S	0.10
	100.40 (100.10)

Extrusive Rocks, Partial Analyses

290. FELSITE. Associated with amphibolites; shore of Burnt Lake, Lake tp., con. 6, lot 17, Hastings co., Ont.

31–C–W½ (Anal.?) Ser. No. *1910–41*

Pinkish, cryptocrystalline, splintery, indistinctly foliated rock with occasional narrow streaks darker in colour running through it. Rare phenocrysts of microperthite have been broken down by movements in

the rock, which gives them the appearance of fading away into the quartz feldspar mosaic forming the groundmass. Minute individuals of iron ore, varying amounts of muscovite, and small amounts of biotite also occur. The quartz, in slightly coarser grained aggregates occurring here and there, shows undulatory extinction.
SiO_2 71.28%, Na_2O 5.42%, K_2O 5.32%.

F.D. Adams and A.E. Barlow (1910, p. 336)

291. **FELSITE.** Associated with amphibolites and, along its southwestern extremity, with conglomerates; a rocky ridge, Lake tp., con. 5, lot 19, Hastings co., Ont.

31–C–W½ (Anal. ?) Ser. No. *1910–42*

Description same as No. 290
SiO_2 63.94%, Na_2O 6.36%, K_2O 5.24%.

F.D. Adams and A.E. Barlow (1910, p. 336)

292. **RHYOLITE.** Tertiary lava flow, Franklin Mountain, Franklin mining district, B.C.

82–E–E½ (Anal. Mines Branch) Ser. No. *1915–14*

Varies from holocrystalline to porphyritic types to semicrystalline types having flow and vesicular structure.

SiO_2 69.60%, CaO 0.68%, Na_2O 3.97%, K_2O 5.84%.

C.W. Drysdale (1915a, p. 124)

293. **TRACHYTE.** Near McGill College, Montreal, Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1856–35*

Compact or finely granular rock divided by joints into irregular fragments. Joint surfaces are often coated with thin bladed crystals of a zeolitic mineral. Small brilliant crystals of cubic iron pyrites, often highly modified, are disseminated throughout the mass.
Sp. gr. 2.617–2.632.
a) The part of the rock insoluble in acetic and nitric acid was treated in a solution of carbonate of soda to remove a portion of the silica, then analyzed.
SiO_2 63.25%, Al_2O_3 22.12%, CaO 0.56%, Na_2O 6.29%, K_2O 5.92%, volatile 0.93%, total 99.07%.
b) Part of the rock insoluble in acetic acid and nitric acid was analyzed.
SiO_2 62.90%, Al_2O_3 23.10%, CaO 0.45%, Na_2O 8.69%, K_2O 2.43%, volatile 1.40%, total 98.97%.

T.S. Hunt (1857c, p. 488)

294. **TRACHYTE.** In the limestone quarries at Mile End, near Montreal, Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1858–24*

Greyish white, granular rock with dark grey spots and carrying a few crystals of hornblende. The part of the rock insoluble in nitric acid was analyzed.

SiO_2 61.62%, Al_2O_3 21.00%, CaO 2.69%, potash 4.66%, soda 5.35%, volatile 2.37%, total 97.69%.

T.S. Hunt (1859, p. 174)

295. **TRACHYTE.** Lachine, Montreal Island, Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1856–34*

White, somewhat earthy in its aspect. That part of the rock insoluble in nitric acid was analyzed.

SiO_2 58.50%, Al_2O_3 24.90%, CaO 0.45%, potash undetermined, soda undetermined, volatile 2.10%.

T.S. Hunt (1857c, p. 490)

296. **VOLCANIC.** Probably a sill occurring in black slates, and structurally overlying the Cassiar Asbestos Corporation serpentinite body, Cassiar, B.C.

104–P–W½ (Anal. J.A. Maxwell) Ser. No. *1955–5*

Typical aphanitic green volcanic rock consisting of fine-grained crystalloblastic aggregate of tremolite, zoisite, and albite. Contains minor ilmenite, sphene, leucoxene, quartz, and calcite.

FeO 9.27%, MgO 6.83%, CaO 8.08%, Na_2O 3.07%, K_2O 0.19%.

(H. Gabrielse) *See also* Nos. 435, 436, 437, 1063, 1069 *(1954–39, 22, 20, 40; 1955–1)*

297. **CHERTY TUFF.** William Head, Vancouver Island, B.C.

92–B–W½ (Anal. Brinton) Ser. No. *1917–16*

Very dense and cherty-like, water-deposited rocks, containing large amounts of volcanic detritus. Forms thin, but fairly persistent beds of hard, dense, usually banded or laminated rocks, which are red, green, or nearly black on weathered surfaces, and greyish green on fresh fractures. Fairly homogeneous, but certain layers are of slightly finer or coarser grain than others. Composed of small angular fragments of feldspar, chiefly albite oligoclase, some small laths of andesine labradorite, and augite and quartz embedded in a very fine grained matrix composed largely of feldspar, mixed with quartzose and possibly argillaceous matter and partly replaced by carbonates. Epidote, chlorite, sericite, and limonite in small amounts, may be largely secondary. (M)

SiO_2 68.75%, Al_2O_3 12.25%, Na_2O 5.16%, K_2O 0.09%.

C.H. Clapp (1917, p. 268)

298. **TUFF.** Intercalated in many places with grits and rhyolite flows; Kettle River Formation, McKinley Mountain, B.C.

82–E–E½ (Anal. Mines Branch) Ser. No. *1915–9*

Evenly bedded, fine-granular to dense, water laid, light grey rock with a decidedly clayey odour when breathed upon. Composed of a fine-grained aggregate of angular quartz grains and fragments of feldspar with isotropic glass and a few small zircon grains. Kaolin and chlorite are present as alteration products.

SiO_2 51.72%, CaO 5.32%, Na_2O 4.22%, K_2O 0.89%.

C.W. Drysdale (1915a, p. 97)

ANALYSES OF METAMORPHIC ROCKS

299. **ARGILLITE.** Specimen taken 6 feet from the nearest radioactive vein, east of Melville Lake, ¼ mile north of Beaverlodge Lake, Martin Lake map-area, Sask.

74–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–11*

Fine-grained, thinly bedded, fresh, black argillite. Cut by thin, red feldspar veinlets in bed dipping gently 20°NW. The bedding occurs as delicate laminations broken by a minor quantity of detrital quartz grains, and is preserved by variations in grain size and in the relative proportions of chlorite and sericite, which are the major constituents. The thin section consists largely of a dense, unresolved mass of chlorite and sericite with minor feldspar and quartz.

K.R. Dawson (1951, p. 19) *See also* Nos. 304, 391, 394, 396, 400 *(1951–14, 16, 15, 17, 12)*

300. **SLATE.** Danville Slate Quarry, Danville, Richmond co., Que.

31–H–E½ (Anal. B.J. Harrington) Ser. No. *1895–50*

F.D. Adams (1896b, p. 60) *See also* No. 306 *(1895–50)*

301. **SLATE.** Upper Silurian, Westbury, Richmond co., Que.

21–E–W½ (Anal. T.S. Hunt) Ser. No. *1854–16*

Greenish blue rock with silky lustre on the cleavage surfaces and translucent on the edges.

T.S. Hunt (1857b, p. 384)

302. **SLATE.** New Rockland Company Mine, situated on a rise about 500 feet above the St. Francis River, 4 miles to the north, Melbourne tp., Richmond co., Que.

31–H–E½ (Anal. B.J. Harrington) Ser. No. *1888–19*

The slate cleaves readily and is free from pyrite.

R.W. Ells (1890, p. 130)

303. **ARGILLITE.** Palaeozoic, in contact with a bed of serpentine, in Walton's quarries, Melbourne tp., Richmond co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1863–4*

Fine-grained roofing slate.

Geological Survey (1863, p. 600)

304. **ARGILLITE.** Taken 10 feet from the nearest radioactive vein, ½ mile north of Beaverlodge Lake, Martin Lake map-area, Sask.

74–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–14*

Fresh, black, fine-grained argillite with bedding characteristically as fine laminations. Dips 20°NW. Consists of extremely fine-grained aggregate of chlorite and sericite with minor quantity of detrital quartz. Bedding lamellae are preserved by grain gradation and by the relative concentrations of chlorite and sericite.

K.R. Dawson (1951, p. 48) *See also* Nos. 299, 391, 394, 396, 400 *(1951–11, 16, 15, 17, 12)*

	299	300	301	302	303
SiO_2	68.39	67.85	65.85	65.39	64.20
Al_2O_3	13.20	9.10	16.65	15.97	16.80
Fe_2O_3	1.86				
FeO	4.26	11.14	5.31	4.66	4.23
MgO	2.17	3.23	2.95	2.99	3.94
CaO	0.93	0.98	0.59	0.67	0.73
Na_2O	2.08	1.80	1.31	3.33	3.07
K_2O	2.10	0.44	3.74	3.60	3.26
H_2O+	3.03		3.10		
H_2O-	0.08				
TiO_2	0.53				
P_2O_5	0.12				
MnO	0.04	0.79		0.39	
CO_2	nil				
S	0.12				
C	0.23				
Loss on ignition		4.55		3.26	3.40
Total	99.14	99.88	99.50	100.26	99.63
Less O≡S	0.04				
	99.10				
Sp. gr.	2.729		2.771	2.75	

305. **ARGILLITE.** Giauque Lake, District of Mackenzie.

85–O–E½ (Anal. R.J.C. Fabry) Ser. No. *1950–4*

Fine grained, massive to schistose, greyish black to black on fresh and weathered surface. Occurs mostly in wide belts in beds averaging ½-inch thick grading from a grey, sandy base to a prominent, black, dense argillaceous top. It consists of large, ragged, uniformly distributed flakes of brown biotite and chlorite and a fine-grained matrix of quartz, feldspar, and tiny flakes of sericite and chloritic material.

L.P. Tremblay (1952, p. 17)

306. **SLATE.** Danville Slate Quarry, Danville, Richmond co., Que.

31–H–E½ (Anal. H.J. Harrington) Ser. No. *1895–50*

F.D. Adams (1896b, p. 60) *See also* No. 300 *(1895–50)*

	304	305	306	307	308
SiO_2	61.84	56.97	55.75	54.80	53.08
Al_2O_3	17.42	19.81	17.87	23.15	20.16
Fe_2O_3	0.07	0.20			1.25
FeO	6.12	8.64	9.07	9.58	7.17
MgO	3.35	3.41	5.81	2.16	5.02
CaO	1.82	4.19	1.14	1.06	1.04
Na_2O	5.32	1.53	1.12	2.22	1.83
K_2O	0.90	2.37	2.97	3.37	3.75
H_2O+	2.41	1.00			4.55
H_2O-	0.30	0.08		3.90	0.15
TiO_2	0.52	0.31			0.79
P_2O_5	0.20				0.15
MnO	0.03		0.70		0.11
CO_2	nil				0.05
S	0.04				0.11
Cl					0.01
C	0.24	1.00			0.26
Cr_2O_3					0.03
Loss on ignition			5.26		
Total	100.28 (100.58)	99.51	99.69	100.24	99.51
Less O≡S	0.02				0.05
	100.26 (100.56)				99.46
Sp.gr.				2.88	2.777

307. **SLATE.** In a band associated with dolomite, lot 4, rge. 1, Kingsey tp., Drummond co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1852–8*

Bluish purple, smooth, even, silky slate, free from iron pyrites or other impurities. When struck, they give a ringing sound and are easily cut and pierced without showing ragged edges or splitting.

W.E. Logan (1854, p. 72)

308. **SEDIMENTS.** From Burwash shaft and Yellowknife River areas, Yellowknife, District of Mackenzie.

85–J–E½ (Anal. J.A. Maxwell) Ser. No. *1955–17*

Composite of slates, argillites, and other similar rocks from coal sediments.

R.W. Boyle (1961, p. 69)

309. **SLATE.** Shipton tp., Richmond co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1856–31*

Greenish grey, fine-grained rock; appears to be made up of minute shining scales, confusedly arranged.

T.S. Hunt (1857c, p. 448)

310. **PHYLLITE.** In beds up to 25 feet thick in the canyon of a creek flowing into Mesilinka River from the north, about 7 miles east of Blackpine Lake, Aiken Lake map-area, B.C.

94–C–W½ (Anal. R.J.C. Fabry) Ser. No. *1947–2*

Blue-grey, sericitic phyllite. Very soft and friable.

E.F. Roots (1954, p. 71)

311. **SERICITE SCHIST.** Altered quartz feldspar porphyry adjacent to quartz veins, Negus-Rycon system, Yellowknife, District of Mackenzie.

85–J–E½ (Anal. J.A. Maxwell) Ser. No. *1955–7*

Contains sericite, quartz, pyrite, arsenopyrite (?), carbonate and probably some feldspar.

R.W. Boyle (1961, p. 125)

312. **SCHIST.** Sawmill Bay, Pilot Bay Village, east side of Kootenay Lake, West Kootenay district, B.C.

82–F–E½ (Anal. R.A.A. Johnston) Ser. No. *1898–20*

A finely crystalline, bluish grey schist.

G.C. Hoffmann (1900, p. 17)

	309	310	311	312	313
SiO_2	51.50	44.45	72.46	69.50	67.94
Al_2O_3	29.20	30.15	16.26	15.05	16.75
Fe_2O_3		3.27	0.34	0.27	1.17
FeO	9.27	3.66	0.45	2.38	4.44
MgO	1.08	2.98	0.77	3.20	2.63
CaO		0.42	0.94	1.10	1.42
Na_2O	1.59	1.06	0.63	2.85	1.70
K_2O	1.54	6.12	3.94	4.75	0.75
H_2O+	) 5.10	4.93	1.93	) 0.50	2.16
H_2O-		0.79	0.12		0.12
TiO_2		0.84	0.25		0.34
P_2O_5			0.10		
MnO		trace	0.01	trace	
CO_2		nil	0.97		
S		0.12	1.27		
SO_3		0.89			
Cl			0.01		
Cr_2O_3			nil		
Total	99.28	99.68	100.45	99.60	99.42
Less O≡S		0.04	0.55		
		99.64	99.90		
Sp.gr.			2.74	2.693	

313. **NODULAR SCHIST.** Giauque Lake, District of Mackenzie.

85–O–E½ (Anal. R.J.C. Fabry) Ser. No. *1950–3*

Bedding is commonly preserved by a pronounced banding in which nodule-poor bands alternate with bands containing a high percentage of nodules. Nodules up to 2 inches in diameter commonly constitute 35% of the rock and appear as spherical to oval aggregates of biotite and quartz. Fresh surfaces are light to dark grey, of massive, granular appearance and seldom show conspicuous nodules. Weathered surfaces are grey to brownish grey and are coarsely granular with pronounced nodular structure. The nodules appear in sections as metacrysts of cordierite or more rarely as andalusite or staurolite, replete with inclusions of quartz, feldspar, and mica. Groundmass is fine to medium grained, consisting of interlocking quartz, feldspar, and brown biotite.

L.P. Tremblay (1952, p. 17)

314. **SCHIST AND PHYLLITE.** In beds about 6 feet thick, separated by bands of micaceous quartzite up to 12 inches thick, in the canyon of a creek flowing into Mesilinka River from the north, about 7 miles east of Blackpine Lake, Aiken Lake map-area, B.C.

94–C–W½ (Anal. R.J.C. Fabry) Ser. No. *1947–1*

Grey-brown to silvery, fine-grained, very flaky quartz sericite schist and phyllite.

E.F. Roots (1954, p. 71)

315. **ARGILLITE.** Formation 5, low grade metamorphic rock from south end of point separating Dummy Bay from File Lake, Morton Lake map-area, Man.

63–K–E½ (Anal. R.J.C. Fabry) Ser. No. *1947–14*

Fine-grained, dark, well-bedded argillite containing abundant fine flakes of biotite and very sparse, minute garnet crystals.

J.M. Harrison (1949b, p. 26)

316. **GREENSTONES.** A belt averaging over 6 miles wide crossing Coquihalla River in a northwesterly direction below mouth of Dewdney Creek, Cache Creek Group, Coquihalla River area, Yale district, B.C.

92–H–W½ (Anal. M.F. Connor) Ser. No. *1924–3*

Fine-grained augite andesites varying considerably in texture and composition. Dark green to grey-green and possessing a dull decomposed appearance. Partly porphyritic with feldspar and pyroxene phenocrysts. Plagioclase (oligoclase or albite oligoclase) is the chief constituent and occurs as small, idiomorphic, lath-shaped individuals and some crystal forms. Augite is the important dark mineral, frequently uralitized to amphibole. Hornblende may be primary or secondary. Apatite, magnetite, ilmenite, pyrrhotite, and some orthoclase are accessory. Secondary constituents are abundant and include uralite, hornblende, serpentine, chlorite, zoisite, epidote, calcite, talc, and hematite.

C.E. Cairnes (1924, p. 34)

317. **TALC SCHIST.** Lot 20, rge. 5, Potton tp., Brome co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1856–33*

Silvery white, flaky rock.

T.S. Hunt (1857c, p. 447)

318. **GREENSTONE.** Island in Lake Huron, 1½ miles east of Thessalon, Thessalon tp., Algoma district, Ont.

41–J–W½ (Anal. M.F. Connor) Ser. No. *1925–5*

Medium-grained, massive, basaltic rock, almost black, rather poor in vesicular, tuffaceous, and other structures indicative of its eruptive nature. Formation is non-schistose and is cut by a number of dykes of quartz diabase. More than half consists of partly decomposed hornblende, the remainder is made up of intermediate, unstriated plagioclase, brown biotite, and black iron ore altering to leucoxene. The hornblende prisms are idiomorphic toward the plagioclase.

W.H. Collins (1925, p. 75)

	314	315	316	317	318
SiO_2	59.46	58.55	53.42	51.50	49.24
Al_2O_3	14.15	18.95	14.12	3.50	10.35
Fe_2O_3	4.44	0.51	0.15		2.07
FeO	3.58	5.16	7.26	7.38	12.18
MgO	3.54	2.70	7.12	22.36	8.55
CaO	0.66	2.70	8.08	11.25	8.52
Na_2O	1.88	1.85	4.47		2.38
K_2O	2.24	4.07	0.63		1.39
H_2O+	2.37	1.37	2.53		3.20
H_2O-	0.38	0.23	0.42		0.08
TiO_2	0.68	0.53	0.70		1.60
P_2O_5		0.17	0.03		
MnO	0.02		0.13		0.09
CO_2	6.79	0.60	0.39		
S	0.29				
SO_3	0.26		trace		
C		2.58			
Cr_2O_3			0.02		
NiO			0.03	trace	
FeS_2			0.36		
volatile				3.60	
Total	100.74	99.97	99.86	99.59	99.65
Less O≡S	0.11				
	100.63				

319. **CHLORITE SCHIST.** Lat. 64°09'10", long. 111°20'55". Courageous Lakes, District of Mackenzie.

76–E–W½ (Anal. J.A. Maxwell) Ser. No. *1954–21*

Greyish green, foliated chlorite schist, dark green on weathered surface and consisting of 40% quartz and feldspar, 50% chlorite, 10% carbonate, and a trace of magnetite.

J.C.G. Moore (1956, p. 8)

320. **SCHIST.** St. Nicholas, Lévis co., Que.

21–L–W½ (Anal. T.S. Hunt) Ser. No. *1851–7*

Very soft, dark, ash-grey, earthy slate, which passes in a little distance into the agalmatolite of the area.

T.S. Hunt (1852b, p. 95)

321. **SCHIST.** Representing the contact metamorphism upon the greenstones from which they are derived and into which they pass insensibly away from irruptive contacts. From near a granite dyke belt between Rice Bay and Hopkins Bay, Rainy Lake area, Rainy River district, Ont.

52–C–W½ (Anal. M.F. Connor) Ser. No. *1913–48*

Black, glistening hornblende schist with even cleavage along transverse joints and a glistening lustre on cleavage faces. Composed of green hornblende, feldspar, and quartz, with usually a little magnetite. Hornblende forms rather stout prisms, disposed in parallel orientation. Feldspar and quartz usually form a mosaic, which may show elongation of the constituent anhedra. It is noteworthy for the almost complete absence of chlorite.

A.C. Lawson (1913, p. 50)

322. **SCHISTOSE GREENSTONE.** First island inside entrance to Rocky Island Bay, Rainy Lake, Rainy River district, Ont.

52–C–W½ (Anal. M.F. Connor) Ser. No. *1913–49*

Fine-textured, schistose, ellipsoidal greenstone with well-marked ellipsoidal structure and less commonly amygdaloidal structure.

A.C. Lawson (1913, p. 50)

	319	320	321	322	323
SiO_2	48.63	48.10	47.50	46.28	43.55
Al_2O_3	12.56	28.70	17.03	14.24	9.63
Fe_2O_3	1.22		4.15	3.93	0.75
FeO	10.91	4.80	6.67	11.62	9.93
MgO	5.04	1.41	6.70	7.40	22.67
CaO	7.46	2.10	14.90	11.28	3.40
Na_2O	2.29	1.53	0.76	2.48	trace
K_2O	0.02	4.49	0.76	0.81	trace
H_2O+	4.19	) 8.40	0.88	0.05	6.75
H_2O-	0.16		0.12	0.28	0.25
TiO_2	1.64		0.58	1.70	trace
P_2O_5	0.19		0.07	0.15	nil
MnO	0.21		0.15	0.02	nil
CO_2	5.60				3.00
S			0.04	0.06	0.05
SO_3					nil
Cl			0.09	0.08	
C					0.05
SrO			0.02	trace	
BaO			trace	trace	
Cr_2O_3			0.04	0.01	
As					nil
Total	100.12	99.53	100.46	100.39	100.03
Less O≡ S, Cl			0.04	0.04	0.02
			100.42	100.35	100.01

323. **GREENSTONE.** 1,000 foot level, near mine station 1016 of the Canadian Associated Goldfields Mine, where a branch of the "Graphite fault" cuts greenstones; claim T.C. 699, southern part of McVittie tp., Timiskaming district, Ont.

32–D–W½ (Anal. E.A. Thompson) Ser. No. *1927–23*

Sheared greenstone containing more or less white vein-like material in the interlamellar spaces.

H.C. Cooke (1927, p. 24) *See also* Nos. 260, 266–269, 323, 325, 411, 421 *(1927–16 to 24)*

324. **CHLORITE SCHIST.** From the Agnes Branch of the south fork of Sable Creek, 20 feet east of the edge of the "Coon dyke" carbonated zone, Lardeau map-area, B.C.

82–F–W½ (Anal. R.J.C. Fabry) Ser. No. *1928–8*

Uncarbonated greenstone, greatly chloritized and somewhat schistose, containing a large percentage of chlorite in shreds and irregular flakes and a smaller amount of greenish brown biotite. Quartz and feldspar, the latter in excess, constitute an exceedingly fine-grained groundmass. Numerous tiny grains of magnetite or ilmenite and several well-formed prisms of apatite are present. Quartz forms in tiny veinlets in some of which are small amounts of vermicular chlorite. Rock is exceedingly fine grained.

H.C. Gunning (1929b, p. 116–124)

325. **GREENSTONE.** 1,000-foot level near mine station 1016 of the Canadian Associated Goldfields Mine, where a branch of the "Graphite fault" cuts greenstones; claim T.C. 699, southern part of McVittie tp., Timiskaming district, Ont.

32–D–W½ (Anal. E.A. Thompson) Ser. No. *1927–22*

Unsheared, altered Keewatin lava composed entirely of secondary minerals except for some remnants of the original feldspar. Carbonates form 25 to 50% of the rock, and talc most of the remainder. From 5–10% of chlorite, 2–3% of quartz, and 1–2% of leucoxene, are the principal remaining constituents.

H.C. Cooke (1927, p. 24) *See also* Nos. 260, 266–269, 323, 325, 411, 421 *(1927–16 to 24)*

326. **CHLORITE SCHIST.** From the Agnes Branch of the south fork of Sable Creek, from the centre of the "Coon dyke", where the carbonization is complete, Lardeau map-area, B.C.

82–F–W½ (Anal. R.J.C. Fabry) Ser. No. *1928–9*

Rusty-weathering, grey, carbonate rock, generally coarse grained and containing many flakes of green chromium mica. The dyke follows the general strike of the surrounding rocks. Grains of grey carbonates with many flakes of mica, numerous veinlets of quartz and some of pure calcite and pyrite are sparingly disseminated throughout. It consists of coarse grains of carbonates and 20% or less of very fine-grained quartz, some of which has been introduced during alterations. Distinctly replacing the carbonates are numerous small vein-like areas of colourless to faint apple-green mica. Scattered throughout are numerous crystals of pyrite and many small areas of rusty kaolinitic (?) material.

H.C. Gunning (1929b, p. 116–124)

327. **GRANITIZED AMPHIBOLITE.** Near Ryan Lake, Crestaurum Mine area, Yellowknife, District of Mackenzie.

85–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1954–14*

R.W. Boyle (1961, p. 72)

	324	325	326	327	328
SiO_2	39.10	35.85	28.56	52.87	51.60
Al_2O_3	18.22	6.58	5.08	13.02	15.00
Fe_2O_3	2.12	0.84	0.96	8.54	1.85
FeO	10.48	9.34	8.81	1.30	8.48
MgO	12.60	23.43	22.86	9.35	7.15
CaO	4.15	6.90	2.72	8.65	7.63
Na_2O	2.92	trace	0.34	1.80	3.09
K_2O	0.18	trace	0.59	1.12	0.70
H_2O+	4.60	5.82	0.32	1.89	) 1.95
H_2O-	0.15	0.11	0.01	0.03	
TiO_2	0.41	trace	0.60	0.74	2.00
P_2O_5	0.33	nil	0.07	0.20	0.18
MnO	0.14	nil	0.13	0.19	0.24
CO_2	4.76	11.10	28.56	0.35	
S	nil	0.11	0.33	0.20	
SO_3		nil			
Cl	trace		0.01		
C		0.04			
BaO	nil				
Cr_2O_3	nil		0.14		
NiO	trace		0.06		
As		nil			
Total	100.16	100.12	100.15	100.25	99.87
Less O≡S			0.12	0.07	
			100.03	100.18	
Sp. gr.				2.80	2.95

328. **AMPHIBOLITE.** Pre-batholithic volcanic rock from the Iron Mask Mine claim, south slope of Mill Hill, Esquimalt district, southern Vancouver Island, B.C.

92–B–W½ (Anal. M.F. Connor) Ser. No. *1913–36*

Dark, finely crystalline and usually foliated rock, cut by quartz veinlets frequently parallel to and accentuating the foliation. Larger feldspars are visible, which apparently are original phenocrysts. It consists essentially of pale-green hornblende and recrystallized feldspar (oligoclase) with a pronounced foliated structure. Quartz and magnetite-ilmenite are accessory, and epidote, chlorite, and sericite are secondary, but are not present in large amount. In those varieties where contact metamorphism has been most severe, quartz and acid plagioclase occur in larger amounts replacing the older minerals. (M)

C.H. Clapp (1913, p. 34)

329. **AMPHIBOLITE.** Collected from a series of exposures in the cutting on the line of the Irondale, Bancroft, and Ottawa Railway, at Maxwells Crossing, Glamorgan tp., Haliburton co., Ont.

31–D–E½ (Anal. M.F. Connor) Ser. No. *1910–18*

Occurs as an inclusion in the granite and represents the last stage in the progressive change from limestone to amphibolite. The individuals of the several constituents show a less marked tendency to a rounded outline than those in the less highly metamorphosed rock. In mineralogical composition it also has certain differences, the pyroxene and scapolite having disappeared and a certain amount of biotite having been developed.

F.D. Adams and A.E. Barlow (1910, p. 104) *See also* Nos. 332, 344 *(1910–17, 16)*

330. **AMPHIBOLITE.** Composite sample of the amphibolite facies, near Ryan Lake, Yellowknife, District of Mackenzie.

85–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1954–9*

R.W. Boyle (1961, p. 72)

331. **AMPHIBOLITE.** Amphibolite facies, Yellowknife greenstone belt, Yellowknife, District of Mackenzie.

85–J–E½ (Anal. J.A. Maxwell) Ser. No. *1955–25*

Contains hornblende, oligoclase, epidote, magnetite, ilmenite, pyrite, pyrrhotite.

R.W. Boyle (1961, p. 67)

332. **AMPHIBOLITE.** From a series of exposures in the cutting on the line of the Irondale, Bancroft and Ottawa Railway, at Maxwells Crossing, Glamorgan tp., Haliburton co., Ont.

31–D–E½ (Anal. M.F. Connor) Ser. No. *1910–17*

Amphibolite alternates with thin bands of the limestone. It represents a second stage in the progressive change from limestone to amphibolite. It is composed of hornblende and pyroxene more or less completely replacing each other in the alternate bands, together with a considerable amount of scapolite, plagioclase, and untwinned feldspar. The rock also contains many minute, rounded grains of sphene, but holds no iron ore, and no biotite.

F.D. Adams and A.E. Barlow (1910, p. 104) *See also* Nos. 329, 344 *(1910–18, 16)*

333. **EPIDOTE AMPHIBOLITE.** Epidote amphibolite facies, Yellowknife, District of Mackenzie.

85–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1954–10*

(R.W.Boyle)

	329	330	331	332	333
SiO_2	50.83	50.41	50.03	50.00	49.95
Al_2O_3	18.64	15.21	14.52	18.84	15.12
Fe_2O_3	2.84	0.63	1.57	2.57	1.90
FeO	5.97	11.65	11.46	5.51	9.76
MgO	4.90	7.02	6.51	4.63	5.33
CaO	7.50	9.48	8.99	10.65	11.15
Na_2O	4.22	1.64	2.36	4.46	1.98
K_2O	1.83	0.74	0.66	1.18	0.18
H_2O+	} 1.40	2.56	1.70		2.03
H_2O-		0.05	0.14	1.00	0.05
TiO_2	1.10	0.79	1.12	0.82	0.94
P_2O_5		0.09	0.13		0.30
MnO	0.10	0.23	0.21	0.08	0.21
CO_2	0.11	0.02	0.09	0.10	0.45
S	0.01	0.08	0.11	0.03	0.18
Cl	0.03		0.03	0.10	
C			0.04		
Cr_2O_3			0.02		
Total	99.48	100.60	99.69	99.97	99.53
Less O≡S, Cl	0.01	0.03	0.05		0.07
	99.47	100.57	99.64		99.46
Sp.gr.			2.97[1]		

[1]Average of three determinations.

334. **PYROXENE AMPHIBOLITE.** Occurs in thick bands interbanded or interstratified with granulite, lot 22, rge. 8, Brandon tp., Berthier and Joliette counties, Que.

31–I–W½ (Anal. W.C. Adams) Ser. No. *1895–2*

Rather fine in grain, nearly black, indistinctly foliated rock with occasional narrow bands where one or other constituent predominates. The foliation is parallel to the banding and was produced by movements in the rock that were accompanied by a granulation of its constituents. It consists essentially of hornblende, pyroxene, plagioclase feldspar (granulated), a small amount of orthoclase feldspar, a little magnetite, apatite, and probably a few grains of quartz. The hornblende is deep brown and present in large amounts. Pyroxene is also present in large amounts and is in part hypersthene showing the usual pleochroism in yellow, red, and green tints and a parallel extinction.

F.D. Adams (1896b, p. 74)

335. **CORDIERITE AMPHIBOLITE.** Goldfields area, Sask.

74–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1947–3*

Radiating sheaves of light grey to brownish amphibole crystals up to 10 mm long enclosed in what appears to be a light grey, fine-grained, vitreous groundmass. "Groundmass" consists of single, slightly fractured

	334	335	336	337	338
SiO_2	49.76	49.37	49.29	48.81	47.42
Al_2O_3	17.53	17.99	8.39	16.62	12.83
Fe_2O_3	10.62[1]	9.80		1.17	2.57
FeO		4.04	4.61	7.47	10.53
MgO	7.96	12.62	12.72	8.28	6.52
CaO	10.57	1.33	25.38	10.30	8.98
Na_2O	3.05	0.58		3.31	1.71
K_2O	0.80	1.15		0.76	0.07
H_2O+		2.68		} 0.95	3.61
H_2O-		0.20			0.13
TiO_2		0.42		0.74	0.68
P_2O_5		0.29			0.56
MnO	0.36	0.06		0.12	0.14
CO_2		nil		0.55	3.55
S		0.06		0.06	0.10
Cl				0.03	
Loss on ignition	0.34				
Total	100.99	100.59	100.39	99.17	99.40
Less O≡S, Cl		0.02		0.03	0.04
		100.57		99.14	99.36

[1]Total Fe as Fe_2O_3

crystals of cordierite poikilitically enclosing sheaves of amphibole crystals, irregular biotite flakes of various sizes, small rounded blebs of quartz, iron oxide minerals, pyrite, and apatite. Mostly fresh, good cleavage, no pleochroism, altered irregularly to chloritic material. The amphibole is colourless with good cleavage and is optically positive. Biotite is close to phlogopite with black halos about minute zircons. (M)

A.M. Christie (1953, p. 16)

336. **PYROXENE.** Lot 22, rge. 9, Rawdon tp., Montcalm co., Que.

31–I–W½ (Anal. F.D. Adams) Ser. No. *1895–48*

Granular brown rock made up almost exclusively of a pyroxene associated with a colourless uniaxial and negative mineral, probably scapolite and a very few grains of pyrrhotite. The pyroxene is a very pale pinkish brown in thin sections and shows a very faint pleochroism.

F.D. Adams (1896b, p. 85)

337. **AMPHIBOLITE.** Forms disjointed dykes in the limestone about Jack Lake, con. 8, Methuen tp., Peterborough co., Ont.

31–C–W½ (Anal. M.F. Connor)? Ser. No. *1910–19*

Very uniform in character, and fine grained. In hand specimens the foliation is barely perceptible but is very distinct in thin sections. It is composed almost exclusively of hornblende and plagioclase. The only other constituents are biotite, very small amounts of iron ore, pyrite, and sphene. The hornblende is non-fibrous, rather greenish, occurring in an anastomosing meshwork of individuals with a prevailing alignment in one direction. Plagioclase is fresh and clear, basic in character, and has polysynthetic twinning.

F.D. Adams and A.E. Barlow (1910, p. 109)

338. **EPIDOTE AMPHIBOLITE.** Yellowknife, District of Mackenzie.

85–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1954–11*

(R.W. Boyle)

339. **AMPHIBOLITE.** Lat 64°08'45", long. 111°21'20", Mathew's Lake area, District of Mackenzie.

72–D–W½ (Anal. J.A. Maxwell) Ser. No. *1954–23*

Dark green, massive, medium-grained, mafic, metavolcanic rock containing hornblende, highly altered plagioclase, epidote, quartz, and a trace of magnetite. (M)

J.C.G. Moore (1956, pp. 7–8)

340. **AMPHIBOLITE.** Discontinuous bands or elongated masses from 6 inches to 5 feet in thickness, varying in width and in some cases pinching out completely in granite gneiss. On the west shore of Smoke Lake, con. 6, Peck tp., Nipissing district, Ont.

31–E–E½ (Anal. M.F. Connor) Ser. No. *1910–15*

The amphibolite is in some places massive and in others shows a faint foliation. It has a fine and even grain and an allotriomorphic structure. Consists of over 50% green hornblende, augite, a rhombic pyroxene, plagioclase, small amount of black opaque iron ore, a few grains of pyrite, and a trifling amount of calcite. The rock contains no quartz.

F.D. Adams and A.E. Barlow (1910, p. 62)

341. **HORNBLENDITE.** One of the larger zones of hornblendite that forms replacement veins in gabbro. East Sooke Peninsula, Vancouver Island, B.C.

92–B–W½ (Anal. M.F. Connor) Ser. No. *1919–24*

It is composed almost wholly of fresh, granulated hornblende and is characterized by great variability in width. The zones have no clean and definite vein wall but grade into the unaltered wall-rock.

H.C. Cooke (1919, p. 18)

	339	340	341	342	343
SiO_2	46.26	45.46	45.42	44.20	38.80
Al_2O_3	14.36	16.10	10.64	27.37	12.50
Fe_2O_3	3.21	3.42	3.03	2.71	6.57
FeO	11.62	8.63	10.22	6.58	8.20
MgO	6.91	7.30	13.82	2.78	13.10
CaO	10.28	10.80	11.84	11.83	11.42
Na_2O	1.83	2.71	2.17	) 2.88	1.60
K_2O	0.13	0.70	0.45		0.81
H_2O+	2.89	) 1.32	) 2.20		) 2.85
H_2O-	0.09				
TiO_2	1.23	2.10	0.30		1.60
P_2O_5	0.12	0.21	0.01		1.26
MnO	0.27	0.14	0.08	trace	0.23
CO_2	0.97	1.13	0.03		
S		0.17			
BaO		trace			
Cr_2O_3		0.04			
Loss on ignition				1.08	
Total	100.17	100.23	100.21	99.43	98.94
Less O ≡ S		0.06			
		100.17			
Sp.gr.					3.16

342. **HORNBLENDITE.** East side of Bute Inlet, just beyond Fawn Bluffs, B.C.

92–K–E½ (Anal. R.P.D. Graham) Ser. No. *1913–22*

J.A. Bancroft (1913, p. 87)

343. **HORNBLENDITE.** Forms dark coloured or femic bands of the banded Colquitz gneiss, interlaminated with the light-coloured salic bands. From the northwest of Prospect Lake in Lake District, Vancouver Island, B.C.

92–B–W½ (Anal. M.F. Connor) Ser. No. *1913–33*

Dark green, fine- to coarse-grained rock consisting essentially of hornblende. Hornblende crystals have a parallel arrangement and are 2 to 3 feet long and 2 to 3 inches wide. The hornblende is light-greenish brown, moderately pleochroic and frequently includes small grains of augite. Magnetite, apatite, and titanite also occur in fine-grained phases. The rock is moderately altered, secondary minerals being biotite, serpentine, chlorite, epidote, zoisite, calcite, and sericite. Pyrite and limonite occur in coarse-grained phases.

C.H. Clapp (1913, p. 69)

344. **AMPHIBOLITE.** Collected from a series of exposures in the cutting on the line of the Irondale, Bancroft, and Ottawa Railway, at Maxwells Crossing, Glamorgan tp., Haliburton co., Ont.

31–D–E½ (Anal. M.F. Connor) Ser. No. *1910–16*

Represents the first stage of alteration in a series of 3 rocks chosen to show the stages in the progressive change from limestone to amphibolite and displays an alteration of narrow, lighter- and darker-coloured bands. Possesses a more or less distinct foliation with mosaic structure. The lighter coloured bands consist of calcite, pyroxene, and a little hornblende. In the darker bands, the calcite is largely replaced by the silicates. The constituent minerals of these bands are scapolite, pyroxene, some hornblende, some calcite, and a little microcline. A very small amount of sphene is also present in the rock.

F.D. Adams and A.E. Barlow (1910, p. 104) *See also* Nos. 329, 332 *(1910–18, 17)*

345. **GNEISS.** Western portion of the Haliburton sheet, in the band that extends from Minden tp. into Stanhope tp., con. 5, Stanhope tp., Haliburton co., Ont.

31–E–E½ (Anal. M.F. Connor) Ser. No. *1910–22*

A highly altered paragneiss, showing a pale grey, fine-grained schistose rock, which weathers from a pale, yellowish brown to a deep brown. Consists of an interlocking aggregate mainly of quartz, together with a considerable proportion of feldspar. Irregular scales, plates, and imperfect crystals of graphite form the most abundant and conspicuous of the dark constituents. Pale-brownish or bleached biotite is intimately associated with the graphite. Minor minerals are muscovite, zircon, apatite, rutile, pyrite. Some quartz occurs in the form of small secondary veins. Feldspar includes microcline, orthoclase, and plagioclase (oligoclase?).

F.D. Adams and A.E. Barlow (1910, p. 187)

346. **GNEISS.** Near the highway about 1 mile west of North Seguin post office, Eglington quadrangle, Georgian Bay area, Ont.

31–E–W½ (Anal. H.W. Fairbairn ?) Ser. No. *1931–24*

Fine-grained, pink gneiss that shows bright pink bands of feldspar from 1/32 to 1/8 inches wide interbedded with the duller matrix. Contains veinlets of clear quartz, plainly visible under a lens, which vary considerably in their abundance and persistency along the bedding. There is little variation from the average grain size of 0.3 mm. Biotite occurs in elongated, irregular shreds, many of which are in contact with residual grains of magnetite. Potash feldspar is largely orthoclase, slightly altered microcline is not abundant. Plagioclase is scattered throughout the section and is fresher than the potash feldspar and shows albite twinning. Quartz occurs in irregular, slightly angular grains and has been recrystallized. Titanite is present as small rounded grains. (M)

(T.T. Quirke)

	344	345	346	347	348
SiO_2	32.88	79.70	78.05	76.99	75.02
Al_2O_3	9.04	8.29	8.80	12.45	13.90
Fe_2O_3	0.77	0.41	1.81	1.03	0.45
FeO	3.48	0.17	2.64	0.49	0.40
MgO	4.18	0.76	0.61	0.21	0.10
CaO	30.90	0.67	0.61	0.98	1.16
Na_2O	1.17	1.43	0.46[1]	3.46	3.06
K_2O	0.85	4.11	6.67	4.29	5.37
H_2O+, H_2O-	1.08	0.70	0.14	0.26	0.95
TiO_2	0.49	0.30	0.21		0.04
P_2O_5		0.04			0.15
MnO		0.03		trace	0.10
CO_2	15.20			nil	
C (graphite)		3.00			
BaO		0.08			
Total	100.04	99.69	100.00	100.16	100.70
Sp.gr.					2.63

[1] By difference

347. **GNEISS.** Lot 10, con. 5, Livingstone tp., Haliburton co., Ont.

31–E–E½ (Anal. N. Norton Evans) Ser. No. *1910–14*

Fine-grained reddish gneiss, with coarse stringers, and composed essentially of feldspar and quartz with only a small amount of biotite. Untwinned feldspars, orthoclase, and microcline are present in large amount. A little iron ore and very minute individuals of apatite and zircon are also present.

F.D. Adams and A.E. Barlow (1910, p. 54)

348. **GNEISS.** Light coloured or salic bands from the light and dark banded Colquitz gneiss exposed in the Small Hill, 1 mile north of Prospect Lake, Lake District, Vancouver Island, B.C.

92–B–W½ (Anal. M.F. Connor) Ser. No. *1913–32*

Light greenish grey to white, fine- to medium-grained rock, gneissic to schistose in texture. Cut by veinlets of quartz, sericite, and calcite; pyrite frequently occurs in disseminated grains. The essential minerals are quartz, orthoclase or microperthite, and oligoclase ($Ab_{85}An_{15}$). Accessory minerals are hornblende, biotite, magnetite, titanite, and apatite all in small amounts. Actinolite, epidote, chlorite, sericite, and kaolin, as well as quartz and calcite veinlets, are secondary.

C.H. Clapp (1913, p. 67)

349. **GNEISS.** Occurs in well defined bands from a few inches to several feet in thickness, interstratified with quartzite, which is often highly garnetiferous. Darwin's Falls, near the village of Rawdon, rge. 5, Rawdon tp., Montcalm co., Que.

31–I–W½ (Anal. W.C. Adams) Ser. No. *1894–8*

Highly quartzose garnetiferous gneiss.

F.D. Adams (1896a, p. 101)

350. **GNEISS.** Methuen batholith, from the shore of Bottle Lake, lot 17, con. 5, Methuen tp., Peterborough co., Ont.

31–C–W½ (Anal. M.F. Connor) Ser. No. *1910–13*

Fine-grained, red gneiss consisting of microcline and plagioclase, with small amounts of quartz and of an untwinned feldspar. The minor constituents are biotite and hornblende.

F.D. Adams and A.E. Barlow (1910, p. 56)

351. **GRANITE GNEISS.** North end of Lake Keepawa, on the west shore and near entrance of Taggart Bay, Pontiac co., Que.

31–L–W½ (Anal. F.G. Wait) Ser. No. *1894–4*

Deep, flesh-red, massive and granitic rock, with foliation imparted by the parallel disposition of the coloured constituents. It is highly feldspathic, and only very occasional thin bands of basic material occur which are at all continuous. It consists of much microcline, orthoclase, plagioclase, and quartz, with smaller quantities of biotite and epidote. Sphene, sericite, chlorite, apatite, allenite, and zircon are present as accidental or secondary minerals. The feldspar and quartz have commonly undergone advanced granulation, whereas the surviving large individuals exhibit marked undulous extinction. Microcline is abundant.

G.C. Hoffmann (1898, p. 18)

352. **GRANITE GNEISS.** In the middle of the eastern phase of the Remmel batholith, east of the roof pendant of Ashnola gabbro, 1.8 miles south of the International Boundary, U.S.A.

92–H–E½ (Anal. M.F. Connor) Ser. No. *1912–74*

A light grey, medium-grained, somewhat gneissic granite, weathering light brown. Consists of narrow bands of highly micaceous gneiss alternating with parallel, much broader bands of less micaceous gneiss. The batholith here has undergone its maximum shearing and metamorphism.

	349	350	351	352	353	354
SiO_2	74.70	73.33	71.69	70.91	70.73	69.39
Al_2O_3	8.88	13.55	14.84	16.18	14.29	17.46
Fe_2O_3	9.64	0.58		0.51	1.02	
FeO		1.53	1.25	1.09	1.92	1.38
MgO	1.87	0.45	0.37	0.37	0.64	0.52
CaO	1.07	1.66	1.03	2.92	1.50	2.14
Na_2O	0.42	5.01	3.13	1.33	2.54	5.18
K_2O	0.95	3.12	7.09	5.53	6.55	2.77
H_2O+		0.45	0.49	0.12	0.14	0.47
H_2O-			0.10	0.03	0.14	0.06
TiO_2		0.17		0.20	0.44	
P_2O_5				0.11	0.22	
MnO	0.50	0.04	trace	0.04	0.04	
CO_2					nil	
BaO				0.10		
ZrO_2					nil	
Loss on ignition	1.05					
Total	99.08	99.89	99.99	99.44	100.17	99.37
Sp.gr.				2.654		

The essential constituents are: quartz, biotite, orthoclase, and plagioclase, the latter probably andesine. The accessory constituents are: rare apatite, zircon and magnetite grains. A few reddish garnets occasionally are developed. The material of this and similar bands has been wholly recrystallized giving a hypidiomorphic granular texture. There is seldom any indication of straining or crushing of minerals. (M)

R.A. Daly (1912, p. 446)

353. **GRANITE GNEISS (CHARNOCKITE).** Three miles west by south of Nunata, on south point of the island, Cumberland Sound, Baffin Island.

26–J–E½ (Anal. J.A. Maxwell) Ser. No. *1954–17*

Massive rock, greenish coloured with coarse-grained feldspar porphyroblasts set in an equigranular coarse-grained groundmass of green feldspar, ferromagnesian minerals, and quartz.

(G.C. Riley)

354. **GRANITITE GNEISS.** North end of Lake Keepawa, south shore of McLaren Bay, Pontiac co., Que.

31–L–W½ (Anal. F.G. Wait) Ser. No. *1896–7*

Light-reddish grey, rather fine-grained micaceous granitic gneiss showing only indistinct foliation. It is composed of orthoclase, microcline, plagioclase, quartz, and biotite, with a little apatite, zircon, sphene, magnetite, and occasional minute individuals of secondary muscovite and epidote. Biotite is slightly altered to chlorite in some instances and occurs for the most part in small isolated patches possessing a rude parallelism and rarely aggregated together.

G.C. Hoffmann (1898, p. 19)

355. **GNEISS.** Logan's typical "Fundamental Gneiss" forming almost the entire mass of Trembling Mountain, a long ridge rising on the east side of Trembling Lake, Grandison tp., Terrebonne co., Que.

31–J–E½ (Anal. F.D. Adams) Ser. No. *1894–5*

A rather fine-grained gneiss, uniform in character, which in thin section resembles a crushed or granulated hornblende granite.

F.D. Adams (1896a, p. 98)

356. **GNEISS.** Grenville, Argenteuil co., Que.

31–G–E½ (Anal. T.S. Hunt) Ser. No. *1858–17*

A reddish, feldspathic gneiss in which orthoclase was the predominant mineral.

T.S. Hunt (1859, p. 193)

357. **GNEISS.** North side of Hopkins Bay, near the contact between the gneiss and mica syenite gneiss, Rainy Lake, Rainy River district, Ont.

52–C–W½ (Anal. M.F. Connor) Ser. No. *1913–42*

Grey, banded gneiss, far from homogeneous despite its uniform grey appearance. The colour varies from very dark to very light according to the proportions of biotite and feldspar present. These two shades are disposed in parallel bands, grading into each other. There is no cataclastic structure. The light coloured parts are composed of acid plagioclase and orthoclase with subordinate quartz and biotite. The accessories are epidote, titanite, apatite, pyrite. These minerals are perfectly fresh and the rock has a hypidiomorphic granular structure. The dark coloured parts contain the same minerals in different proportions. There is a great abundance of biotite, epidote, titanite, and apatite. The structure is also hypidiomorphic granular.

A.C. Lawson (1913, p. 93)

358. **GRANITITE GNEISS.** North end of Opimika Narrows, west shore of Lake Timiskaming, Nipissing district, Ont.

31–M–W½ (Anal. F.G. Wait) Ser. No. *1896–6*

Ordinary grey gneiss, distinctly foliated and consisting of alternating bands of light coloured portions made up chiefly of quartz and feldspar

	355	356	357	358	359
SiO_2	69.24	69.00	68.62	67.74	67.72
Al_2O_3	14.85	17.90	15.70	16.13	14.69
Fe_2O_3	2.62		1.66	1.50	2.07
FeO			1.77	1.96	3.72
MgO	0.97		1.28	1.36	1.00
CaO	2.10	2.80	3.56	4.41	4.94
Na_2O	4.30	3.70	5.08	4.92	3.39
K_2O	4.33	3.86	1.31	1.30	1.28
H_2O+			0.56	0.86	) 0.25
H_2O-			0.10	0.10	
TiO_2			0.26		0.30
P_2O_5			0.10		
MnO	0.45		0.07	trace	
CO_2			trace		
S			0.03		
Cl			nil		
BaO	0.70		0.02		
Loss on ignition		1.00			
Total	99.56	98.26	100.12	100.28	99.36
Less O≡ S			0.01		
			100.11		

and darker bands composed almost wholly of the coloured constituents. Quartz, orthoclase, plagioclase, biotite, and epidote are principal constituents. Epidote and titanite are common inclusions in the mica.

G.C. Hoffmann (1898, p. 19)

359. **GNEISS.** Intruded into volcanic and sedimentary rocks, near Small Lake north of Wabishkok Lake, Amisk-Athapapuskow Lake district, Sask.

63–N–W½ (Anal. M.F. Connor) Ser. No. *1918–4*

A pink-weathering rock with more or less pronounced gneissic structure. On fresh fractures, where banding is not very distinct, it is grey; in well banded specimens, it is pink and black. The black bands are not regular but interfinger with the lighter coloured bands. The feldspars in the lighter bands are pink and large enough to show good cleavage faces.

E.L. Bruce (1918, p. 39)

360. **GRANITE GNEISS.** West shore of Lake Wicksteed, tp. 8E, Nipissing district, Ont.

31–L–W½ (Anal. F.G. Wait) Ser. No. *1896–5*

Rather coarse-grained, greyish indistinctly foliated rock, much stained with yellowish brown iron oxide and showing large phenocrysts of white orthoclase. The chief minerals are orthoclase, microcline, plagioclase, quartz, biotite, and muscovite. Apatite, zircon, epidote, zoisite, allanite (?), and pyrite were also noted in very small quantities. Muscovite is primary and intergrown with perfectly fresh reddish brown biotite.

G.C. Hoffmann (1898, p. 19)

361. **PORPHYRITIC GRANITE GNEISS.** From the contact of granite and banded paragneiss about 1 mile SE of Runa Lake (lat. 61°24', long. 111°15'), south of Thubun Lake, O'Connor Lake area, District of Mackenzie.

75–E–W½ (Anal. J.A. Maxwell) Ser. No. *1954–42*

Pink porphyroblasts of orthoclase and plagioclase, sometimes oval in shape, forming either lenticles or bands marking the gneissosity. The groundmass is composed of biotite, chlorite, quartz, and occasional pyrite enclosed in feldspar. Some microcline and strained quartz form phenocrysts. (M)

B.D. Prusti (1954) *See also* Nos. 4, 23, 369 *(1955–2, 4; 1954–38)*

362. **CYANITE (KYANITE) GRANITE GNEISS.** Half mile north of Snake Creek, east shore of the Ottawa River, Pontiac co., Que.

31–L–E½ (Anal. F.G. Wait) Ser. No. *1896–3*

Coarse-grained granitic rock with a distinctly banded structure caused by layers rich in biotite, alternating with layers of quartz and feldspar relatively free from that mineral. The distinctive feature of the rock is the abundance, in parts of it, of a light to deep blue kyanite in large columnar individuals. Deep-pink garnets are also plentiful. The rock consists of orthoclase, plagioclase, quartz, biotite, kyanite, and garnet with smaller quantities of muscovite, graphite, titanite, zircon, apatite, pyrite, pyrrhotite, and epidote. It is typically holocrystalline and granitic and shows no extreme evidence of granulation.

G.C. Hoffmann (1898, p. 18)

363. **GRANITE GNEISS (CHARNOCKITE).** Quickstep Harbour, Cumberland Sound, Baffin Island.

26–J–E½ (Anal. J.A. Maxwell) Ser. No. *1954–19*

Holocrystalline, coarse-grained, unequigranular porphyroblastic; greenish brown, fresh and weathered surfaces.

(G.C. Riley)

364. **STAUROLITE GARNET GNEISS.** Formation 5, Morton Lake map-area, Man.

63–K–E½ (Anal. R.J.C. Fabry) Ser. No. *1947–15*

Fine-to medium-grained, slightly schistose rock peppered with crystals of staurolite as much as half an inch long and 1/10 inch wide.

J.M. Harrison (1949b, p. 26) *See also* Nos. 315, 372 *(1947–14, 16)*

	360	361	362	363	364	365
SiO_2	67.50	67.31	66.94	66.73	64.63	64.04
Al_2O_3	18.23	16.06	17.84	15.48	19.00	15.83
Fe_2O_3		1.35		0.88	1.56	2.16
FeO	2.39	2.28	4.30	3.19	3.63	2.40
MgO	1.56	1.22	1.82	1.17	2.49	2.72
CaO	1.85	3.09	1.86	2.60	3.48	3.60
Na_2O	3.79	3.49	1.85	2.50	1.54	3.52
K_2O	4.25	3.50	3.36	5.66	1.60	1.43
H_2O+	0.90	0.53	1.75	0.30	0.92	) 1.60
H_2O-	0.08	0.10	0.15	0.13	0.20	
TiO_2		0.48		0.75	0.42	0.30
P_2O_5		0.19		0.20	0.21	1.56
MnO		0.05	trace	0.04		0.15
CO_2		nil		0.02	trace	
C				0.06	0.64	
ZrO_2				0.03		
Total	100.55	99.65	99.87	99.74	100.32	99.31
Sp.gr.						2.74

365. **QUARTZ DIORITE GNEISS.** From the Colquitz gneiss, Smiths Hill, from a rock cut made for the Victoria City reservoirs, Victoria, Vancouver Island, B.C.

92–B–W½ (Anal. M.F. Connor) Ser. No. *1913–31*

Grey rock of medium grain and of gneissic to schistose texture consisting chiefly of altered feldspar, quartz, hornblende, and biotite. Orthoclase is present but can seldom be distinguished from andesine. Accessory minerals are magnetite, apatite, rarely titanite. Quartz is largely interstitial. It has been much altered to epidote, sericite, and kaolin, and is frequently cut by veinlets of quartz, sericite, epidote, and calcite. The plagioclase is acid andesine ($Ab_{70}An_{30}$). (M)

C.H. Clapp (1913, p. 64)

366. **GNEISS.** Of sedimentary origin, occurring with altered lava, east side of Crowduck Bay, Wekusko Lake, Man.

63–J–W½ (Anal. M.F. Connor) Ser. No. *1916–8*

Rusty-weathering, granular rock consisting chiefly of quartz and biotite but with garnets developed plentifully in some localities.

E.L. Bruce (1917, p. 167)

367. **GRANITE GNEISS.** Pangnirtung, between R.C.M.P. living quarters and triangulation station, Baffin Island.

26–I–W½ (Anal. J.A. Maxwell) Ser. No. *1954–18*

Medium- to coarse-grained, equigranular, gneissic rock, grading from a finely banded unit into a mixture and then to a massive appearance. Pyroxene is related to the more massive sections of the rock.

(G.C. Riley)

368. **GNEISS.** Occurs in flat-lying, thick bands interstratified with white garnetiferous quartzite. St. Jean de Matha, Joliette co., Que.

31–I–W½ (Anal. N. Norton Evans) Ser. No. *1894–6*

A fine-grained garnetiferous sillimanite gneiss, containing also much quartz and orthoclase. Graphite and pyrite are also present, the latter causing the gneiss to weather a very rusty colour.

F.D. Adams (1896a, p. 99)

369. **GRANITIZED ROCK.** Near the contact of granite and mica schist, southwest end of Thubun Lake, 1½ miles SW of the shore, O'Connor Lake area, District of Mackenzie.

75–E–W½ (Anal. J.A. Maxwell) Ser. No. *1954–38*

The hand specimen shows porphyroblasts of feldspar in a dark, fine-grained groundmass composed of biotite, chlorite, and sulphides (mainly pyrite). An irregular veinlet of quartz and pink feldspar crosses the specimen. Porphyroblasts of oligoclase (An_{24}) are rimmed by biotite and fine-grained quartz. Quartz grains are irregular and strained. Biotite, chlorite and pyrite form the rest. Biotite is greenish brown and strongly pleochroic. (M)

B.D. Prusti (1954)   *See also* Nos. 4, 23, 361 *(1955–2, 4; 1954–42)*

370. **GARNET GNEISS.** Lot 12, rge. 1, Portland East tp., Papineau co., Que.

31–G–W½   (Anal. M.F. Connor)   Ser. No. *1918–1*

M.E. Wilson (1918, p. 132)

371. **GNEISS.** North and northeast of Lachute, Argenteuil co., Que.

31–G–E½   (Anal. M. Dittrich)   Ser. No. *1899–6*

Uniformly medium-grained rock showing on cross fracture a typical stratified structure occasioned by reddish layers composed mainly of potash feldspar and some quartz alternating with layers rich in hornblende and mica. Essential minerals are feldspar, hornblende, and decreasing quantities of quartz and brown mica. Apatite and zircon are accessory constituents in relatively large quantities. There is no ragged development and frequent intergrowth and interpenetration of the constituents so common in other gneisses. The feldspar is chiefly orthoclase and microcline and some plagioclase. The hornblende is green and transparent, with irregular outline.

A. Osann (1902, p. 9)

	366	367	368	369	370	371
SiO_2	63.84	62.90	61.96	61.69	60.33	59.89
Al_2O_3	20.34	14.17	19.73	16.02	17.17	17.70
Fe_2O_3	3.34	2.34		0.95	3.93	1.95
FeO	3.98	4.94	4.60	7.08	6.55	2.71
MgO	2.20	2.18	1.81	2.87	3.35	1.56
CaO	0.64	4.21	0.35	2.08	0.90	2.53
Na_2O	0.95	2.42	0.79	2.77	0.73	5.74
K_2O	2.42	4.69	2.50	2.54	4.57	5.83
H_2O+	} 1.05	0.35		2.17	} 1.00	} 0.29
H_2O-		0.14		0.19		
TiO_2	0.80	0.97	1.66	1.06	1.52	0.96
P_2O_5		0.24		0.03	0.04	0.17
MnO		0.10	trace	0.08	0.09	
CO_2		0.01		0.12		0.39
ZrO_2		nil				
FeS_2			4.33			
Loss on ignition			1.82			
Total	99.56	99.66	99.55	99.65	100.18	99.72
Sp. gr.					2.976	

372. **SILLIMANITE STAUROLITE GNEISS.** Formation 5, S end of Corley Lake, Morton Lake map-area, Man.

63–K–E½ (Anal. R.J.C. Fabry) Ser. No. *1947–16*

Very schistose, rather coarse grained, containing poorly formed crystals of staurolite and intergrowths of sillimanite and quartz about ¼ inch in diameter. This represents the highest grade metamorphism of argillaceous rocks. (M)

J.M. Harrison (1949b, p. 26) *See also* Nos. 315, 364 *(1947–14, 15)*

373. **GNEISS.** Interstratified with quartzite and granular limestone on the right bank of the Ottawa River, south of Montebello, Papineau co., Que.

31–G–E½ (Anal. M. Dittrich) Ser. No. *1899–7*

Fine, even-grained rock with constituents evenly distributed. Consists of microcline and a little orthoclase with equal amounts of pleochroic biotite, rare aggregations of colourless mica, considerable quantities of tourmaline and varying amounts of quartz, apatite, and ores. The mica plates are arranged in parallel direction. All constituents are remarkably fresh.

A. Osann (1902, p. 5)

374. **GNEISS.** Near a band of crystalline limestone, which occupies the bed of Trembling Lake, west shore of Trembling Lake, Granison tp., Terrebonne co., Que.

31–J–E½ (Anal. W.C. Adams) Ser. No. *1894–7*

A fine-grained, dark grey gneiss composed of quartz and orthoclase with much biotite and containing little white streaks of sillimanite, which were evidently at one time continuous little bands.

F.D. Adams (1896a, p. 99)

375. **GNEISS.** Occurs in well defined bands, interstratified with a greyish-weathering, garnetiferous gneiss. Lot 20, rge. 7, Rawdon tp., Montcalm co., Que.

31–I–W½ (Anal. W.C. Adams) Ser. No. *1894–9*

A fine-grained, greenish white, indistinctly foliated gneiss, presenting on fresh fracture a finely speckled appearance. It consists essentially of orthoclase, pale green pyroxene (malacolite), colourless scapolite, with accessory pyrite and pyrrhotite, graphite, and pale brownish grains of sphene. Pyrite and pyrrhotite are associated in irregularly shaped masses with minutely banded structure parallel to their sides and are in places decomposed to hematite. Graphite forms little flakes, often intimately associated with the pyrite.

F.D. Adams (1896a, p. 100)

376. GNEISS. Recrystallized limy sediments mapped as hornblende plagioclase gneiss and pyroclastic breccia. Near Sherridon, on Cree Lake, Man.

63–N–W½ (Anal. R.J.C. Fabry) Ser. No. *1949–3*

Weathers much as limestone does but contains many garnets and has peculiar chicken-track weathered surfaces due to hornblende.

J.M. Harrison (1951, p. 40) *See also* Nos. 378, 381 *(1949–5, 6)*

	372	373	374	375	376
SiO_2	58.90	58.68	57.66	54.89	53.36
Al_2O_3	21.70	16.17	22.83	13.67	16.40
Fe_2O_3	1.20	1.66		1.35	1.02
FeO	5.10	5.69	7.74		6.49
MgO	2.63	3.71	3.56	4.70	3.17
CaO	1.54	0.30	1.16	5.63	12.57
Na_2O	1.39	0.83	0.60	1.95	1.51
K_2O	2.41	8.68	5.72	8.34	1.40
H_2O+	1.32	1.65			1.16
H_2O-	0.46				0.18
TiO_2	0.63	1.39		1.66	0.56
P_2O_5	0.50	0.31			
MnO			trace	0.62	0.26
CO_2	nil	0.36			0.36
C	1.56				
FeS_2				4.43	2.19
Loss on ignition			1.50	2.76[1]	
Total	99.34	99.43	100.77	100.00	100.63

[1] Water and graphite, by difference

377. HORNBLENDE FELDSPAR GNEISS. Giauque Lake, District of Mackenzie.

85–O–E½ (Anal. R.J.C. Fabry) Ser. No. *1950–5*

The banded or gneissic structure is defined by segregation of the mafic minerals into bands or unequal streaks that rest in a base composed mainly of felsic minerals.

L.P. Tremblay (1952, p. 9)

378. GNEISS. From area mapped as hornblende plagioclase garnet gneiss. In a railroad cut north of the quartzite, Cree and Found Lakes, near Sherridon, Man.

63–N–W½ (Anal. R.J.C. Fabry) Ser. No. *1949–5*

A very dark and quite coarse-grained rock in which garnets make up 10–15% of the rock on the average, but up to 30% in irregular patches. Plagioclase and quartz vary in amount but mostly are very subordinate.

J.M. Harrison (1951, p. 40) *See also* Nos. 376, 381 *(1949–3, 6)*

379. **SILLIMANITE GARNET GNEISS.** Grenville Series, lot 19, rge. 12, Buckingham tp., Papineau co., Que.

31–G–W½ (Anal. M.F. Connor) Ser. No. *1918–2*

M.E. Wilson (1918, p. 132)

380. **GABBRO-DIORITE GNEISS.** Wark batholith, at road cut ½ mile south of Mount Tolmie, Victoria district, Vancouver Island, B.C.

92–B–W½ (Anal. M.F. Connor) Ser. No. *1913–30*

A dark greenish rock of medium to coarse grain and gneissic texture, commonly cut by quartz veinlets and impregnated slightly with pyrite. The essential constituents are plagioclase feldspar, varying from labradorite to andesine and pale green hornblende. The accessory constituents are varying amounts of quartz, occurring in the interstices of other minerals, biotite, magnetite, titanite, and apatite. The hornblende contains a small nucleus of augite, partly and irregularly replaced by the hornblende. Secondary minerals are biotite, chlorite, epidote, serpentine, sericite, kaolin, and limonite. Veinlets of quartz, sericite, and calcite are common. The specimen analysed was quartz free. (M)

C.H. Clapp (1913, p. 59)

381. **HORNBLENDE GNEISS.** On the shoreline of Cree and Found Lakes, on the north side of the exposure south of the quartzite just east of railroad, near Sherridon, Man.

63–N–W½ (Anal. R.J.C. Fabry) Ser. No. *1949–6*

	377	378	379	380	381
SiO_2	51.29	51.20	49.61	48.68	47.29
Al_2O_3	13.76	17.66	22.00	18.05	12.85
Fe_2O_3	8.80	0.40	1.93	3.41	0.80
FeO	8.40	9.38	9.55	6.44	10.14
MgO	4.38	6.50	6.33	2.82	11.78
CaO	9.00	8.64	0.36	10.00	11.55
Na_2O	1.55	1.66	1.40	3.18	1.08
K_2O	0.18	0.48	3.88	1.60	0.32
H_2O+	1.34	2.17	2.20	2.40	1.20
H_2O-	0.14	0.11			0.10
TiO_2	0.68	0.30	2.00	0.80	0.78
P_2O_5		0.51	0.06	2.01	0.46
MnO		0.07	0.05	0.20	0.15
CO_2		0.58			1.20
C		0.40			0.56
Total	99.52	100.06	99.37	99.59	100.26
Sp. gr.				2.91	

Distinctly gneissic medium- to rather coarse-grained, pseudo-diorite type of gneiss with speckled weathering. To the south is strongly folded and has considerable mineralization.

J.M. Harrison (1951, p. 40) *See also* Nos. 376, 378 *(1949–3, 5)*

382. **QUARTZ MICA DIORITE GNEISS.** On Ottertail Creek, at the lower end of 7th portage, below North Bay and Temiscaming Rd., Nipissing district, Ont.

31–L–W½ (Anal. F.G. Wait) Ser. No. *1898–8*

Dark-grey, almost black, glistening, evenly foliated rock stained in places with iron oxide. It is composed of plagioclase, orthoclase, quartz, hornblende, and biotite with sphene, apatite, zircon, pyrite, magnetite, and limonite as accessory minerals. The hornblende is much more abundant than the biotite. The rock constitutes the dark basic bands so characteristic of exposures of grey gneiss.

G.C. Hoffmann (1898, p. 19)

383. **GNEISS.** Recrystallized limy sediments (mapped as anorthosite) on the shoreline of Cree and Found Lakes, Sherridon, Man.

63–N–W½ (Anal. R.J.C. Fabry) Ser. No. *1949–2*

J.M. Harrison (1951, p. 39)

384. **METADIORITE.** 250 yards upstream from the upper bridge over Pine Creek, leading to Spruce Creek on the north bank, Atlin Lake map-area, Cassiar district, B.C.

104–N–W½ (Anal. R.J.C. Fabry) Ser. No. *1953–11*

Medium-grained, hypautomorphic, dark green rock, consisting of 55% actinolite, 42% highly altered plagioclase and recrystallized, untwinned feldspar, 3% leucoxene and associated magnetite, and traces of clinozoisite.

J.D. Aitken (1959) *See also* Nos. 386, 424 *(1953–9, 10)*

385. **METAGABBRO.** Lies on the west limb of an anticline which strikes NW and plunges SE and is overlain by pillow lavas and underlain by 'knobby' (tremolite) serpentine. East of McNeill Lake, Que.

23–P–W½ (Anal. R.J.C. Fabry) Ser. No. *1951–22*

Pale green rock consisting of about 70% colourless amphibole, 25% clinozoisite, and 2% fresh sodic plagioclase.

(W.F. Fahrig) *See also* Nos. 214, 387, 389, 393, 444 *(1951–20, 19, 24, 23, 21)*

386. **SPILITE.** 400 feet toward Atlin Lake from Station 9A, on McNee Road, below Monarch Mountain, Cassiar district, B.C.

104–N–W½ (Anal. R.J.C. Fabry) Ser. No. *1953–9*

Grey-green, very fine grained rock with variolitic texture. Laths of plagioclase are easily visible. Several small amygdules of penninite. It consists of about 55% of clear albite (An_5), about 40% augite, partly altered to green amphibole, minor biotite associated with amphibole, and minor clinozoisite in veinlets.

(J.D. Aitken) *See also* Nos. 384, 424 *(1953–11, 10)*

	382	383	384	385	386
SiO_2	44.92	40.65	50.70	50.60	50.10
Al_2O_3	18.88	18.86	14.03	9.78	13.48
Fe_2O_3	2.73	0.33	7.33	1.08	9.86
FeO	13.76	2.60	4.06	9.68	3.62
MgO	5.38	1.27	7.37	11.81	6.33
CaO	9.07	21.64	11.28	11.73	9.83
Na_2O	2.94	2.17	2.57	1.88	2.60
K_2O	0.53	2.10	0.22	0.34	0.39
H_2O+	1.62	0.95	1.11	1.89	2.89
H_2O-	0.20	0.19	0.23	0.11	0.16
TiO_2		0.63	1.05	0.28	0.95
P_2O_5		0.29	0.04	0.08	0.06
MnO	0.26	0.50	0.07	0.12	0.16
CO_2		7.89	nil	nil	nil
S			0.16	0.10	0.41
C		0.71			
Cr_2O_3				0.09	
NiO				nil	
Total	100.29	100.68 (100.78)	100.42 (100.22)	99.57	100.74 (100.84)
Less O≡ S			0.06	0.04	0.15
			100.36 (100.30)	99.53	100.59 (100.69)

387. **METABASALT.** The dominant member of the Doublet Group, which includes metagabbros, peridotites, and sediments. Almost universally well pillowed. Griffis Lake area, Que.

23–P–W½ (Anal. R.J.C. Fabry) Ser. No. *1951–19*

Fine-grained, pale green, rusty weathering rock, consisting of a fine-grained mass of pale green actinolite, altered plagioclase (clinozoisite) and chlorite, amounting to 50%, 40%, and 10% respectively.

(W.F. Fahrig) *See also* Nos. 214, 385, 389, 393, 444 *(1951–20, 22, 24, 23, 21)*

388. **METABASALT**. Makes up much the largest part of the Bolton Mountains, Potton and Bolton tps., Que.

31–H–E½ (Anal. F.A. Gonyer) Ser. No. *1931–35*

The metabasalt is of two types, a uralite rock and an ankerite rock (see No. 395). The uralite rock is either massive or schistose, the former is grey-green and fine textured with veinlets of epidote, calcite, quartz, pyrite, and pyrrhotite irregularly distributed. The latter is highly chloritic and dark green, cleavage surfaces are irregular, and cross jointing is usually developed. The essential minerals are irregular, small grains of indeterminate feldspar covered with secondary products, abundant blue grains of clinozoisite, disseminated flakes, solid patches, and cross-cutting veinlets of chlorite, abundant minute shreds and flakes of uralite, epidote, and titanite. Accessory minerals are calcite, quartz, sericite, pyrite, and pyrrhotite. Olivine and green hornblende are the only primary silicates whose relicts remain.

(T.H. Clark)

389. **METAGABBRO**. Band lying directly above a northeast limb of McNeill Lake serpentinite anticline, 7 miles E of McNeill Lake, Que.

23–P–W½ (Anal. R.J.C. Fabry) Ser. No. *1951–24*

Consists of unoriented 1 mm needles and masses of hornblende and plagioclase with biotite, clinozoisite, chlorite, and skeletal ilmenite (now altered to leucoxene). Hornblende is strongly pleochroic (blue-green to pale yellow) and contains patches altering to biotite.

(W.F. Fahrig) *See also* Nos. 214, 385, 387, 393, 444
(1951–20, 22, 19, 23, 21)

390. **METAGABBRO AND METADIORITE**. Dykes. Yellowknife Greenstone Belt, District of Mackenzie.

85–J–E½ (Anal. J.A. Maxwell) Ser. No. *1955–16*

R.W. Boyle (1961, p. 67)

391. **METABASALT**. Slightly altered Athabaskan flow 11 inches from a pitchblende vein, Martin Lake map-area, Sask.

74–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–16*

Fine-grained, well preserved, ophitic texture with interstitial chlorite, carbonate, and hematite, the last occurring as flakes of specularite and as an earthy, red powder. The plagioclase feldspar laths are lightly altered to white mica and in some cases the alteration products are being replaced by clear albite around the perimeters. Poikilitic patches of carbonate are visible on the surfaces of hand specimens.

K.R. Dawson (1951, p. 21) *See also* Nos. 299, 304, 394, 396 400
(1951–11, 14, 15, 17, 12)

	387	388	389	390	391
SiO_2	49.86	49.44	49.20	48.76	47.98
Al_2O_3	15.07	15.92	14.15	14.63	16.41
Fe_2O_3	2.39	2.33	5.12	1.67	9.23
FeO	9.63	8.11	10.95	9.87	2.67
MgO	6.34	6.10	4.99	8.08	3.62
CaO	9.64	8.20	8.73	9.94	5.77
Na_2O	1.76	3.06	2.56	2.13	4.42
K_2O	0.43	0.50	0.75	0.58	1.54
H_2O+	3.18	} 3.40	1.46	2.43	2.34
H_2O-	0.34		0.31	0.12	0.76
TiO_2	0.53	1.43	0.74	0.89	1.16
P_2O_5	0.20		0.24	0.08	0.87
MnO	0.37	0.10	0.09	0.24	0.01
CO_2	trace	1.31	0.36	0.18	3.10
S	0.15		0.18	0.12	0.16
Cl				0.02	
C				0.06	
Cr_2O_3	trace			0.04	
NiO	nil		0.08		
Total	99.89	99.90	99.91	99.84	100.04
Less O≡ S, Cl	0.06		0.07	0.05	0.06
	99.83		99.84	99.79	99.98
Sp.gr.				2.968	

392. **BLOTCHY METAGABBRO.** Doublet Group, Point Lake, about 35 miles SSE of Schefferville, Newfoundland-Labrador.

23–I–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–25*

Very coarse-grained rock with crystals up to 1 cm consisting of dark green pyroxene and patches of altered plagioclase with some chalcopyrite and pyrite.

(J.M. Harrison)

393. **BLOTCHY METAGABBRO.** 2½ miles north of Lac Girard, Griffis Lake area, Que.

23–P–W½ (Anal. R.J.C. Fabry) Ser. No. *1951–23*

Irregular white blotches consisting of clusters of highly altered plagioclase crystals, now mainly clinozoisite, set in a medium-grained, dark green matrix of actinolite, plagioclase, and quartz. Actinolite is partly replaced by biotite. The blotches form about 20% of the rock mass.

(W.F. Fahrig) *See also* Nos. 214, 385, 387, 389, 444 *(1951–20, 22, 19, 24, 21)*

394. METABASALT. Athabaskan flow rock taken 18 inches from a radioactive vein, 1,500 feet east of the adit on the E shore of Martin Lake, Sask.

74–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–15*

Black, fine-grained metabasalt, locally amygdaloidal and elsewhere massive, with a well developed ophitic texture. The feldspar is commonly covered by white mica alteration. The remaining minerals are chlorite, hematite, and carbonate and commonly occur in interstices. The hematite consists of an earthy variety and specularite. (M)

K.R. Dawson (1951, p. 31) *See also* Nos. 299, 304, 391, 396, 400 *(1951–11, 14, 16, 17, 12)*

395. METABASALT. Makes up much of the largest part of the Bolton Mountains, Bolton and Potton tps., Brome co., Que.

31–H–E½ (Anal. F.A. Gonyer) Ser. No. *1931–36*

Metabasalt is of two types, a uralite rock (see No. 388) and a buff coloured ankerite rock, which forms small exposures. The ankerite rock is fine textured with carbonate rhombs visible. Dense veinlets and irregular patches of quartz and small pyrite cubes are found. It is usually massive but may be schistose. The rocks have characteristic rusty tops and may be covered by several inches of soft iron oxide. Altered plagioclase, mostly indeterminate because of fine mica flakes and other secondary substances, forms most of the fine groundmass. Large ankerite rhombs are the characteristic feature. Sericite is common in minute flakes and shreds, quartz is found in irregular patches and veinlets sometimes intergrown with feldspar, chlorite forms interstitial patches or large masses. The accessories are apatite, rutile, and rare epidote. No actinolite was found.

(T.H. Clark)

396. METABASALT. Flow interbedded with arkoses and other flows. Athabaskan in age, specimen taken within 4 inches of the pitchblende vein, 1,500 feet east of the adit on the E shore of Martin Lake, Sask.

74–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–17*

Fine-grained massive or amygdaloidal, highly reddened flow rock consisting of euhedral to subhedral feldspar laths forming an excellent ophitic texture. Other constituents fill the interstices and replace the feldspar, which is highly altered to white mica. At least a part of the feldspar is albite. (M)

K.R. Dawson (1951, p. 31) *See also* Nos. 299, 304, 391, 394, 400 *(1951–11, 14, 16, 15, 12)*

	392	393	394	395	396
SiO_2	47.22	46.90	46.07	42.64	40.93
Al_2O_3	16.57	18.19	16.29	14.42	15.94
Fe_2O_3	5.22	3.58	9.14	2.25	10.60
FeO	6.93	7.71	4.26	7.41	3.14
MgO	7.90	6.20	4.53	3.06	4.39
CaO	9.85	11.23	4.64	7.20	7.74
Na_2O	2.26	1.60	5.48	2.65	3.16
K_2O	0.21	0.53	1.56	0.41	1.69
H_2O+	2.34	2.24	3.08	) 2.58	3.15
H_2O-	0.01	0.18	0.40		0.31
TiO_2	0.53	0.84	0.63	1.04	1.37
P_2O_5	0.35	0.23	1.08		1.00
MnO	0.15	0.07	0.01	0.07	0.04
CO_2	nil	0.27	3.30	12.52	6.10
S.................	0.15	0.16	0.04		0.03
Cr_2O_3	0.01				
Organic matter				2.97	
Total	99.74 (99.70)	99.93	100.51	99.22	99.59
Less O≡S	0.06	0.06	0.02		0.01
	99.68 (99.64)	99.87	100.49		99.58
Sp.gr.			2.785		2.816

397. **METAPERIDOTITE.** Collected from the aureole of the La Motte massif, south end of lot 11, rge. 3, La Motte tp., Abitibi co., Que.

32–D–E½ (Anal. M. Staples) Ser. No. *1955–45*

Fine-grained, green structureless rock, weathering to a buff colour, with a distinctly soapy feel. Consisting of a fine-grained, felted aggregate of talc, chlorite, and calcite with scattered pyrite and magnetite grains. No visible quartz or feldspar.

(K.R. Dawson)

398. **MARBLE.** West shore, southern end of Nitinat Lake, northeast of the Indian Reservation, Vancouver Island, B.C.

92–C–E½ (Anal. F.G. Wait) Ser. No. *1912–15*

A pure, white marble, occurring in calcareous rocks in which there are many areas of white, usually coarsely crystalline limestone or marble but in which the larger portion of the original limestones appears to be altered by invading magmas. It consists essentially of calcite in irregular grains, firmly cemented by the same material. The accessory constituents are small in amount, consisting of quartz in very small grains, sericite and epidote; pyrite is usually present in small disseminated grains, weathering to limonite and slightly stained exposed surfaces.

C.H. Clapp (1912, p. 45)

399. GRANULITE. Found in beds or lenses intimately mixed with other sedimentary rock types or as lenses and patches in quartzite and greywacke. Giauque Lake, District of Mackenzie.

85–O–E½ (Anal. R.J.C. Fabry) Ser. No. *1950–2*

Fine- to coarse-grained, streaked or gneissic rock consisting of varying amounts of hornblende, biotite, garnet, andesine, quartz, epidote, and tourmaline.

L.P. Tremblay (1952, p. 17)

400. HEMATIZED QUARTZITE. Occurs beneath Tazin argillite and taken from the immediate vicinity of a radioactive vein, ½ mile E of Melville Lake, ¼ mile N of Beaverlodge Lake, Martin Lake map-area, Sask.

74–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–12*

Fine-grained, very thinly bedded rock with little or no variation in grain size. It carries disseminated hematite as a fine powder and red feldspar veinlets. Fine quartz is the dominant constituent with minor sericite occurring locally along the grains. Red carbonate is also present in veinlets.

K.R. Dawson (1951, p. 55) *See also* Nos. 299, 304, 391, 394, 396 *(1951–11, 14, 16, 15, 17)*

401. QUARTZ SERICITE ROCK. Associated with the quartz pyrophyllite rock, occurring with feldspathic andesites and dacites and formed by the metasomatic replacement of fragmental dacite of the Vancouver volcanics near an intrusive quartz diorite. Quarry of the British Columbia Pottery Company, Monteith Claim, on a peninsula in the northwestern part of Kyuquot Sound, between Kokshittle Arm and Easy Creek, Vancouver Island, B.C.

92–L–W½ (Anal. N.L. Turner) Ser. No. *1913–56*

Dense cherty, light bluish grey to flesh-coloured rock, consisting of quartz, sericite, pyrite, limonite, kaolin and, in places probably alunite or possibly pyrophyllite. Fine but irregular grains varying from 0.001 to 0.1 mm. Pyrite occurs in small regular crystals and apparently replaces the quartz and sericite and appears therefore to be of later formation. (M)

C.H. Clapp (1914b, p. 118) *See also* Nos. 252, 402, 406, 409, 414 *(1913–55–60)*

	397	398	399	400	401
SiO_2	39.26		62.76	95.51	87.80
Al_2O_3	5.16	0.40	14.30	1.86	9.08
Fe_2O_3	4.57		2.04	0.26	0.40
FeO	3.81		5.05	0.44	
MgO	27.97	0.42[1]	3.92	0.11	
CaO	5.04	96.89[2]	8.78	1.12	
Na_2O	0.03		0.98	0.49	0.02
K_2O	nil		0.85	0.23	1.70
H_2O+	6.18		1.03	0.21	1.04
H_2O-	0.18		0.23	0.15	
TiO_2	0.25		0.31	0.07	
P_2O_5	0.02	trace		0.05	
MnO	0.15			nil	
CO_2	7.30			nil	
S		0.01		0.06	
SO_3					trace
Cr_2O_3	0.27				
NiO	0.18				
Insoluble residue		2.64			
Total	100.37	100.36	100.25	100.56	100.04
Less O≡ S				0.02	
				100.54	
Sp.gr.	2.68				2.75

[1]As $MgCO_3$
[2]As $CaCO_3$

402. QUARTZ PYROPHYLLITE ROCK. Associated with quartz alunite rock occurring in feldspathic andesites and dacites and formed by the metasomatic replacement of the fragmental dacite of Vancouver volcanics near an intrusive quartz diorite. Quarry of the British Columbia Pottery Company, Monteith Claim, on a peninsula in the northwest part of Kyuquot Sound, between Kokshittle Arm and Easy Creek, Vancouver, Island, B.C.

92–L–W½ (Anal. N.L. Turner) Ser. No. *1913–57*

Pink to white, dense rock forming compact masses with a pronounced greasy feel and easily crushed to a smooth, very fine powder. It has been leached of pyrite. Minerals are essentially quartz and pyrophyllite, with accessory sericite, limonite, and kaolin. A small amount of unreplaced or secondary feldspar is present. Very fine grained, some of the quartz microphanitic. Pyrophyllite occurs in small flakes averaging about 0.01 mm in diameter, of irregular outline and roughly equidimensional. Sericite flakes have pronounced elongation. Kaolin occurs as a dense white, opaque substance in small regularly shaped patches. (M)

See also Nos. 252, 401, 406, 409, 414

C.H. Clapp (1914b, p. 118) *(1913–55, 56, 58–60)*

403. **ALTERED SYENITE.** In the vicinity of remarkable veins of chert cutting the syenite, and for a distance of 200 yards on either side of them. Grenville, Argenteuil co., Que.

31–G–E½ (Anal. T.S. Hunt) Ser. No. *1858–23*

In the altered rock the quartz remains unchanged, whereas the feldspar is somewhat unctuous to touch and has a somewhat waxy lustre and is reddish, or more often, pale green.

T.S. Hunt (1859, p. 190)

404. **ALTERED FELSITE.** Coxheath Hills, Watson Brook, Cape Breton Island, N.S.

11–K–E½ (Anal. G.C. Hoffmann) Ser. No. *1875–1*

Compact, massive, slightly foliated, pearl-grey, pinkish, slaty felsite. Though apparently of somewhat rare occurrence, occasional nodules of a translucent white quartz are present.

G.C. Hoffmann (1877, p. 424)

405. **QUARTZITE.** Kitchener quartzite from the contact zone of Moyie sill C, west of Moyie Mountain on the wagon road, immediately west of the Moyie River and the International Boundary Line, B.C.

82–F–E½ (Anal. M. Dittrich) Ser. No. *1912–40*

	402	403	404	405	406
SiO_2	81.94	80.65	76.26	74.23	71.88
Al_2O_3	15.29	12.60	19.15	13.23	23.56
Fe_2O_3	0.11		trace	0.84	0.14
FeO		trace		2.65	trace
MgO		trace	0.17	1.02	0.21
CaO		0.60	0.55	1.13	0.06
Na_2O	0.40	) 2.65	0.16	2.78	0.36
K_2O	0.50		0.10	2.66	0.43
H_2O+	) 2.40		) 4.30	0.81	) 3.24
H_2O-				0.08	
TiO_2				0.58	
P_2O_5					
MnO				0.07	
CO_2				0.08	
SO_3	trace				trace
SrO				trace	
Loss on ignition		2.10			
Total	100.64	98.60	100.69	100.16	99.88
Sp. gr.	2.76		2.77	2.72	2.91

Vitreous, lightened in colour and exceedingly hard where intensely metamorphosed for a distance of 60 feet from contact of the sill. The clastic structure has been destroyed by recrystallization of poikilitic or micrographic intergrowth of quartz and feldspar and abundant biotite and less muscovite. Epidote and zoisite cloud the feldspars. Magnetite, anatase, and apatite are rare.

R.A. Daly (1912, p. 242)

406. QUARTZ PYROPHYLLITE ROCK. Associated with quartz alunite rock occurring with dacite and andesite of the Vancouver volcanics and formed by the metasomatic replacement of fragmental dacite near an intrusive quartz diorite. Quarry of San Juan Mining and Manufacturing Company, Deetrail Claim on a peninsula in the northwestern part of Kyuquot Sound, between Kokshittle Arm and Easy Creek, Vancouver Island, B.C.

92–L–W½ (Anal. N.L. Turner) Ser. No. *1913–58*

White to greyish quartz-pyrophyllite rock forming compact masses which may contain small amounts of alunite, but usually the masses are pure. Dense, but with pronounced greasy feel, easily crushed to a smooth very fine powder and free of pyrite. Minerals are essentially quartz, pyrophyllite, accessory sericite, and small amounts of pyrite, limonite, and kaolin, small regularly shaped patches pseudomorphs after pyrite. Small amounts of unreplaced or secondary feldspar. Fine grained and some of the quartz is microphanitic.

C.H. Clapp (1914b, p. 118) *See also* Nos. 252, 401, 402, 409, 414 *(1913–55 to 57, 60, 59)*

407. ALBITIZED ARGILLITE BRECCIA. Derived from Tazin argillite, ½ mile north of Beaverlodge Lake, ½ mile east of Melville Lake, Martin Lake map-area, Sask.

74–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–10*

Brecciated black argillite has been reddened by the growth of secondary hematite-stained feldspar. Traces of the original bedding lamellae have been observed. It consists of fragments of argillite cemented by well-twinned albite, carbonate, and chlorite, and is also penetrated by similar material until the rock has become quite uniform in appearance.

K.R. Dawson (1951, p. 53)

408. ALTERED GREYWACKE. Six inch dyke-like alteration adjacent to No. 2 and No. 3 veins, Burwash Prospect, District of Mackenzie.

85–J–E½ (Anal. J.A. Maxwell) Ser. No. *1955–9*

Contains quartz, albite, muscovite, pyrite, and arsenopyrite.

R.W. Boyle (1961, p. 127)

409. **QUARTZ ALUNITE ROCK.** Formed by the metasomatic replacement of fragmental dacite of the Vancouver volcanics near an intrusive quartz diorite; Morris claim, on the tip of the peninsula in the northwestern part of Kyuquot Sound, between Kokshittle Arm and Easy Creek, Vancouver Island, B.C.

92–L–W½ (Anal. N.L. Turner) Ser. No. *1913–60*

Bluish grey, extremely fine grained, dense rock forming a large mass of almost 4½ acres. In places it is porcelain-like, possessing a hackly fracture and a harsh to hard, finely gritty feel. Some foliation. Colour varies from light to dark bluish grey, with pyrite as minute disseminated grains or finely granular masses, through reddish and pinkish to white, almost free from pyrite. It consists essentially of quartz and alunite occurring in irregular but roughly equidimensional grains, with accessory well-defined, lath-shaped to acicular grains of diaspore and sericite, and

	407	408	409	410	411
SiO_2	65.76	64.48	62.70	62.60	55.10
Al_2O_3	12.84	16.22	12.68	12.30	17.65
Fe_2O_3	1.10	0.84	1.40	9,40	4.54
FeO	3.09	4.95	trace		6.02
MgO	2.62	3.09	0.05	0.72	1.92
CaO	3.20	0.50	0.20	14.10	0.40
Na_2O	3.70	3.69	1.09		1.09
K_2O	0.54	2.12	2.10	0.43	4.39
H_2O+	1.67	2.77	7.15		2.40
H_2O-	0.11	0.15			0.09
TiO_2	0.31	0.66			0.66
P_2O_5	0.05	0.14			nil
MnO	0.04	0.04			nil
CO_2	4.12	nil			2.30
S	0.08	0.20	2.88		1.85
SO_3			7.06		0.45
Cl		0.02			
C	0.40	0.10			1.52
Cr_2O_3		0.03			
FeS_2			2.69		
As					nil
Loss on ignition				0.16	
Total	99.63	100.02	100.00	99.71	100.38
Less O≡S	0.03	0.09			0.69
	99.60	99.93			99.69
Sp.gr.	2.66	2.733	2.84	3.04–3.09	2.84

pyrite in small grains having regular crystal outlines and appearing to have replaced the alunitized rock. Other minerals present are kaolin, sulphur, and limonite, probably the result of surface alteration. (M)

C.H. Clapp (1914b, p. 118) *See also* Nos. 252, 401, 402, 406, 414 *(1913–55 to 59)*

410. EPIDOTE ROCK. Forming large beds among chloritic schists, Grand Matane River, Gaspé Bay, Que.

22–B–W½ (Anal. T.S. Hunt) Ser. No. *1858–8*

Rock is made up entirely of quartz and epidote; compact, very tough, and pale olive-green or pea-green.

T.S. Hunt (1859, p. 195)

411. SHEARED TUFF. From the "graphite fault" shear zone, Canadian Associated Goldfields Mine, 1,000-foot level, near Mine Station 1010, Claim T.C. 699, southern part of McVittie tp., Timiskaming district, Ont.

32–D–W½ (Anal. E.A. Thompson) Ser. No. *1927–21*

Most schistose material present along the shear zone consisting of post-card-thin chips from slickensided faces of the shear zone. The fault converts rocks over widths of several feet into fissile schist and lies within black tuffs. It is too obscured by graphite for identification of the minerals. Specimen shows a maximum of shearing and is one of the series taken to show the gradation from unsheared to sheared material.

H.C. Cooke (1927, p. 24) *See also* Nos. 260, 266–269, 323, 325, 411, 421 *(1927–16 to 25)*

412. ALTERED SYENITE APLITE. Gold King Claim, Hearst tp., Nipissing district, Ont.

32–D–W½ (Anal. M.F. Connor) Ser. No. *1914–4*

A syenite aplite containing over 68% albite with a few scattered flakes of biotite, some rhombohedral grains of carbonate, and here and there granular aggregates of magnetite.

M.E. Wilson (1913, p. 116)

413. GREENSTONE. Near the Copper Mine in Acton, Bagot co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1863–9*

Consists of fine grains of greenish white feldspar mingled with a blackish green amorphous mineral.

Geological Survey (1863, p. 604)

	412	413	414	415	416
SiO_2	52.88	49.45	48.82	48.28	47.60
Al_2O_3	16.29	14.80	19.08	21.34	16.50
Fe_2O_3	2.58		0.07	4.18	0.76
FeO	3.08	9.90		4.75	4.11
MgO	3.31	8.85		5.82	4.24
CaO	5.46	11.10		7.69	6.44
Na_2O	8.11	2.96	2.74	2.39	1.90
K_2O	0.87	1.15	4.40	0.36	3.74
H_2O+	0.06	) 2.60	) 7.00	) 2.56	3.82
H_2O-	0.44				0.18
TiO_2	0.31			1.63	0.50
P_2O_5					0.04
MnO					0.04
CO_2	7.72				10.75
S			0.57	nil	0.17
SO_3			17.32	1.05	
Total	101.11	100.81	100.00	100.05	100.79
Less O≡ S			0.21		0.06
			99.79		100.73
Sp.gr.	2.78	3.04–3.07	2.75	1.330	2.790

414. QUARTZ ALUNITE ROCK. Formed by the metasomatic replacement of fragmental dacite of the Vancouver volcanics near an intrusive quartz diorite; Morris claim, on the tip of a peninsula in the northwestern part of Kyuquot Sound, between Kokshittle Arm and Easy Creek, Vancouver Island, B.C.

92–L–W½ (Anal. N.L. Turner) Ser. No. *1913–59*

Pink to white quartz alunite rock, extremely fine grained, dense, in places porcelain-like, possessing a hackly fracture and a harsh to hard, finely gritty feel. Some foliation. The colour varies from a light to dark bluish grey for samples containing pyrite, through reddish and pinkish to white for those almost free from pyrite. It consists essentially of quartz and alunite, with accessory diaspore and sericite. Other minerals are kaolin, sulphur, and limonite, probably the result of recent surface alteration. Some secondary feldspar was found. The alunite was fine grained, occurring in irregular but roughly equidimensional grains, varying from 0.005 to 0.3 mm in diameter. Quartz varies from 0.005 to submicroscopic size. Diaspore occurs in well-defined, lath-shaped to acicular grains. (M)

C.H. Clapp (1914b, p. 118) *See also* Nos. 252, 401, 402, 406, 409 *(1913–55 to 58, 60)*

415. ALTERED DIABASE. From the dyke that had lain in Boyer Lake, Helen mine area, Michipicoten district, Lake Superior, Ont.

42–C–E½ (Anal. W.F. James) Ser. No. *1926–11*

Weathered specimen, about 1/16 inch thick, off the surface of diabase showing diabase textures distinctly, and stained yellowish brown with iron hydrate.

W.H. Collin, T.T. Quirke, J.E. Thomson (1926, p. 133)
See also Nos. 163, 420 *(1926–12, 11)*

416. MINERALIZED AUGITE DIORITE. Near King Vein, at the Lorne Mine, Bridge River between Rexmount and Gun Lake, Lillooet district, B.C.

92–J–E½ (Anal. M.F. Connor) Ser. No. *1922–2*

Light grey country rock associated with gold-bearing quartz veins which, for a distance varying from a few inches to 8 feet from the veins, is progressively altered by the action of hydrothermal solutions. It is leached of ferromagnesian minerals and in places impregnated with sulphides. The augite, hornblende, and feldspar have been replaced by a finely felted aggregate of sericite, quartz, and ferrodolomite. Quartz shows incipient alteration and strain shadows.

W.S. McCann (1922, p. 63) *See also* No. 159 *(1922–1)*

417. ALTERED SYENITE APLITE. Harris Maxwell Claim, Hearst tp., Nipissing district, Ont.

32–D–W½ (Anal. M.F. Connor) Ser. No. *1914–5*

Siliceous, impure, iron magnesian lime carbonate rock, generally containing an abundance of chromiferous mica giving it a bright green colour, and traversed by innumerable anastomosing and intersecting quartz veinlets. It consists of carbonate with varying proportions of pyrite, chrome mica, sericite, feldspars, and quartz. Galena and rutile occur in some sections. In general a considerable part of the rock consists of impurities and not more than 50% is carbonate.

M.E. Wilson (1913, p. 116)

418. MAGNESITE. Band of rock over 1,000 feet wide lying between mixed dunite and serpentine, along the shore of Atlin Lake, near the mouth of Pine Creek, Atlin mining district, B.C.

104–N–W½ (Anal. G.C. Hoffmann) Ser. No. *1899–30*

Brown-weathering rock, containing numerous quartz veins and stringers of small size. It is more or less impregnated with gold-bearing pyrite.

J.C. Gwillim (1901, p. 21)

419. GARNET ROCK. A bed in contact with serpentine at the falls of the River Guillaume, St. Francis, Beauce co., Que.

21–L–W½ (Anal. T.S. Hunt) Ser. No. *1856–12*

An exceedingly tough, homogeneous, yellowish white rock with sub-conchoidal fracture and traces of crystallization, having a shining, somewhat silky, lustre.

T.S. Hunt (1857c, p. 449)

420. ALTERED DIABASE. From the dyke that had lain in Boyer Lake, Michipicoten district, east side of Lake Superior, Ont.

42–C–E½ (Anal. W.F. James) Ser. No. *1926–11*

Reddish veins of kaolin in which the original diabase texture is well preserved. Texture shows distinctly and is stained yellowish brown with iron hydrate.

W.H. Collins, T.T. Quirke, J.E. Thomson (1926, p. 133)

See also Nos. 163, 415 *(1926–12, 11)*

	417	418	419	420	421
SiO_2	45.92	45.68	44.85	44.34	43.35
Al_2O_3	9.38		10.76	30.54	7.59
Fe_2O_3	0.50		3.20	11.23	0.58
FeO	5.71	5.10		0.31	9.90
MgO	7.98	21.70	5.24	trace	23.97
CaO	6.78		34.38	trace	3.90
Na_2O	3.58			0.30	trace
K_2O	2.22			0.60	trace
H_2O+	) 2.20	) 0.52[1]		11.37	7.20
H_2O-				0.32	0.20
TiO_2	0.27			1.42	trace
P_2O_5					nil
MnO					nil
CO_2	15.94				3.40
S				nil	0.14
SO_3				0.32	nil
C					0.14
H_2CO_3		27.00			
As					nil
Loss on ignition			1.10		
Total	100.48	100.00	99.53	100.75	100.37
Less O≡ S					0.05
					100.32
Sp.gr.			3.333	1.330	

[1] Including loss on ignition

421. SHEARED GREENSTONE. 1,000-foot level, near Mine Station 1016, of the Canadian Associated Goldfields Mine, where a branch of a "graphite fault" cuts greenstones, Claim T.C. 699, southern part of McVittie tp., Timiskaming district, Ont.

32–D–W½ (Anal. E.A. Thompson) Ser. No. *1927–24*

From the slickensided faces of the shear zone showing maximum development of schist-making minerals. This is one of the series taken to show the gradations from unsheared to sheared material.

H.C. Cooke (1927, p. 24) *See also* Nos. 260, 266–269, 323, 325, 411, 421 *(1927–16 to 24)*

422. TALC CHLORITE ALTERATION ROCK. Diamond Drill Core 174, Astoria Property, from the Cadillac Larder Lake fault, lot 16, rge. 4, Rouyn tp., Timiskaming co., Que.

32–D–W½ (Anal. R.J.C. Fabry) Ser. No. *1945–3*

(M.E. Wilson)

423. METAMORPHOSED VOLCANIC. Iron Mask Mineral Claim, Mill Hill, Esquimalt district, Vancouver Island, B.C.

92–B–W½ (Anal. M.F. Connor) Ser. No. *1913–29*

Massive, fine-grained, light reddish brown to light green rock consisting of andradite, garnet, diopside, and epidote, with quartz, calcite and epidote veinlets, and mineralized to a greater or lesser extent with pyrite, chalcopyrite, and magnetite. Garnet with quartz and epidote sometimes occurs as veinlets in the diopside and diopside grains are occasionally included in the garnet. Later veinlets of calcite cut all the other minerals. (M)

C.H. Clapp (1913, p. 37)

424. CHLORITE TREMOLITE ROCK. Taken 3 inches from the contact between greenstone and serpentine on the greenstone side of the contact 250 yards upstream from the upper bridge over Pine Creek, leading to Spruce Creek, on the north bank, Atlin Lake, Cassiar district, B.C.

104–N–W½ (Anal. R.J.C. Fabry) Ser. No. *1953–10*

Dark green, schistose, chloritic rock consisting chiefly of a mass of faintly green chlorite and containing 40% tremolite in ragged clumps. Leucoxene and magnetite make up about 1% of the rock.

(J.D. Aitken) *See also* Nos. 384, 386 *(1953–11, 9)*

425. CARBONATE ALTERATION ROCK. Diamond Drill Core No. S 66, Durbar property, Cadillac Larder Lake fault, lot 61, rge. 4, Beauchastel tp., Timiskaming co., Que.

32–D–W½ (Anal. R.J.C. Fabry) Ser. No. *1945–2*

Alteration along the Cadillac Larder Lake fault consists of gold-bearing carbonate and granular quartz, talc-chlorite schist, and, at the base, graphitic greywacke schist.

(M.E. Wilson)

426. ALTERED SEDIMENT. From a belt of sediments outcropping on a bluff on the Madge claim about 700 feet northwest of the Gisby adit, Gisby Group, west side of the Fraser River, 3 miles below Keefers and 2 miles above Chaumox Station, Yale district, B.C.

92–H–W½ (Anal. M.F. Connor) Ser. No. *1926–16*

A moderately coarse, calcareous sediment, composed chiefly of a carbonate, quartz, and an isotropic mineral resembling garnet but largely altered to greenish chlorite.

M.E. Wilson (1926, p. 48)

	422	423	424	425	426 insol. (a)
SiO_2	43.16	42.86	31.47	27.55	32.00
Al_2O_3	8.18	7.19	17.35	6.44	27.12[1]
Fe_2O_3	3.76	14.24	3.58	1.43	
FeO	6.56	4.28	10.90	7.27	
MgO	27.46	2.96	22.65	16.80	7.61
CaO	5.00	26.30	3.59	10.45	1.94
Na_2O	0.47	0.27	0.03	1.87	
K_2O	trace	0.33		0.93	
H_2O+	2.48	1.00	6.77	2.58	
H_2O-	0.08		0.25	0.10	
TiO_2	0.35	0.30	2.10	0.35	
P_2O_5	trace	0.21	0.23	0.11	
MnO	trace	0.50	0.04	0.40	
CO_2	2.12		0.55	23.66	
S	0.09		0.28	0.93	
Cr_2O_3	0.02			0.03	0.12
NiO	0.06			trace	
loss on ignition					3.34
soluble portion					29.00
Total	99.79	100.44	99.79	100.90	101.13[2]
Less O≡ S	0.03		0.10	0.35	
	99.76		99.69	100.55	
Sp.gr.		3.44			

[1] In about equal proportion

[2] Total according to actual percentage figures. The specimen was composed 27.66% soluble and 72.34% insoluble portions: the analysis gives the approximate composition of these two parts.

427. SERPENTINE. Near a bed of chromic iron, Ham tp., Wolfe co., Que.

21–E–W½ (Anal. T.S. Hunt) Ser. No. *1851–8*

Massive, greenish white, translucent rock.

T.S. Hunt (1852b, p. 99)

428. "PRECIOUS" SERPENTINE. Megantic Mine, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. R.P.D. Graham?) Ser. No. *1918–23*

Translucent, massive serpentine, with a waxy or greasy lustre and chrysoprase-green colour. Small veins of chromite are scattered through some specimens. The serpentine in the vicinity of these chromite grains sometimes includes small patches or narrow veinlets of a deep lilac-coloured mineral identified as stitchtite.

E. Poitevin and R.P.D. Graham (1918, p. 76)

429. SERPENTINE. Location not known.

(Anal. M.F. Connor) Ser. No. *1921–30*

(R. Harvie)

430. SERPENTINE. Forming the margin of a vein of asbestos, Vimy Mine, Thetford district, Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1932–22*

A blackish rock without visible grain. This particular margin is about 2½ inches wide and is 3.3 times the width of the vein. The alteration is clearly caused by the vein-forming solutions and it is succeeded by normal rock. It is composed almost entirely of serpentine of which about half is bastite, the rest antigorite. About 1% of secondary magnetite is present, with a few grains of picotite and hydromagnesite.

H.C. Cooke (1937, p. 113)

431. SERPENTINE. Blackened material near the injection of a granite dyke in a pit near Caribou Lake, NW corner of lot 19 NW., rge. 10, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1935–16*

The blackened zone is approximately 1-foot wide, similar to the width of the dyke itself. It is clouded with dark particles and there are many large particles of magnetite. It is intersected by numerous fine, parallel veinlets that weather white and prove to be clear antigorite, each with a central veinlet of clear serpentine.

H.C. Cooke (1937, p. 83) *See also* No. 445 *(1934–21)*

	427	428	429	430	431
SiO_2	43.40	43.31	41.46	40.72	40.42
Al_2O_3	} 3.60	0.38	1.42	1.01	2.24
Fe_2O_3		0.27	0.68	4.07	2.11
FeO		nil	1.67	0.63	4.26
MgO	40.00	40.03	40.12	39.30	39.44
CaO		0.12	trace	0.32	0.29
Na_2O		) 0.28		0.09	
K_2O				nil	
H_2O+	) 13.00	) 15.77	13.57	13.41	11.11
H_2O-			0.45	0.43	0.10
TiO_2			nil	nil	
P_2O_5				nil	
MnO		trace	0.09		
CO_2				nil	nil
S				0.10	
Cr_2O_3			0.20	0.42	
NiO			0.18	0.30	
Total	100.00	100.16	99.84	100.80	99.97
Less O≡ S				0.04	
				100.76	
Sp. gr.	2.546	2.51		2.57	

432. OPHIOLITE. Lot 10, rge. 18, Orford tp., Sherbrooke co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1856–27*

Finely granular, olive-green, massive serpentine, enclosing grains of magnetic and chromic iron ores.

T.S. Hunt (1857c, p. 434)

433. SERPENTINE. Location unknown.

(Anal. M.F. Connor) Ser. No. *1921–31*

(R. Harvie)

434. SERPENTINE. Occurs as bands or zones along the joint planes, fissures or cracks of peridotite near Black Lake Station, Ireland tp., Megantic co., Que.

21–L–W½ (Anal. M.F. Connor) Ser. No. *1913–3*

Dark, olive-green rock, which weathers to a cream colour. It shows no crystalline structure but contains occasional crystals of pyroxene and grains of iron oxide. It is frequently fractured and slickensided. Remnants of olivine are rarely found, although outlines of olivine crystals altered to serpentine can more frequently be seen. Minute veins of asbestos are found, which frequently run in courses that suggest the characteristic lines of parting along which serpentinization is often seen to begin in partly altered crystals of olivine in peridotite.

J.A. Dresser (1913, p. 29)

435. **SERPENTINITE.** Forms the host rock for the chrysotile asbestos, Cassiar Asbestos Corporation Property, Cassiar, B.C.

104–P–W½ (Anal. J.A. Maxwell) Ser. No. *1954–39*

Apple-green, waxy-looking serpentine with bladed aggregate structure. It is length-slow with low birefringence and parallel extinction.

(H. Gabrielse) *See also* Nos. 296, 436, 437, 1063, 1069 *(1955–5; 1954–22, 20, 40; 1955–1)*

436. **SERPENTINITE.** Part of the large serpentinized ultramafic body outcropping in a stream gully 1.6 miles due west of lat. 59°30'60", long. 129°45' 00", Cassiar district, B.C.

104–P–W½ (Anal. J.A. Maxwell) Ser. No. *1954–22*

Highly sheared and slickensided serpentinite. It is dark green to black with occasional flashing pseudomorphs of serpentine after pyroxene. It consists of bladed serpentine showing well-developed, reticulate texture and contains considerable magnetite.

(H. Gabrielse) *See also* Nos. 296, 435, 437, 1063, 1069 *(1955–5; 1954–39. 20, 40; 1955–1)*

	432	433	434	435	436
SiO_2	40.30	40.16	40.08	39.73	39.72
Al_2O_3		0.72	2.11	1.35	1.49
Fe_2O_3		2.00	1.13	4.26	5.30
FeO	7.02	4.68	1.70	0.98	2.87
MgO	39.07	41.76	37.90	39.54	36.91
CaO		trace	0.20	nil	0.14
Na_2O			0.10	nil	nil
K_2O				nil	nil
H_2O+	13.35	9.50	13.89	12.41	11.76
H_2O-		0.45	1.35	0.95	0.74
TiO_2		nil	nil	nil	0.01
P_2O_5				nil	nil
MnO		0.09		0.08	0.10
CO_2				0.18	0.07
Cr_2O_3	trace	0.20		0.36	0.29
NiO	0.26	0.25		0.27	0.26
Total	100.00	99.81	98.46	100.11	99.66
Sp.gr.	2.597				

437. SERPENTINITE. Taken from the serpentinite that is in contact with volcanic rocks (i.e., the hanging-wall) at the Cassiar Asbestos Corporation Property, Cassiar, B.C.

104–P–W½ (Anal. J.A. Maxwell) Ser. No. *1954–20*

Dark green, fine-grained, homogeneous serpentinite with conchoidal fracture, grading into normal, lighter green, asbestos-bearing serpentinite and diffusing into greenstone of the hanging-wall. It consists of a bladed aggregate of low-birefringent, length-slow, mineral showing a reticulate texture and parallel extinction.

(H. Gabrielse) *See also* Nos. 296, 435, 436, 1063, 1069 *(1955–5; 1954–39, 22, 40; 1955–1)*

438. SERPENTINE. An intrusive belt about 200 feet wide lying between argillaceous sediments to the north and cherty and argillaceous sediments to the south. About 2,800 feet above and 10,000 feet S30°E of Pioneer Mine, on the summit of a ridge between Camp and Crazy Creeks, B.C.

92–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1935–22*

A dark green, dense serpentine with conspicuous, lustrous phenocrysts of pyroxene and composed mainly of mesh antigorite through which are scattered a number of bastite phenocrysts after enstatite; a considerable amount of magnetite, some brown spinel, and a small amount of carbonate are also present.

C.E. Cairnes (1937, p. 29) *See also* Nos. 180, 215, 442, 488 *(1935–24, 23, 21, 25)*

439. SERPENTINE. Island in Lake Abitibi, Que.

32–D–W½ (Anal. B.J. Harrington) Ser. No. *1872–14*

A dark green rather soft rock with splintery fracture and resinous lustre and weathering a dull white. It is strongly magnetic and contains grains of chromic iron.

B.J. Harrington (1873b, p. 300)

440. SERPENTINE. Occurs as bands or zones along the joint planes, fissures or cracks of peridotite. Garthby, lot 40, rge. 2, Wolfe co., Que.

21–E–W½ (Anal. M.F. Connor) Ser. No. *1913–9*

A dark, olive-green rock often weathering to a cream colour. Shows no crystalline structure but contains occasional crystals of pyroxene and grains of iron ore. It is frequently fractured and slickensided. Remnants of olivine are rarely found though outlines of olivine crystals altered to serpentine can more frequently be seen. Minute veins of asbestos are found frequently running in courses that suggest characteristic lines of parting along which serpentinization is often seen to begin in partially altered crystals of olivine in peridotite.

J.A. Dresser (1913, p. 29)

441. SERPENTINE. Calumet Island, Pontiac co., Que.

31–F–E½ (Anal. T.S. Hunt) Ser. No. *1856–29*

A pale, greenish grey opaque and earthy rock containing a mixture of argillaceous matter.

T.S. Hunt (1857c, p. 482)

	437	438	439	440	441
SiO_2	39.41	38.61	38.48	37.66	37.50
Al_2O_3	4.68	2.14	4.15	1.61	
Fe_2O_3	2.38	7.80		6.15	9.00
FeO	3.98	1.58	9.24	1.87	
MgO	35.52	38.61	35.73	38.66	37.58
CaO	0.14	0.22		0.22	
Na_2O	nil			0.20	
K_2O	nil				
H_2O+	12.03	8.71		12.49	15.00
H_2O-	1.07	0.72		0.75	
TiO_2	0.39	nil		trace	
P_2O_5	0.13				
MnO	0.27	0.10			
CO_2	0.06	nil			
S		0.04			
Cr_2O_3	0.01	0.38			
NiO	0.07	0.17	0.28		
chromic Fe[1]			0.51		
Loss on ignition			11.60		
Total	100.14	99.08	99.99	99.61	99.08
Less O≡S		0.01			
		99.07			
Sp. gr.			2.77		

[1] Chromite ?

442. SERPENTINE. Joins a narrow, probably lens-shaped mass, in contact with a narrow body of dioritic intrusive along its northerly flank, with cherty and argillaceous sediments to the south; the serpentine intrudes the sediments, but is presumably genetically related to the diorite. A

composite sample was taken across the exposed width of the lens (200 feet), on the right bank of Cadwallader Creek below the Pioneer Mine, mill and just above the main road to Pioneer Mine, Bridge River mining camp, B.C.

92–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1935–21*

Dark green, dense rock, composed mainly of colourless, bladed antigorite with numerous small areas of crystalline carbonate, probably magnesite; abundant, disseminated magnetite, at least partly secondary and outlining boundaries of original crystals. There seems to be band-like areas of slightly yellowish serpentine of a texture different to that of the bladed antigorite.

C.E. Cairnes (1937, p. 29) *See also* Nos. 180, 215, 438, 488 *(1935–24, 23, 22, 25)*

443. SERPENTINE. Locality not known.

(Anal. M.F. Connor) Ser. No. *1921–29*

(R. Harvie)

444. SERPENTINITE. Central zone of northeast limb of the serpentinite anticline east of McNeill Lake, Que.

23–P–W½ (Anal. R.J.C. Fabry) Ser. No. *1951–21*

A dense, hard, black rock consisting of olivine "forms" averaging 0.7 mm in diameter composed of serpentine (chrysotile and antigorite) in a groundmass of pyroxene (diopsidic augite), magnetite, chlorite, tremolite, and serpentine.

(W.F. Fahrig) *See also* Nos. 214, 385, 387, 389, 393 *(1951–20, 22, 19, 24, 23)*

445. SERPENTINE. Pit near Caribou Lake, in the northwest corner of lot 19, rge. 10, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1934–21*

A normal, red-weathering serpentine cut by granite dykes which cause blackening of the serpentine for some distance from them. It consists of clear serpentine, faintly clouded by very minute dark particles and a few large chromite grains.

H.C. Cooke (1937, p. 83) *See also* No. 431 *(1935–16)*

	442	443	444	445
SiO_2	37.23	35.28	34.78	34.40
Al_2O_3	0.66	1.41	6.60	0.50
Fe_2O_3	7.36	6.93	13.33	0.82
FeO	2.03	4.78	5.62	3.79
MgO	38.37	37.91	27.19	42.36
CaO	0.30	trace	2.58	0.02
Na_2O	nil		0.37	
K_2O	nil		0.10	
H_2O+	9.50	12.96	7.01	15.17
H_2O-	0.18	0.41	0.12	0.47
TiO_2	nil	0.08	0.21	nil
P_2O_5			0.05	
MnO	0.08	0.08	1.23	0.94
CO_2	2.96		0.10	0.38
S	0.21		0.10	nil
Cr_2O_3	0.39	0.25	0.05	0.48
NiO	0.13	0.10	0.80	0.35
Total	99.40	100.19	100.24	99.68
Less O≡ S	0.08		0.04	
	99.32		100.20	

PARTIAL ANALYSES OF METAMORPHIC ROCKS

446. SERICITE SCHIST. Interbedded with albitite near the St. Louis fault; 200 feet east of Ace Lake shaft, Goldfields, Sask.

74–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1952–5*

A highly schistose rock consisting of coarse to fine, sinuous books of muscovite in a granular matrix of quartz and feldspar and veined by albite and calcite. Chlorite, apatite, pyrite, and red hematite are also present. SiO_2 56.32%, Fe_2O_3 6.68%, MgO 2.41%, CaO 2.41%, Na_2O 4.50%, K_2O 1.02%, Sp. gr. 2.307.

(K.R. Dawson)

447. SERICITE SCHIST. Constitutes extensive rock masses at Wait-a-bit Creek, which flows into the Columbia River, about 2 miles north of Donald, East Kootenay district, B.C.

82–N–W½ (Anal. R.A.A. Johnston) Ser. No. *1892–49*

The schist has a foliated structure, a light brownish grey to light reddish brown colour, a faintly glistening lustre, and is intersected by quartz veins. Analysis was made of the part soluble in dilute HCl (38.36%). SiO_2 0.96%, Fe_2O_3 13.66%, FeO 5.43%, MgO 5.84%, CaO 31.12%, H_2O+ 2.64%, H_2O- 1.80%, H_2CO_3 35.41%, Cl 0.10%, H_2SO_4 0.10%, H_3PO_4 0.10%, Na_2O 2.79%, K_2O 0.05%.

G.C. Hoffmann (1895, p. 21)

448. GRAPHITE TREMOLITE TALC-DOLOMITE SCHIST. Associated with dolomite and dykes of granite intrusive into it, and flat-bedded sandy limestone. Pits No. 4 and 5, Eldorado deposit, on the south of lot 20, con. 5, Madoc tp., Hastings co., Ont.

31–C–W½ (Anal. M.F. Connor) Ser. No. *1926–14*

Dark grey, much deformed graphitic schist exhibiting large flakes of talc here and there on its cleavage faces. It consists of numerous parallel, rod-like crystals of tremolite and grains of dolomite and quartz, elongated parallel to the foliation of the schist, with large flakes of talc, fine specks of graphite distributed in aggregates and zones, and a few scattered cubes of pyrite.

Al_2O_3 + Fe_2O_3 1.90%, $MgCO_3$ 19.98%, $CaCO_3$ 17.34%, H_2O+ 2.15%, H_2O- 0.30%, insol. 58.50%. Total = 100.17%. The insoluble portion consisted of: SiO_2 69.96%, Al_2O_3 + Fe_2O_3 3.90%, CaO 2.00%, MgO 16.39%, alkalies 4.18%, H_2O+ 3.57%; total = 100.00%.

M.E. Wilson (1926, p. 72) *See also* No. 449 (*1926–15*)

449. TALC-DOLOMITE SCHIST. Associated with dolomite, limestone-dolomite and limestone (Grenville-Hastings Series), dykes of granite intrusive into them, and flat-bedded sandy limestone. No. 1 pit, Eldorado property, lot 20, con. 5, Madoc tp., Hastings co., Ont.

31–C–W½ (Anal. M.F. Connor) Ser. No. *1926–15*

Generally a fine-grained, cream-white, snow-white to pale grey schist, which differs from the ordinary dolomite chiefly in its highly foliated character, and in a greater abundance of glistening flakes of talc. It consists of granular dolomite, a few scattered grains of quartz, and orthoclase, and zones of micaceous talc, which though usually occurring in large, clear flakes up to a millimeter and more in diameter, in some sections were deformed and converted into minute folia. Soluble portion consisted of: Al_2O_3 + Fe_2O_3 0.65%, $CaCO_3$ 34.93%, $MgCO_3$ 33.00%, H_2O+ 1.28%, H_2O- 0.10%, insol. 30.50%, total = 100.46%. The insoluble portion consisted of: SiO_2 68.51%, Al_2O_3 + Fe_2O_3 2.07%, MgO 23.31%, CaO 0.47%, Na_2O + K_2O 1.57%, H_2O 4.05%, total = 100.00%.

M.E. Wilson (1926, p. 72) *See also* No. 448 (*1926–14*)

450. GREENSTONES. Traverse across metamorphic facies, Yellowknife greenstone belt, Yellowknife, District of Mackenzie.

85–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1954–51*

H_2O	CO_2	S
3.30	0.82	0.12
3.87	5.48	0.07
3.06	2.10	0.05
4.70	7.47	0.17
2.85	1.57	0.06
2.96	3.93	0.04
1.04	2.39	0.15
4.41	5.15	0.19
4.41	6.74	0.08
1.12	0.31	0.47
1.03	0.72	0.31
0.73	0.13	0.20
1.39	1.06	0.16
2.00	0.61	0.14

(R.W. Boyle)

451. **SERICITE SCHIST.** Sutton Series, Memphremagog Area, Stanstead co., Que.

31–H–E½ (Anal. R.J.C. Fabry) Ser. No. *1932–20*

From the non-albitized part of the series of mica-chlorite schists and gneisses, which are, for the most part, albitized.
Na_2O 1.72%, K_2O 2.89%.

(H.W. Fairbairn)

452. **CHLORITIZED GREENSTONE.** First level, 100 feet, Giant shear zone system, Giant mine, Yellowknife, District of Mackenzie.

85–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1953–27*

SiO_2 42.74%.

(R.W. Boyle)

453. **EPIDOTE AMPHIBOLITE.** Interbedded with argillite, 100 feet east of the Ace Lake shaft, Goldfields, Sask.

74–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1952–6*

Fine-grained, fresh, foliated amphibolite consisting largely of epidote and hornblende, veined by quartz and calcite. Considerable plagioclase, small amount of quartz, and rare sphene were also present. (M)
SiO_2 49.99%, Fe_2O_3 12.60%, MgO 5.24%, CaO 11.57%, Na_2O 2.64%, K_2O 0.16%. Sp. gr. 3.114.

(K.R. Dawson)

454. **AMPHIBOLITES.** Samples taken across the metamorphic facies, Yellowknife greenstone belt, District of Mackenzie.

85–J–E½ (Anal. J.A. Maxwell) Ser. No. *1954–24*

H_2O (total)	CO_2	S (total)
2.04	.41	.13
2.21	.05	.14
2.52	.16	.11
2.12	.22	.15
2.55	.84	.32
3.12	.41	.05
3.60	3.29	.11
4.54	9.09	.06
3.62	.08	.03
4.04	2.28	.02
3.97	1.28	.00
4.90	4.42	.00

(R.W. Boyle)

455. **AMPHIBOLITE.** Dark amphibolite with indefinite contacts in greenstone rocks; Yellowknife, District of Mackenzie.

85–J–E½ (Anal. J.A. Maxwell) Ser. No. *1955–14*

Total H_2O 1.64%, CO_2 0.11%, Cl 0.01%, S 0.19%, Cr_2O_3 0.02%.
Spectrographic analyses: Si, Al, 10–100%, Fe, Mg, Ca, Na, K, 1–10%, Ti, 1000–10,000 ppm; Sr, Ba, Mn, V, Li, Rb, 100–1000 ppm; Zr, Ni, Cr, Co, Cu, 10–100 ppm. Sp. gr. 3.002.

(R.W. Boyle)

456. **GRANITE GNEISS.** Kaminis granite in an isolated mass intrusive into rocks of the upper Missi Series and into the Amisk Group; from the shore of the Long Bay of Athapapusko Lake into which the Mistik Lakes empty, Sask.

63–L–E½ (Anal. M.F. Connor) Ser. No. *1918–3*

A bright pink rock containing lenses and schlieren of hornblende schist, which are remnants of included bodies of sedimentary rocks. Where it intrudes the volcanic rocks the contact is a zone of shattered and metamorphosed rock. It consists of feldspar, quartz, hornblende, biotite, magnetite, kaolin, sericite, apatite, and zircon. Feldspar is about equally divided between orthoclase and acid plagioclase near oligoclase.
SiO_2 66.76%, Al_2O_3 15.39%, Fe_2O_3 1.27%, FeO 1.49%, MgO 1.50%, CaO 2.56%. Na_2O 4.47%, K_2O 3.35%, H_2O 0.60%, TiO_2 0.15%, total = 97.54%

E.L. Bruce (1918, p. 39)

457. **GNEISS.** Fishog Lake, near Minden, Ont.

31–D–E½ (Anal. J.A. Maxwell) Ser. No. *1954–30 and 31*

From the maximum point of the negative anomaly on the aeromagnetic map. The minerals present are quartz, plagioclase, potash feldspar, hornblende, biotite, apatite, zircon, and opaque minerals. Sample was crushed, sifted, panned in water, dried at 105° ± 5°C. Mineral separation was done using a hand magnet, Frantz separator and Clerici solution. The separates were cleaned with water and dried in air.
(a) Magnetic portion: Fe_2O_3 72.2%, FeO 25.9%, TiO_2 0.6%.
(b) Less magnetic portion: Fe_2O_3 62.5%, FeO 9.5%, TiO_2 8.3%.

(R. Mitra)

458. **GNEISS.** Fishog Lake, Minden, Ont.

31–D–E½ (Anal. J.A. Maxwell) Ser. No. *1954–25 and 32*

Description similar to that for No. 457. From the negative anomaly.
(a) Magnetic portion: Fe_2O_3 64.3%, FeO 27.6%, TiO_2 1.4%.
(b) Less magnetic portion: Fe_2O_3 20.2%, FeO 21.1%, TiO_2 27.7%.

(R. Mitra)

459. **GNEISS.** Fishog Lake, Minden, Ont.

31–D–E½ (Anal. J.A. Maxwell) Ser. Nos. *1954–28 and 29*

Description similar to that for No. 457. From the positive anomaly.
(a) Metal portion: Fe_2O_3 68.9%, FeO 21.2%, TiO_2 1.2%.

(b) Less magnetic portion: Fe_2O_3 47.2%.

(R. Mitra)

460. **GNEISS.** Fishog Lake, at the southwest end, Minden, Ont.

31–D–E½ (Anal. J.A. Maxwell) Ser. Nos. *1954–26 and 27*

Description similar to that for No. 457. From the highest point of the positive anomaly.
(a) Magnetic portion: Fe_2O_3 89.2%, FeO 4.6%, TiO_2 1.1%.
(b) Less magnetic portions: Fe_2O_3 81.0%, FeO 0.9%, TiO_2 7.5%.

(R. Mitra)

461. **METABASALT.** Athabaska Series, Goldfields-Martin Lake area, Sask.

74–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–26*

Na_2O 3.64%, K_2O 1.74%.

(A.M. Christie) *See also* No. 462 (*1951–27*)

462. **METABASALT.** Athabaska Series, from the shore of Beaverlodge Lake just over ½ mile southeast of the Martin Lake adit entrance, Goldfields-Martin Lake area, Sask.

74–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–27*

The feldspar, much altered to sericite, is a calcic oligoclase. The remainder of the specimen consists of chlorite, calcite, pyrite, magnetite, and hematite.
Na_2O 3.44%, K_2O 1.40%.

A.M. Christie (1953, p. 52) *See also* No. 461 (*1951–26*)

463. **METAGABBRO SILL.** Across interval 0–3 feet from a quartz lens, near Yellowknife townsite, greenstone belt, District of Mackenzie.

85–J–E½ (Anal. J.A. Maxwell) Ser. No. *1955–18*

SiO_2 49.28%, Sp. gr. 3.00.

R.W. Boyle (1961, p. 136) *See also* Nos. 464, 465 (*1955–19, 20*)

464. **METAGABBRO SILL.** Across interval 3–13 feet from a quartz lens, near Yellowknife townsite, greenstone belt, District of Mackenzie.

85–J–E½ (Anal. J.A. Maxwell) Ser. No. *1955–19*

SiO_2 49.84%. Sp. gr. 3.00.

R.W. Boyle (1961, p. 136) *See also* Nos. 463, 465 (*1955–18, 20*)

465. **METAGABBRO SILL.** Across interval 13–130 feet from a quartz lens, near the Yellowknife townsite, greenstone belt, District of Mackenzie.

85–J–E½ (Anal. J.A. Maxwell) Ser. No. *1955–20*

SiO_2 50.18%. Sp. gr. 3.04.

R.W. Boyle (1961, p. 136) *See also* Nos. 463, 464 (*1955–18, 19*)

466. **METAGABBRO SILL.** Across interval 0.3 feet from a quartz lens, near Yellowknife townsite, greenstone belt, District of Mackenzie.

85–J–E½ (Anal. J.A. Maxwell) Ser. No. *1955–23*

SiO_2 49.43%. Sp. gr. 3.02.

R.W. Boyle (1961, p. 136) *See also* Nos. 467, 468 (*1955–21, 22*)

467. **METAGABBRO SILL.** Across interval 3–13 feet from a quartz lens, near Yellowknife townsite, greenstone belt, District of Mackenzie.

85–J–E½ (Anal. J.A. Maxwell) Ser. No. *1955–21*

SiO_2 50.66%. Sp. gr. 3.03.

R.W. Boyle (1961, p. 136) *See also* Nos. 466, 468 (*1955–23, 22*)

468. **METAGABBRO SILL.** Approximately 13–120 feet from the quartz lens near Yellowknife townsite, greenstone belt, District of Mackenzie.

85–J–E½ (Anal. J.A. Maxwell) Ser. No. *1955–22*

SiO_2 50.76%. Sp. gr. 2.99.

R.W. Boyle (1961, p. 136) *See also* Nos. 466, 467 (*1955–23, 21*)

469. **ALTERED ARGILLITE.** Large inclusion of argillite in the Coast Range granodiorite batholith; just outside the mineralized area of orebody No. 1, Hidden Creek mine, Granby Bay, Observatory Inlet, B.C.

103–P–W½ (Anal. ?) Ser. No. *1913–52*

SiO_2 69.2%, Al_2O_3 9.8%, MgO 2.9%, CaO 3.6%, S 2.9%, Fe 5.5%.

R.G. McConnell (1914a p. 55) *See also* No. 473 (*1913–51*)

470. **SCHIST.** From a large inclusion of argillite and greenstone in Coast Range granodiorite batholith; occurring just outside the mineralized area of orebody No. 2, Hidden Creek mine, Granby Bay, Observation Inlet, B.C.

103–P–W½ (Anal. ?) Ser. No. *1913–54*

Green chloritic schist.

SiO_2 48.4%, Al_2O_3 18.1%, MgO 9.7%, CaO 4.9%, S 0.5%, Fe 9.0%.

R.G. McConnell (1914a, p. 55) *See also* No. 472 (*1913–53*)

471. **PROPYLITIZED MICRODIORITE.** Bordering the stock of microdiorite occurring in the hills on either side of Wrinch Canyon between George Lake and Cole Lake, south of Buckley River valley, B.C.

93–L–E½ (Anal. A.H. Phillips) Ser. No. *1929–16*

A light, greenish grey rock in which the original minerals are almost completely replaced by ankerite, penninite, chalcedony, and pyrite. It has been altered by the action of hydrothermal solutions accompanying mineralization in the vicinity of the shear zones.

SiO_2 45.55%, Al_2O_3 16.92%, Fe_2O_3 + FeO 16.92%, MgO 6.71%, CaO 1.74%, total = 87.84%.

A.H. Lang (1930, p. 79)

472. **MINERALIZED CHLORITE SCHIST.** From the core of No. 2 orebody, Hidden Creek mine, Granby Bay, Observatory Inlet, B.C.

103–P–W½ (Anal. ?) Ser. No. *1913–53*

The orebody in a deposit in a greenish chloritic schist probably of sedimentary origin, but the original characters have been entirely obscured by the repeated metamorphism of the region. It is made up mostly of chlorite and other micaceous minerals with quartz, a little feldspar, and sulphides. Tremolite and actinolite are occasionally present. Strongly schistose as a rule near the orebody.

SiO_2 33.3%, Al_2O_3 11.4%, MgO 4.4%, CaO 3.3%, S 16.0%, Fe 24.3%.

R.G. McConnell (1914a p.55) *See also* No. 470 (*1913–54*)

473. **MINERALIZED ARGILLITE.** From the core of No. 1 orebody, Hidden Creek mine, Granby Bay, Observatory Inlet, B.C.

103–P–W½ (Anal. ?) Ser. No. *1913–51*

The orebody consists of an elongated mass of sulphides formed entirely in altered argillites here and there in contact with greenstones. Along the northern border is a quartz schist zone consisting of strongly silicified argillites, lean in sulphides. Chalcopyrite is present practically everywhere, but the quantity varies and the copper content is too low for profitable extraction. The ores are replacement deposits consisting of pyrite and pyrrhotite.

SiO_2 24.8%, Al_2O_3 6.4%, MgO 1.7%, CaO 5.2%, S 28.1%, Fe 26.7%.

R.G. McConnell (1914a, p. 55) *See also* No. 469(*1913–52*)

474. **HIGHLY ALTERED VOLCANIC.** Princeton District, Similkameen Belt mining division, B.C.

92–H–E½ (Anal. R.J.C. Fabry) Ser. No. *1941–4*

(a) An aqueous extraction was made by boiling the rock powder with water, and filtering off the residue, which amounted to 90.82% of the

sample. Solution was analysed giving: MgO 0.36%, CaO 0.53% $(Fe, Al)_2O_3$ 0.50%.
(b) An aqueous extraction was made on a separate portion and found to contain SO_3 = 2.11%.
(c) A third extraction was made by boiling with concentrated hydrochloric acid giving: insol. 84.67%, Fe_2O_3 2.23%, Al_2O_3 1.97%, CaO 0.82%, MgO 0.36%.

(W.E. Cockfield)

475. **METAMORPHOSED LIMESTONE.** The Toll-gate, Montreal, Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1857–6*

Bluish fossiliferous Trenton limestone traversed by dykes of dolorite. For a distance of a foot or two it is hardened but retains its bluish tint. Specimen was treated with dilute HCl and HNO_3 and the insoluble residue analyzed.
SiO_2 73.02%, Al_2O_3 18.31%, FeO trace, MgO 0.87%, CaO 0.93%, Na_2O 0.89%, K_2O 5.55%, total 99.57%.

T.S. Hunt (1858, p. 199) *See also* Nos. 477, 478 (*1863–20, 18*)

476. **DOLOMITE.** From the locally metamorphosed strata near a dolerite intrusion; Rouville co., Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1858–7*

Rock is made up of thin layers (variable in thickness and interrupted) of white, crystalline, red-weathering dolomite and compact greenish grey mineral with interposed layers of blackish green, crystalline hornblende from 1/6 to ¼ inch in thickness. Minute grains of pyrite are disseminated throughout the rock. A portion of the hornblende-free rock was treated with warm dilute nitric acid.

(a) The acid-soluble portion: $CaCO_3$ 38.9%, $MgCO_3$ 31.2%, $FeCO_3$ 29.9%, total 100.0%.
(b) The acid-insoluble portion decomposed by fusion with sodium carbonate: SiO_2 65.40%, Al_2O_3 10.10%, FeO 4.80%, MgO 2.05%, CaO 0.56%, TiO_2 7.30%, volatile 2.20%, loss 7.59%, total 100.00%.

T.S. Hunt (1859, p. 187)

477. **METAMORPHOSED LIMESTONE.** Trenton limestone, at the Toll-gate, Montreal, Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1863–20*

Limestones for a distance of a foot or two from intrusion of a dolerite dyke are hardened, but retain their bluish tint. Within a few inches the colour changes to greenish white owing to a disseminated amorphous mineral. Where unaltered the limestone is bluish and fossiliferous.

Sample was treated with dilute HNO_3 and the insoluble portion analyzed: SiO_2 54.00%, Al_2O_3 14.00%, FeO 3.60%, MgO 5.27%, CaO 60.24%, Na_2O 1.22%, K_2O 3.14%, volatile 0.90%, total 98.77% (98.37).

Geological Survey (1863, p. 582) — *See also* Nos. 475, 478 (*1857–6, 1863–18*)

478. **ALTERED LIMESTONE.** From a few inches of dolerite dyke traversing the Trenton Group, Toll-gate, Montreal, Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1863–18*

Greenish white owing to an amorphous mineral disseminated in the white limestone. Two portions were analyzed; they were treated with dilute HNO_3 and the insoluble residue analyzed:

(a) SiO_2 42.69%, Al_2O_3 13.70%, FeO 4.68%, MgO 4.17%, CaO 31.69%, volatile 1.20%, total = 98.04%.

(b) SiO_2 40.20%, Al_2O_3 9.30%, CaO 36.40%, MgO 3.70%, FeO 5.22%, volatile 0.20%, total = 95.02%.

Geological Survey (1863, p. 582) — *See also* Nos. 475, 477 (*1857–6, 1863–20*)

479. **OPHIOLITE, CONGLOMERATIC.** Brompton Lake, lot 12, rge. 18, Orford tp., Sherbrooke co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1856–25*

A greenish white conglomerate or breccia holding masses of serpentine and containing nickel and grains of chromic iron ore. Two portions were analyzed.

(a) One portion was treated with $HC_2H_3O_2$, which removed 20%, the residue of which was treated with HNO_3, partly dissolving the serpentine: SiO_2 45.10%, Al_2O_3 0.80%, FeO 6.12%, MgO 34.68%, H_2O 13.30%, total = 100.00%.

(b) Another portion of the rock was treated similarly and still retained a mixture of carbonates when analyzed: SiO_2 43.93%, FeO 7.83%, CaO trace, MgO 35.64%, H_2O and H_2CO_3 12.60%, total = 100.00%.

T.S. Hunt (1857c, p. 439) — *See also* No. 1058 (*1856–24*)

480. **OPHIOLITE, DOLOMITIC.** From the shore of Brompton Lake, lot 7, rge. 13, Orford tp., Sherbrooke co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1856–18*

Fine-grained, greyish green rock, which weathers reddish brown. A fibrous coating is in places apparent in the joints of the rock. The specimen was treated with dilute HNO_3.

(a) Soluble portion: $CaCO_3$ 49.58%, $MgCO_3$ 46.32%, $FeCO_3$ and $MnCO_3$ 4.10%, total = 100.00%.

(b) A residue of 41.9% of serpentine was left: SiO_2 43.20%, FeO and NiO 8.29%, MgO 36.11%, H_2O 12.40%, total 100.00%.

T.S. Hunt (1857c, p. 439)

481. **OPHIOLITE, MAGNESITIC.** Lot 15, rge. 1, Melbourne tp., Richmond co., Que.

31–H–E½ (Anal. B.J. Harrington) Ser. No. *1874–20*

Ferriferous magnesite scattered through serpentine in small irregular crystalline masses of a pale brown colour. The serpentine is olive green and has a splintery fracture. The magnetic 15.50% of the rock was separated from the serpentine by dilute HNO_3.
(a) Acid soluble portion: $FeCO_3$ 14.84%, $MgCO_3$ 83.23%, $CaCO_3$ 1.93%, total = 100.00%.
(b) Acid insoluble portion: SiO_2 42.79%, FeO 6.05%, MgO 36.54%, H_2O (by ignition) 13.37%, Cr_2O_3 0.29%, NiO and CoO 0.37%, total 99.53%.

B.J. Harrington (1876, p. 309)

482. **OPHIOLITE.** Burgess tp., Leeds co., Ont.

31–C–E½ (Anal. T.S. Hunt) Ser. No. *1856–26*

A reddish brown serpentine or ophiolite from which a portion of the Ca and Mg carbonates was removed by $HC_2H_3O_2$: SiO_2 39.80%, Fe_2O_3 7.92%, MgO 38.40%, H_2O 13.80%, total 100.00% (99.92).

T.S. Hunt (1857c, p. 482)

483. **SERPENTINE.** Pigeon Lake Island, Montreal River, Timiskaming district, Ont.

41–P–E½ (Anal. B.J. Harrington) Ser. No. *1876–21*

A dark green serpentine with strings of calcite and chrysotile. Fresh fractures have mottled appearance, occasionally presenting surfaces of a striated or finely columnar, shining aspect. The natural surface has a rough or lumpy character, and weathers to a rusty colour. In places the rock is traversed by minute veins consisting of Ca, Mg, and Fe carbonates. The rock was treated with $HC_2H_3O_2$.
(a) Acid soluble portion (21.39%): $CaCO_3$ 37.90%, $MgCO_3$ 51.95%, $FeCO_3$ 10.15%, total = 100.00%.
(b) Insoluble portion: SiO_2 34.59%, Al_2O_3 2.39%, FeO 8.66%, MgO 32.25%, CaO 3.63%, MnO 0.24%, H_2CO_3 and H_2O 17.57% (by ignition) Cr_2O_3 0.38%, chromic iron grains 0.28%, total = 99.99%.

B.J. Harrington (1878, p. 483)

ANALYSES OF SEDIMENTARY ROCKS

484. **QUARTZITE.** From the vicinity of Bulwer, 13 miles east of Sherbrooke, Sherbrooke co., Que.

21–E–W½ (Anal. R.J.C. Fabry) Ser. No. *1940–1*

Regarded as a possible source of silica for the production of metallic silicon.

(H. Frechette)

485. **GLASS SAND.** Beneath the clay beds on the Mattagami River, in the vicinity of Long Portage, Cochrane district, Ont.

42–J–E½ (Anal. L.J. Rogers) Ser. No. *1924–23*

White sand composed almost entirely of subangular and rounded quartz grains with which is intermingled a small quantity of white clay. The sample was freed from the clay and screened to the proper texture for glass making.

J. Keele (1924, p. 38)

486. **GLASS SAND.** In cliffs 30 to 40 feet high, Dakota Formation; on the south shore of Wapawekka Lake, Sask.

63–L–E½ (Anal. H.A. Leverin) Ser. No. *1909–4*

White quartz sand and loosely coherent sandstone occur as thick beds. The quartz grains are subangular and fairly uniform in size. Iron oxide and alumina occur as coating and cementing materials.

W. McInnes (1910, p. 157)

487. **SAND.** Lens-like masses, stratified in places; on the Missinaibi River, in the vicinity of the mouth of the Wabiskagami River, Algoma and Cochrane districts, Ont.

42–J–W½ (Anal. A. Sadler) Ser. No. *1924–24*

Made up almost wholly of quartz particles of rather coarse texture with angular outline, and coated with white clay, which was washed off for analysis.

J. Keele (1924, p. 38)

	484	485	486	487	488
SiO_2	99.41	99.1	98.60	97.72	97.74
Al_2O_3	0.42	0.32	) 1.20	0.42	0.44
Fe_2O_3	0.21			) 0.32	0.09
FeO					0.70
MgO	0.06	trace		0.21	0.25
CaO	0.22	trace		0.28	0.33
Na_2O					
K_2O					
H_2O+					0.53
H_2O-					0.07
TiO_2	nil				nil
P_2O_5					
MnO					0.03
CO_2					nil
Fe		0.18			
impurities			0.20		
ignition less				0.12	
Total	100.32	99.60	100.00	99.07	100.18

488. **CHERT.** From a band or bed about 5 feet thick at a 3,100-foot elevation at a point about midway between Gun River and Little Gun Lake, and a little north of the pass between Little Gun Lake and Lajoie Lake, Lillooet district, B.C.

92–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1935–25*

Very characteristic massive chert as contrasted with ribbon chert variety. Exceedingly fine grained, almost colourless, and composed of quartz particles threaded by veins of granular quartz interlocking along their walls with the chert. Minor proportions of ankeritic carbonate occur in both groundmass and veins and appear to have the same origin as the chert.

C.E. Cairnes (1937, pp. 10–11) *See also* Nos. 180, 215, 438, 442 (*1935–24, 23, 22, 21*)

489. **CHERT.** More or less intimately associated with the slates of the Taku Arm Group, Atlin, B.C.

104–N–W½ (Anal. Mines Branch) Ser. No. *1913–39*

Light to dark grey to black rock, in places reddish on weathered surfaces owing to the oxidation of small amounts of constituent iron ore. Massive, hard, brittle, breaking into sharp edged, irregularly shaped fragments.

D.D. Cairnes (1913, p. 52)

490. **QUARTZITE.** Taken 3 feet from a radioactive vein, ½ mile east of Melville Lake, ¼ mile north of Beaverlodge Lake, Sask.

74–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–13*

White weathering, fine-grained, unaltered quartzite showing a few suggestions of thin bedding, and consisting of a fine-grained mosaic of quartz with veinlets of coarser quartz, feldspar, and carbonate.

K.R. Dawson (1951, p. 55)

491. **QUARTZITE.** On top of the section of Lorraine quartzite, near the head of Ottertail Lake, Plummer tp., Algoma district, Ont.

41–J–W½ (Anal. M.F. Connor) Ser. No. *1925–4*

A pure, white quartzite forms the upper third of the section and grades imperceptibly downwards into an impure, reddish or pale green quartzite. It appears as a mosaic of interlocking quartz individuals due to its complete cementation, but inside many of these individuals there can still be discerned faint outlines of the original sand grains, although none are thoroughly rounded.

W.H. Collins (1925, p. 68)

492. **CHERT.** Over 7 miles from the summit of Mount Schroeder, at the head of Falls Creek, northern edge of Sandon map-area, Kootenay district, B.C.

82–F–W½ (Anal. W.A. Jones) Ser. No. *1934–31*

	489	490	491	492	493
SiO_2	96.82	95.55	95.32	92.04	87.88
Al_2O_3	1.10	2.26	2.85	2.21	4.90
Fe_2O_3	0.55	0.48	0.05	0.85	0.45
FeO	0.37	0.74		1.08	2.20
MgO	trace	0.08	0.04	1.02	0.56
CaO	trace	0.73	trace	0.75	0.20
Na_2O	0.30	0.48	0.30	0.40	2.00
K_2O	0.26	0.17		0.64	
H_2O+	0.30	0.12		0.53	
H_2O-	trace	0.18			
TiO_2	0.05	0.03			
P_2O_5	0.01	0.03			0.04
MnO	trace	nil			0.01
CO_2		nil			
S		nil			
Cr_2O_3					0.12
ignition loss			1.44		1.54
Total	99.76	100.85	100.00	99.52	99.90
Sp.gr.	2.64				

Dense, hard rock, colour-banded in pale tints of red, purple, and green to creamy white, but with light green to white the predominant colour. Bands vary in width from less than an inch to several feet, and mostly follow the bedding, which is marked by fine, closely spaced lines and is not everywhere readily detected. Extremely fine grained, composed largely of minute particles of silica lacking regular boundaries and containing wisps of chloritic and sericitic material, a little epidote, and grains of magnetite, some of which are partly oxidized. Bedding is indicated by parallel thin bands of slightly varying coarseness.

C.E. Cairnes (1934, p. 40)

493. **SILICEOUS BRECCIA.** A cliff 20 feet high, ½ mile southeasterly from the northern end of the east arm of Steeprock Lake and about 250 feet inland from the western shore, Rainy River district, Ont.

52–B–W½ (Anal. M.F. Connor) Ser. No. *1925–8*

Made up of light and dark green fragments of earthy material averaging between ¼ and ⅛ inch in diameter, lying in a matrix of chert and ferruginous carbonate. A few lenses of chert, up to 4 inches in length, are irregularly distributed through the rock. No bedding is apparent. In places the rock is schistose. The rock at the top of the cliff has been replaced by dense, hard, brown limonite through which is a system of tiny vugs.

T.L. Tanton (1927, p. 5)

494. **QUARTZITE.** Lorraine Quartzite; 2,000 feet northeast of the East Lighthouse, Killarney, Manitoulin co., Ont.

41–H–W½ (Anal. R.J.C. Fabry) Ser. No. *1927–1*

White or pale sea-green, coarse-grained, feldspathic rock occurring in beds. The feldspar has been mostly changed by shearing and decomposition to silvery white or pale green secondary mica, and here and there the surface is stained bright red by oxidation of nests and disseminated grains of pyrite. It consists of a rather fine-grained mosaic of clear, equidimensional interlocking grains of quartz with shreds of aggregates of mica. The mica shreds in parallel orientation give marked schistosity. Pyrite forms small, rounded, or irregular grains. No ferromagnesian minerals are present. Secondary phenocrysts of quartz, distinctly hexagonal or diamond shaped, are found in the groundmass.

T.T. Quirke and W.H. Collins (1930, p. 51)

495. **QUARTZITE.** Western phase of Creston Formation; exposed at McKimm Cliff, 4 miles from Porthill, Purcell Mountain system, B.C.

82–F–E½ (Anal. M. Dittrich) Ser. No. *1912–32*

A very hard and tough homogeneous quartzite, thick and massive in the top and bottom divisions, and thinner in the middle. Often more massive plates are seamed with thin, dark grey laminae of argillaceous quartzite or meta-argillite. In places it shows crossbedding. Interlocking quartz, feldspar, and mica, all glass-clear, are the essential constituents. Orthoclase, microcline, microperthite, oligoclase, and probably albite make up the feldspars. Mica includes biotite and muscovite, the latter in plates or typical shreds of sericite. Titanite, titaniferous magnetite, pyrite, epidote, and zoisite are subordinate constituents.

R.A. Daly (1912, p. 125) *See also* No. 535(*1912–33*)

496. **JASPER-LIKE ROCK.** Two beds, interstratified with arenaceous shales of the Hudson River Formation; near Cape Rouge, Levis co., Que.

21–L–W½ (Anal. T.S. Hunt) Ser. No. *1856–13*

Perfectly homogeneous in texture, with sharply conchoidal fracture, and varying in colour from dark grass-green to blackish green. It is traversed by veins of calcareous spar.

T.S. Hunt (1857c, p. 459)

497. **QUARTZITE.** Western phase of the Kitchener Formation, overlying the Creston Formation; near the boundary monument on the isolated mountain immediately west of the Moyie River, Purcell Mountain Range, B.C.

82–F–E½ (Anal. M.F. Connor) Ser. No. *1912–34*

	494	495	496	497
SiO_2	82.15	82.10	77.50	76.90
Al_2O_3	12.46	8.86	8.50	11.25
Fe_2O_3	0.70	0.49		0.69
FeO	0.16	1.38	2.70	3.04
MgO	0.54	0.56	2.35	1.01
CaO	0.38	0.82	0.73	0.88
Na_2O	0.22	2.51	1.38	3.28
K_2O	1.39	2.41	1.66	1.36
H_2O+	2.23	0.37		1.20
H_2O-	nil	0.05		0.20
TiO_2	0.11	0.40		0.35
P_2O_5	0.11	0.04		0.15
MnO	nil	0.03		0.02
CO_2	nil			trace
S	nil			
Cl	trace			
BaO	nil			
volatile			4.40	
Total	100.35 (100.45)	100.02	99.22	100.33
Sp.gr.		2.681	2.64–2.66	2.680

Uniform grey or greenish grey rock, in beds averaging 3 inches in thickness with a few whitish beds up to 20 feet thick. Many of the thinner strata can be grouped into strong, non-fissile plates several feet thick. Cross-bedding, ripple marks, and sun cracks were seen at various horizons in both the quartzite and interbedded meta-argillite. The essential constituents are interlocking grains of glassy quartz and feldspars and a variable, generally abundant quantity of sericite, biotite, and possibly paragonite. Quartz forms 50 to 80% of rock. The feldspars are sodiferous orthoclase, microperthite, and untwinned albite. Secondary epidote and kaolin, with magnetite, pyrite, zircon, and apatite grains are minor constituents. The grain is always fine.

R.A. Daly (1912, p. 130)

498. **QUARTZITE.** From the Archean sedimentary series consisting of quartzite, with thin layers of clay material, and some beds of boulder conglomerate, grading into gneissic granite; Aillik, Labrador.

13–O–W½ (Anal. B. Salovius) Ser. No. *1953–16*

Well crystallized, xenoblastic texture. Primary bedding defined by the arrangement of magnetite, biotite, muscovite, and epidote in bands. Feldspar occurs abundantly.

E.H. Kranck (1953, p. 21)

499. **QUARTZITE.** Occurring mainly in well-defined beds that are in sharp contact with adjoining rocks, or as structureless masses in association with granulite; Giauque Lake, District of Mackenzie.

85–O–E½ (Anal. R.J.C. Fabry) Ser. No. *1950–1*

Fine-grained to dense, fresh-looking rock with obvious relics of clastic structure and composed of a few large fragments of quartz and feldspar in a very fine grained groundmass of interlocking quartz, feldspars (andesine and albite), and oriented mica flakes. Either muscovite or biotite may occur, and together they comprise about 25%. Abundant nodules of andalusite locally stand out in relief on weathered surfaces.

L.P. Tremblay (1952, p. 17)

500. **CLAY.** Pierre Formation; Souris City, Souris River, Man.

62–F–E½ (Anal. F.G. Wait) Ser. No. *1892–8*

Compact, light bluish grey, dull, smooth clay, breaking with irregular or occasionally imperfectly conchoidal fracture.

G.C. Hoffmann (1895, p. 33)

	498	499	500	501	502
SiO_2	75.69	71.13	79.55	74.25	74.03
Al_2O_3	13.60	17.88	8.35	14.29	17.30
Fe_2O_3	0.49	0.82	1.90	2.89	1.15
FeO	0.22	1.67			
MgO	trace	1.54	1.02	trace	0.16
CaO	0.92	0.55	1.50	0.37	0.38
Na_2O	5.80	3.06	0.01	1.19	0.53
K_2O	2.68	2.09	1.16	2.52	0.88
H_2O+	0.26	0.95	3.50		
H_2O-	0.03	0.25	2.56		4.78
TiO_2	trace	0.36			1.04
P_2O_5	nil				
MnO	0.01				
CO_2	0.71				
ignition loss.......				4.21	
Total	100.41	100.30	99.55	99.72	100.25

501. **CLAY.** Coleridge, Alta.

72–E–E½ (Anal. G.E.F. Lundell) Ser. No. *1913–12*

Light grey, massive clay, containing a relatively large amount of grains larger than clay substances.

H. Ries and J. Keele (1913, p. 89)

502. **CLAY.** Shubenacadie, Hants co., N.S.

11–E–W½ (Anal. M.F. Connor) Ser. No. *1911–10*

H. Ries (1911, p. 87)

503. **CLAY.** From the wall of a test pit along Small Brook, About 1 mile northwest from Woodburn Station, Pictou co., N.S.

11–E–E½ (Anal. A.L. McCallum Ser. No. *1911–6*

(a) and (b) are analyses of two different samples.

H. Ries (1911, p. 58)

504. **ARGILLITE.** MacDonald Formation; top of the 6,700-foot summit about 2,300 yards southwest of the International Boundary monument at Wigwam River, MacDonald Range, B.C.

82–G–E½ (Anal. M. Dittrich) Ser. No. *1912–31*

Notably homogeneous, thin-bedded argillite originally consisting of more than one-half clayey matter, in which small angular grains of clastic quartz, microcline, microperthite, and plagioclase were embedded. It has been partly recrystallized and carries variable amounts of sericite, chlorite, and cryptocrystalline silica. Carbonate grains are distributed through the siliceous matrix.

R.A. Daly (1912, p. 102)

505. **CLAY.** North end of the Lake of the Rivers, south of the Souris River, near the Expanse Branch of the Canadian Pacific Railway, Sask.

72–A–W½ (Anal. W.S. Bishop) Ser. No. *1915–25*

Greyish white, sandy clay.
(a) and (b) are two analyses of the same sample.

J. Keele (1915b, p. 23)

	503 (a)	503 (b)	504	505 (a)	505 (b)
SiO_2	70.15	73.58	68.37	68.17	66.30
Al_2O_3	19.01	15.93	7.02	21.76	19.02
Fe_2O_3	1.27	) 3.17	4.41		
FeO			3.99	1.98	5.60
MgO	0.86	0.27	4.41	0.72	0.60
CaO	0.59	0.14	3.89	0.22	0.11
Na_2O	) 0.91	) 0.59	0.87	) 1.20	
K_2O			1.34		
H_2O+	) 7.14	) 6.21	3.60		
H_2O-			0.25		
TiO_2					
P_2O_5					
MnO					
CO_2			1.91		
ignition loss				6.07	7.29
Total	99.93	99.89	100.06	100.12	98.92
Sp.gr.			2.687		

506. **SHALE.** North half of sec. 15 in rge. 22, tp. 39, west of the 4th meridian along the Lacombe Branch of the Canadian Pacific Railway, Alta.

83–A–W½ (Anal. T.H. Young) Ser. No. *1915–26*

Quite hard, rather massive, white clay or shale, which breaks into irregular lumps. Sandy in texture when dry.

J. Keele (1915b, p. 34)

507. **ARGILLITE.** In the immediate vicinity of the serpentine and steatites; Etchemin River, 2 miles above St. Anselm, Dorchester co., Que.

21–L–E½ (Anal. T.S. Hunt) Ser. No. *1851–1*

A red rock showing no appearance of alteration.

T.S. Hunt (1852b, p. 97)

508. **GREYWACKE.** Giauque Lake, District of Mackenzie.

85–O–E½ (Anal. R.J.C. Fabry) Ser. No. *1950–6*

Massive, with a pronounced sandy appearance on a weathered surface and a faint suggestion of schistose structure. Generally uniform, although the thickest beds may show faint banding, which may represent incipient bedding or crossbedding. Sun, or fire, cracks are common, and current ripple marks and channelling were also noted. Composed of scattered, large, angular to oval, uniformly-distributed fragments of quartz and feldspar, including andesine feldspar, and a fine-grained, abundant groundmass mosaic of biotite, feldspar, and quartz. Biotite occurs as flakes of variable size, all oriented in the same way. Minor amounts of chlorite, sericite, zircon, and garnet are present.

L.P. Tremblay (1952, p. 17)

509. **CLAY.** Underlying lignite seam; Tofield, Alta.

83–H–E½ (Anal. G.E.F. Lundell) Ser. No. *1913–13*

Dark, grey, soft shale.

H. Ries and J. Keele (1913, p. 89)

510. **SHALE.** Under a coal seam; Flower Cove, Grand Lake, Sunbury co., N.B.

21–J–E½ (Anal. ?) Ser. No. *1914–16*

J. Keele (1914, p. 32)

	506	507	508	509	510
SiO_2	66.37	66.00	65.76	65.23	63.68
Al_2O_3	26.62		17.79	18.60	23.80
Fe_2O_3		24.60	0.32	2.97	1.20
FeO			4.68		
MgO	trace	traces	2.97	0.64	0.20
CaO	0.42	traces	1.90	0.66	0.40
Na_2O	0.42	2.22	4.48	2.23	1.43
K_2O		3.67	0.75	2.40	
H_2O+			1.43		8.77
H_2O-			0.15		
TiO_2			0.53		
P_2O_5					
MnO					
CO_2					
SO_3	trace				
Fe	1.28				
Ti	trace				
ignition loss	5.15			7.30	
volatile		3.00			
Total	100.26	99.49	100.76	100.03	99.48

511. **SHALE.** From above and below the coal in the shaft of the Rock Springs Mine of the Superior Coal Company, opening on the side slopes of the Belly River, about 2 miles north of Taber, Alta.

82–H–E½ (Anal. Superior Coal Company) Ser. No. *1912–5*

(a) is a sample of the top shale, and (b) a sample of the bottom shale.

H. Ries (1912, p. 226)

512. **SHALE.** Outcropping in a low terrace on the property of Mr. Octave Lablanc, about 1 mile east of the village of St. Gregoire, south of Lake St. Paul, Nicolet co., Que.

31–I–E½ (Anal. J. Keele) Ser. No. *1915–19*

J. Keele (1915a, p. 35)

513. **SHALE.** From beneath a thin bed of coal, and lying on top of a bed of slightly kaolinized volcanic rock; Kilgard, south side of Sumas Mountain, B.C.

92–G–E½ (Anal ?) Ser. No. *1915–24*

H. Ries (1915, p. 16)

	511 (a)	511 (b)	512	513	514
SiO_2	63.2	68.4	63.0	62.80	62.61
Al_2O_3	19.2	18.0	18.58	35.00	16.78
Fe_2O_3	5.4	4.0	) 5.57	1.80	0.38
FeO					5.81
MgO	1.2	1.0	2.46	trace	2.99
CaO	0.6	0.4	1.61	0.20	2.80
Na_2O			) 2.60		3.79
K_2O					1.56
H_2O+			) 1.78		1.94
H_2O-					0.12
TiO_2					0.68
P_2O_5					0.16
MnO					0.08
CO_2					0.10
S					0.14
SO_3			0.10		
Cl					0.02
C					0.13
Cr_2O_3					0.01
ignition loss	9.0	7.7	4.84		
Total	98.6	99.5	100.54	99.80	100.10
Less O≡S					0.06
					100.04
Sp.gr.					2.73[1]

[1] Average of three determinations

514. **GREYWACKE.** Composite sample of the greywacke facies; from near the Burwash shaft and Yellowknife River, Yellowknife, District of Mackenzie.

85–J–E½ (Anal. J.A. Maxwell) Ser. No. *1955–8*

Massive grey rock containing quartz, albite, biotite, pyrrhotite, muscovite. R.W. Boyle (1961, p. 127)

515. **CONGLOMERATE MATRIX.** Lot 14, Thompson tp., Algoma district, Ont.

41–P–E½ (Anal. M.F. Connor) Ser. No. *1917–1*

An unstratified, ordinary, dark grey greywacke, which forms the cement of a boulder conglomerate distinguished by the preponderence of cement over boulder and pebbles, and by the extreme diversity in size, shape, and composition of the latter. The groundmass consists of quartz and feldspar grains, composite rock fragments, scales of chlorite, etc., ranging in size from fine sand grains to ultramicroscopic dust. There is little evidence of assortment, or of weathering, for the feldspars are still fresh and clear.

W.H. Collins (1917, p. 65)

516. **CLAY.** From a clay bank, 75 to 100 feet thick, made up of stratified clay and sand; Deschaillons, Lotbinbière co., Que.

21–L–W½ (Anal. J. Keele) Ser. No. *1915–22*

Clay is well stratified in layers about ½ inch thick, with thin films of sand or silt between the layers. The clay is bluish grey in lower parts and upper layers are brownish red, with ash-coloured films of silt between them. The clay part is free from pebbles.

J. Keele (1915a, p. 87)

517. **SHALE.** Lorraine shale; lot 25, con. 2, Gloucester tp., Carleton co., Ont.
31–G–W½ (Anal. ?) Ser. No. *1924–20*

J. Keele (1924, p. 19)

518. **CLAY.** A variety of clay, Fuller's earth, constitutes the underclay of a seam of lignite; Rock Creek, about 9 miles above its entry into the Klondike River, Yukon Territory.

115–O–E½ (Anal. R.A.A. Johnston) Ser. No. *1900–3*

Massive, light, greenish grey, dull clay, with a greasy feel, and breaking with an earthy fracture.

G.C. Hoffmann (1903, p. 19)

519. **GREYWACKE.** Composite sample taken across the entire width of a slate belt; in the vicinity of the Kettle Valley Railway, Coquihalla River area, Yale district, B.C.
92–H–W½ (Anal. M.F. Connor) Ser. No. *1924–5*

Two types of rock are present. The first is a hard, massive grey rock containing conspicuous irregular fragments of black argillite less than ¼ inch in diameter; the groundmass is fine grained and siliceous with fragments of feldspar and quartz crystals. The feldspar fragments predominate and include both plagioclase and potassic varieties; sericite and calcite are alteration products. The second type has the hardness of the finer-grained slates, and is nearly black on fresh surfaces; it has a fine, argillaceous groundmass with scattered fragments of fresh-looking feldspars, a smaller proportion of quartz crystals, and grains of volcanic and felsitic rocks.

C.E. Cairnes (1924, p. 49)

	515	516	517	518	519
SiO_2	61.96	61.9	61.60	60.64	61.36
Al_2O_3	17.20	21.08	17.62	19.28	16.20
Fe_2O_3	1.42	5.72	7.32	3.24	0.88
FeO	4.49			0.51	5.17
MgO	3.27	2.44	3.07	2.66	2.00
CaO	1.00	3.62	0.68	1.64	1.40
Na_2O	5.27	0.32	4.27	1.86	2.57
K_2O	2.04			0.34	1.65
H_2O+	2.70	1.00		10.23	5.87
H_2O-	0.10				0.33
TiO_2	0.60				0.70
P_2O_5					0.11
MnO	0.10				0.04
CO_2					0.46
SO_3		0.12			0.08
FeS_2					0.62
Fe_7S_8					0.29
organic matter					0.82
ignition loss		3.39	5.81		
Total	100.15	99.59	100.37	100.40	100.55

520. **ARGILLITE.** Island of Orleans, Que.

21–L–E½ or W½ (Anal. T.S. Hunt) Ser. No. *1863–5*

Soft, greyish green shale, containing no carbonates, and containing a layer ¼ inch thick of black shale, both of which are analyzed: (a) is the green shale, and (b) is the black shale.

Geological Survey (1863, p. 601)

521. **SHALE.** From a large, included mass of Animikie shale within a large diabase dyke and bordered by a granophyre complex; Pyritic Island, Sibley tp., Thunder Bay district, Ont.

52–A–E½ (Anal. M.F. Connor) Ser. No. *1931–18*

Grey shale, mottled and streaked with pinkish grey, and very fine grained. Shadow-like outlines of a felt of cloudy, anisotropic minerals can be resolved.

T.L. Tanton (1931, p. 74) *See also* Nos. 131, 146 (*1931–19, 20*)

522. **CLAY.** Standard Clay Products Company Works, situated on the Canadian Pacific Railway, 1 mile west of St. John, Que.

31–H–W½ (Anal. W.S. Bishop) Ser. No. *1915–20*

Ordinary, grey or drab clay, extremely fine grained and smooth when wet.

J. Keele (1915a, p. 76)

523. **CLAY.** South Fork Area, Crowsnest Pass Region, B.C.–Alta. border.

82–G–E½ (Anal. ?) Ser. No. *1914–19*

H. Ries (1914, p. 27)

	520 (a)	520 (b)	521	522	523
SiO_2	60.85	58.20	60.79	60.20	59.23
Al_2O_3	15.80	21.20	16.79	21.68	20.00
Fe_2O_3			1.05	) 4.05	3.36
FeO	5.94	4.23	5.67		
MgO	4.10	2.48	2.76	2.80	1.51
CaO	1.92	1.23	0.96	2.00	3.86
Na_2O	1.22	1.43	2.80	) 3.22	) 2.34
K_2O	4.34	3.86	3.77		
H_2O+			4.06		
H_2O-			0.24		
TiO_2			0.80		0.21
P_2O_5			0.12		
MnO			0.04		
CO_2					
NiO			0.04		
Fe_7S_8			0.31		
volatile	4.90	5.30			
ignition loss				3.97	8.03
Total	99.07	97.93	100.20	98.02	98.54

524. **SHALE.** Ontario Paving Brick Company, Islington, York co., Ont.

30–M–W½ (Anal. ?) Ser. No. *1924–19*

J. Keele (1924, p. 19)

525. **CLAY.** Missinaibi River, about 45 miles north of the Canadian National Railways and about 4 miles above the mouth of the Wabiskagami River, Cochrane district, Ont.

42–J–W½ (Anal. M.F. Connor) Ser. No. *1919–22*

White, plastic clay, visible in the bed of the river and attaining a height of 74 feet above the water level.

J. Keele (1920, p. 14) *See also* No. 530 (*1919–22*)

526. **CLAY.** Northwest corner of Peel and St. Catherine Streets, Montreal, Hochelaga co., Que.

31–H–W½ (Anal. Milton Hersey and Co. Ltd) Ser. No. *1915–27*

Subangular boulders are embedded in a very fine grained, stiff clay, which is made up of the finer fragments without any regular arrangement or distribution. The matrix when fresh is dark bluish grey.

J. Stansfield (1915, p. 9)

527. **CLAY.** Rimouski River Valley, about 1 mile from Rimouski, Rimouski co., Que.

22–C–E½ (Anal. J. Keele) Ser. No. *1915–23*

Massive, blue-grey clay with purple patches.

J. Keele (1915a, p. 101)

528. **SHALE.** Utica-Lorraine Formation; on the banks of a small brook cutting through the shale escarpment a short distance north of the St. Augustin Station, Portneuf co., Que.

21–L–W½ (Anal. W.S. Bishop) Ser. No. *1915–18*

J. Keele (1915a, p. 26)

	524	525	526	527	528
SiO_2	59.21	58.90	58.85	56.42	56.30
Al_2O_3		26.63	13.25	20.56	18.12
Fe_2O_3	5.37	1.40	6.25		
FeO				) 6.03	) 3.68
MgO	3.30	0.16	2.61	3.52	3.30
CaO	3.32	0.56	7.00	3.95	6.62
Na_2O	) 1.60	0.42	7.67	) 2.90	) 1.20
K_2O		0.31	3.60		
H_2O+		) 10.30		) 0.60	) 1.54
H_2O-					
TiO_2		1.25			
P_2O_5					
Mn		0.01			
CO_2					
SO_3			2.47	0.27	1.80
ignition loss	9.16		7.67	6.55	8.26
Total	100.38	99.94	101.70 (109.37)	100.80	100.82

529. **CLAY.** Overlying a 13-foot coal seam at Inverness, Inverness co., Cape Breton Island, N.S.

11–K–W½ (Anal ?) Ser. No. *1914–18*

J. Keele (1914, p. 32)

530. **CLAY.** Missinaibi River, about 45 miles north of the Canadian National Railways and about 4 miles above the mouth of the Wabiskagami River, district, Ont.

42–J–W½ (Anal. A. Sadler) Ser. No. *1919–22*

Mottled, pink clay associated with white clay.

J. Keele (1920, p. 14) *See also* No. 525 (*1919–22*)

531. **CLAY.** From a bore hole farthest up Murphy Brook, Middle Musquodoboit River, N.S.

11–E–W½ (Anal. M.F. Connor) Ser. No. *1911–7*

Light grey clay.

H. Ries (1911, p. 81)

532. **SHALE.** Upper 7 feet of the Cabot Head shale exposed in a gorge just above the line of the Toronto, Hamilton, and Buffalo Railway, Stoney Creek, Wentworth co., Ont.

30–M–W½ (Anal. A. Sadler) Ser. No. *1924–21*

J. Keele (1924, p. 25)

	529	530	531	532	533 (a)
SiO_2	55.52	55.17	55.14	54.28	53.20
Al_2O_3	26.80	28.06	28.84	22.12	30.25
Fe_2O_3	2.58	5.36	1.91	5.94	1.72
FeO					
MgO	1.05	0.16	0.25	3.58	trace
CaO	0.25	0.25	0.38	1.34	nil
Na_2O	0.73	0.03	0.48	0.49	1.33
K_2O	3.43	0.26	1.88	5.71	
H_2O+	8.39	9.13	9.24		
H_2O-					
TiO_2	1.50		2.37		1.47
P_2O_5					
MnO					
CO_2					
ignition loss				7.07	12.00
Total	100.25	98.42	100.49	100.53	99.97

533. **CLAY.** From an 18-foot bore hole, Murphy Brook, Middle Musquodoboit River, N.S.

11–E–W½ (Anal. F.H. Mason) Ser. No. *1911–8*

(a) Average sample from the bore core.
(b) Floated white clay.

H. Ries (1911, p. 83)

534. **CLAY.** Laramie Formation; large deposit forming a basin of limited extent for a seam of lignite, sec. 28, rge. 24, tp. 12, west of the second Meridian, Dirt Hills, Sask.

72–H–W½ (Anal. ?) Ser. No. *1913–11*

White, light, fireclay, sandy in character.

H. Ries and J. Keele (1913, p. 42)

535. **"QUARTZITE".** Eastern phase of the Creston Formation, Purcell Series; on the Commission Trail, about 1,000 yards west of the main fork of the Yahk River, B.C.

82–G–W½ (Anal. M. Dittrich) Ser. No. *1912–33*

Light grey, compact, thin-bedded rock having features of a feldspathic quartzite, a meta-argillite, and a magnesian limestone. The eastern phase differs from the western phase (*see* No. 495) in a decided decrease in the average thickness of the beds, a pronounced increase in the amount of argillaceous matter, which here forms many distinct beds and occurs as a notable impurity in the still dominant quartzite, and the appearance of calcium and magnesium carbonates as subordinate elements in both the quartzite and the more argillaceous strata. Thin sections are composed, in order of decreasing abundance, of carbonates, quartz, feldspar, sericitic mica, a little green biotite, and small grains of limonitized iron ore. The rock has been very largely recrystallized.

R.A. Daly (1912, p. 127)

536. **CLAY.** Post-glacial clay; from just east of the wharf, Port Dover, Woodhouse tp., Norfolk co., Ont.

40–I–E½ (Anal. Mines Branch) Ser. No. *1924–26*

The upper 8 feet of a 40-foot section of stratified clays and silts containing very few stones.

J. Keele (1924, p. 108)

537. **CLAY.** White clay intermingled with sub-angular and rounded quartz grains; forming a glass sand beneath clay beds on the Mattagami River in the vicinity of Long Portage, Ont.

42–J–E½ (Anal. L.J. Rogers) Ser. No. *1924–22*

J. Keele (1924, p. 38) *See also* No. 485 (*1924–23*)

	533 (b)	534	535	536	537
SiO_2	53.00	51.94	51.65	49.46	49.40
Al_2O_3	32.10	33.62	7.85	14.64	35.79
Fe_2O_3	1.70	1.5	1.74	5.14	
FeO			0.98		
MgO	trace	trace	3.67	2.75	trace
CaO	nil	0.23	15.02	10.82	trace
Na_2O	0.97	0.22	2.69	1.12	
K_2O		0.82	1.38	2.84	
H_2O+			1.81		
H_2O-			0.09		
TiO_2					
P_2O_5					
MnO					
CO_2			13.05		
SO_3		nil			
Fe					0.13
ignition loss	12.20	11.44		13.21	13.85
Total	99.97	99.77	99.93	99.98	99.17
Sp.gr.			2.654		

538. **CLAY.** Ojibway clay in a depression near the railway; ¼ mile east of the station, Matheson, Bowman tp., Cochrane district, Ont.

42–A–E½ (Anal. Mines Branch) Ser. No. *1924–27*

Post-glacial clay, exposed at about an 8-or 9-foot depth. Stratified, stoneless, brownish in the upper part, bluish grey below the weathered zone and appearing to be absolutely free from pebbles, concretions, or coarse grit. It underlies Matheson and the immediate vicinity.

J. Keele (1924, p. 124)

539. **SANDSTONE.** Parting rock; 2 feet above the floor of workable ore of Zone 4, Scotia Bed, location 206 J 2c3, Wabana Iron Ore Company, Bell Island, Newfoundland.

1–N–E½ (Anal. A.O. Hayes) Ser. No. *1915–58*

Ferruginous, green sandstone, with many shell fragments. Fragmental quartz is present, and crystalline quartz rarely, but when so it is between spherules of chamosite and hematite.

A.O. Hayes (1915, p. 52)

540. **CLAY.** A dark coloured, recent lake deposit; at Pocahontas on the south side of the river, Jasper Park, Alta.

83–D–E½ (Anal. ?) Ser. No. *1914–20*

H. Ries (1914, p. 44)

541. **SOAP CLAY.** Beds 6 to 8 inches thick, immediately above the coal seam, Edmonton, Alta.

83–H–W½ (Anal. G.C. Hoffmann) Ser. No. *1873–1*

Pale, greenish grey clay that works into a lather-like soap, and has a consistency of soft dough.

B.J. Harrington (1874a, p. 64)

542. **DOLOMITE.** Lot 9, rge. 9, Sutton tp., Brome co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1857–2*

Grey, granular dolomite, which contains, in some parts of the bed, thickly disseminated octahedral crystals of magnetic iron with chlorite, and which weathers brownish black from the presence of a large proportion of manganese.

T.S. Hunt (1858, p. 204)

543. **DOLOMITE MAGNESITE.** Forming a low point about 100 to 200 feet wide and several hundred feet long on the east shore of Papineau or Commandant

	538	539	540	541	542
SiO_2	48.58	42.14	40.07	36.48	
Al_2O_3	14.10	3.72	12.11	13.48	
Fe_2O_3	4.94	1.47	4.80		
FeO		13.29		1.80	
MgO	4.82	0.72	2.60	0.66	
CaO	9.38	17.80	15.54	2.03	
Na_2O	1.67		4.38		
K_2O	2.78				
H_2O+		2.60			
H_2O-		0.30	18.95[1]	44.32	
TiO_2		0.54	0.50		
P_2O_5		13.01			
MnO		0.46			
CO_2		5.08			
ignition loss	13.57				
insoluble					21.40
$FeCO_3$					10.65
$MgCO_3$					40.10
$CaCO_3$					20.20
$MnCO_3$					7.65
Total	99.84	101.13	98.95	98.78 (98.77)	100.00
Sp. gr.		2.72			

[1] Including CO_2

Lake, and projecting northward between a small bay and the main expanse of the lake, lot 9, rge. 11, Grenville tp. and addition, Argenteuil co., Que.

31–G–E½ (Anal. H.A. Leverin) Ser. No. *1917–4*

Serpentinized, dolomitic magnesite.

M.E. Wilson (1917, p. 60)

544. **DOLOMITE.** Near Tchiatang Bluff on the northeast side of the narrows leading to Chief's Bay, Lake Nipigon, Thunder Bay district, Ont.

52–H–W½ (Anal. F.G. Wait) Ser. No. *1900–5*

Greenish, fine-textured, argillaceous dolomite in beds from 3 to 12 inches thick.

G.C. Hoffmann (1903, p. 27)

545. **DOLOMITE.** Walkerton, Brant tp., Bruce co., Ont.

41–A–W½ (Anal. F.G. Wait) Ser. No. *1900–24*

Faintly brownish, grey-green, very finely crystalline, almost compact dolomite, containing a very small quantity of ferrous carbonate.

G.C. Hoffmann (1903, p. 27)

546. **DOLOMITE.** Laurentian Series; lot 13, rge. 8, Madoc tp., Hastings co., Ont.

31–C–W½ (Anal. T.S. Hunt) Ser. No. *1853–3*

Greyish-white, almost compact rock of conchoidal fracture containing veins and disseminated grains of quartz.

T.S. Hunt (1857a, p. 367)

547. **DOLOMITE.** Laurentian Series; lot 1, rge. 6, Sheffield tp., Lennox and Addington co., Ont.

31–C–W½ (Anal. T.S. Hunt) Ser. No. *1853–1*

Nearly pure dolomite containing very little quartz and mica. White cleavage faces present diagonal striae.

T.S. Hunt (1857a, p. 367)

	543	544	545	546	547
$FeCO_3$				1.24	0.24
$MgCO_3$	63.66	27.9	42.10	40.17	45.97
$CaCO_3$	36.60	24.7	54.96	46.47	52.57
$CaSO_4$			1.96		
insoluble	0.10	40.0	1.00	12.16	0.60
Total	100.36	92.60	100.02	100.04	99.38
Sp. gr.				2.849	2.684

548. **DOLOMITE.** Laurentian Series; lot 10, rge. 4, Aldfield tp., Pontiac co., Que.

31–F–E½ (Anal. R.A.A. Johnston) Ser. No. *1888–2*

Coarsely crystalline, white dolomite, containing here and there a few grains of honey-yellow chondrodite.

G.C. Hoffmann (1890, p. 27)

549. **DOLOMITE.** Martindale's gypsum quarry at Oneida, Haldimand co., Ont.

30–L–W½ (Anal. Delesse) Ser. No. *1863–12*

Dark grey, earthy, argillaceous dolomite.

Geological Survey (1863, p. 625)

550. **DOLOMITE.** Near the Ottawa River, at the rear of Barrie tp., Frontenac co., Ont.

31–C–E½ (Anal. T.S. Hunt) Ser. No. *1845–1*

Fine-grained, white dolomite.

T.S. Hunt (1847, p. 124)

551. **DOLOMITE.** Guelph Formation; Priest's quarry, on the bank of the Speed River, Guelph tp., Wellington co., Ont.

40–P–E½ (Anal. F.G. Wait) Ser. No. *1895–5*

A light cream-yellow, yellowish brown weathering, very finely crystalline, compact dolomite.

G.C. Hoffmann (1897, p. 17)

	548[1]	549	550	551[1]	552[1]
Al_2O_3	0.11			trace	trace
H_2O (total)		3.84			
H_2O-	(0.05)			(0.02)	(0.10)
insoluble	0.21	22.10		0.03	0.30
$FeCO_3$	0.17			0.16	0.58
$MgCO_3$	46.01	34.15	45.90	45.37	45.45
$CaCO_3$	53.60	39.91	53.90	53.97	54.12
$MnCO_3$	0.14				
$CaSO_4$				0.68	0.17
Total	100.24	100.00	99.80	100.21	100.62

[1] Dried at 100° C

552. **DOLOMITE.** Niagara Formation; from a quarry at Christie's Siding, west half of lot 3, con. 6, Nassagaweya tp., Halton co., Ont.

40–P–E½ (Anal. F.G. Wait) Ser. No. *1895–7*

A light, bluish grey, finely crystalline, massive dolomite.

G.C. Hoffmann (1897, p. 17)

553. **DOLOMITE.** South shore of Table Lake, east of Amisk Lake, about 50 miles north of the Saskatchewan River, Sask.

63–L–E½ (Anal. H.A. Leverin) Ser. No. *1918–5*

Thin-bedded, fine-grained, semi-crystalline, buff dolomite, weathering to a darker buff and consisting of interlocking grains of calcite with a few larger ones due to recrystallization.

E.L. Bruce (1918, p. 46)

554. **DOLOMITE.** Guelph Formation; Wellington quarry, south half of lot 29, Puslinch tp., Wellington co., Ont.

40–P–E½ (Anal. F.G. Wait) Ser. No. *1895–6*

A light grey, finely crystalline, massive dolomite.

G.C. Hoffmann (1897, p. 17)

	553	554[1]	555	556	557[1]
SiO_2			13.46	18.89	0.37
Al_2O_3	0.03	trace	1.56	0.49	0.21
Fe_2O_3	1.07		1.05	0.72	
FeO			0.48		
MgO			17.81	16.79	
CaO			25.08	23.86	
Na_2O			0.28	0.47	
K_2O			1.08	0.57	
H_2O+			1.23	1.57	
H_2O-		(0.05)	0.04	0.18	(0.27)
TiO_2					
P_2O_5					
MnO					
CO_2			38.08	36.89	
insoluble	1.80	0.08			11.02
$FeCO_3$		0.22			0.69
$MgCO_3$	44.14	45.17			39.63
$CaCO_3$	52.85	54.25			48.07
$CaSO_4$		0.34			.10
Total	99.89	100.06	100.15	100.43	100.09
Sp.gr.			2.805	2.802	

[1] Dried at 100° C

555. **MAGNESIAN LIMESTONE.** Lowest member of the Altyn Formation, overlying the Waterton dolomite; at the 5,050-foot contour on the spur running southwest from the right-angled bend in Oil Creek, on the south side of the creek 1 mile below Oil City, Alta.

82–H–W½ (Anal. M. Dittrich) Ser. No. *1912–24*

A very homogeneous, compact, thin-bedded limestone, in which the carbonate occurs in an exceedingly fine-textured aggregate of closely packed, anhedral, colourless grains. A few minute, angular grains of quartz and unstriated feldspar and some dustlike black particles are embedded in the mass. Laminae are bound by sensibly plane surfaces. This bedding lamination is brought out by small differences of grain among the layers.

R.A. Daly (1912, p. 58) *See also* Nos. 556, 571, 582 *(1912–25, 26, 23)*

556. **MAGNESIAN LIMESTONE.** Middle member of the Altyn Formation; low cliffs, 400 yards east of the derrick at Oil City, Alta.

82–H–W½ (Anal. M. Dittrich) Ser. No. *1912–25*

Massive and pale grey arenaceous dolomite; glassy, wind worn or water worn, rounded to subangular quartz and feldspar grains stand out on weathered surfaces. The carbonate forms a compact aggregate of anhedral grains in which are embedded round grains of chalcedonic or cherty silica of clastic origin. Oolite grains with poorly developed concentric and radial structure are embedded.

R.A. Daly (1912, p. 60) *See also* Nos. 555,571 *(1912–24, 26)*

557. **DOLOMITE.** 9-foot band of Clinton Formation; Limehouse, Esquesing tp., Halton co., Ont.

30–M–W½ (Anal. F.G. Wait) Ser. No. *1895–4*

A bluish grey, yellowish brown weathering, very finely crystalline, compact dolomite in beds varying 3 to 7 inches in width.

G.C. Hoffmann (1897, p. 16)

558. **DOLOMITE.** Lockport Formation; Haney's quarry, near Meldrum Bay, Manitoulin Island, Ont.

41–G–W½ (Anal. Mines Branch) Ser. No. *1919–14*

Light grey, or blue, semi-crystalline to fine-grained compact magnesian limestone containing cavities and pore spaces.

M.Y. Williams (1919, p. 113)

559. **DOLOMITE.** Near Rivière a la Graisse, at the Quebec-Ontario boundary, Rigaud tp., Vaudreuil co., Que.

31–G–E½ (Anal. B.J. Harrington) Ser. No. *1874–3*

Hard, rusty-weathering dolomite.
Insoluble portion consisted of: SiO_2 76.34%, Al_2O_3 and Fe_2O_3 14.74%, MgO 7.99%, CaO 1.02%, total = 100.09%.

B.J. Harrington (1876, p. 311)

560. **DOLOMITE.** Sheppard Formation; at the head of Starvation Creek, Clarke and Lewis Ranges, B.C.

82–G–E½ (Anal. M. Dittrich) Ser. No. *1912–30*

Colour, compactness and general habit are those of an impure, flaggy quartzite. It consists of a very finely granular, homogeneous mass of carbonate grains enclosed in a fine-grained base of anhedral carbonate, quartz, sericite, and probably feldspar fragments of minute size. The base also carries a considerable amount of colourless, nearly isotropic material.

R.A. Daly (1912, p. 78)

561. **DOLOMITE.** East side of Amisk Lake, approximately 50 miles north of the Saskatchewan River, Sask.

63–L–E½ (Anal. H.A. Leverin) Ser. No. *1918–7*

Blotchy, variegated dolomite with red coloured patches that fade out into a buff-coloured groundmass.

E.L. Bruce (1918, p. 46)

	558	559	560	561
SiO_2	0.56		24.61	
Al_2O_3	0.20	3.56	6.84	0.26
Fe_2O_3	0.41		0.58	0.80
FeO			2.01	
MgO	21.55		13.34	
CaO	30.50		19.14	
Na_2O	0.05		0.62	
K_2O			2.07	
H_2O+			1.76	
H_2O-			0.24	
TiO_2				
P_2O_5				
MnO				
CO_2	47.40		28.89	
SO_3	0.23			
insoluble		23.54		1.36
$MgCO_3$		32.85		43.14
$CaCO_3$		39.91		53.21
Total	100.90	99.86	100.10	98.77
Sp.gr.			2.779	

562. **DOLOMITE.** Lot 16, con. 6, Ross tp., Renfrew co., Ont.

31–F–E½ (Anal. F.G. Wait) Ser. No. *1899–3*

A beautiful, white, translucent, coarsely crystalline dolomite.

G.C. Hoffmann (1901, p. 35)

563. **DOLOMITE.** Near Cape Dauphin, Cape Breton Island, N.S.

11–K–W½ (Anal. G.C. Hoffmann) Ser. No. *1873–2*

Coarsely crystalline, massive, white, vitreous, and showing here and there blue specks of pyrite. Insoluble portion consisted of: SiO_2 0.56%, MgO 0.49%, CaO 0.05%, Al_2O_3 0.30%, FeO 0.07%, H_2O 0.15%, total = 1.62%.

C. Robb (1874, p. 175)

564. **DOLOMITE.** Overlying banded or striped limestone; lot 22, rge. 8, Lanark tp., Lanark co., Ont.

31–F–E½ (Anal. G.C. Hoffmann) Ser. No. *1874–2*

Brown weathering, crystalline, coarse-grained rock abounding in tremolite. Fresh fracture surfaces vary from a pure white to a flesh-red colour. The tremolite occurs in interstratified layers or beds.

H.C. Vennor (1876, p. 141)

	562[1]	563	564	565	566
SiO_2	0.17				5.84
Al_2O_3	0.09				0.80
Fe_2O_3				1.32	0.79
FeO		0.31			0.16
MgO		20.75			19.38
CaO		30.42			28.31
Na_2O					0.27
K_2O					0.09
H_2O+		0.07			0.63
H_2O-	(0.03)	0.27			0.03
MnO		0.16			
CO_2					43.55
Cl		0.04			
insoluble	0.19	1.55	5.78	7.10	
$FeCO_3$	0.11		0.80		
$MgCO_3$	44.54		42.10	34.66	
$CaCO_3$	55.32		52.12	57.37	
$MnCO_3$	trace				
$Ca_3(PO_4)_2$	0.02				
H_2CO_3		46.44			
H_2SO_4		1.04			
Total	100.44	101.05	100.80	100.45	99.85
Sp.gr.		2.853		2.834	2.822

[1] Dried at 100° C

565. **DOLOMITE.** Laurentian Series; Madoc, Hastings co., Ont.

31–C–W½ (Anal. T.S. Hunt) Ser. No. *1853–4*

Reddish granular dolomite, containing quartz and a little iron oxide to which it owes its colour.

T.S. Hunt (1857a, p. 368)

566. **DOLOMITE.** Alternating with quartzites and phyllitic, and coarser, mica schists; Priest River Terrane, divide between Priest River and Summit Creek, B.C.

82–F–E½ (Anal. M. Dittrich) Ser. No. *1912–41*

Thick and persistent bands of very homogeneous, fine-grained, marble-like, white to pale blue dolomite, transected by numerous veinlets of white quartz. Very compact dolomite. Carbonate occurs as granular aggregates, grains being uniform in size, and averaging about 0.08 mm. It is thoroughly recrystallized and has a structure of true marble. The granular dolomite is interrupted by a few small grains of glass-clear quartz and feldspar.

R.A. Daly (1912, p. 262)

567. **DOLOMITE.** Niagara Formation; Dundas, Wentworth co., Ont.

31–M–W½ (Anal. B.J. Harrington) Ser. No. *1876–3*

Brownish grey, compact and rather earthy dolomite.

B.J. Harrington (1878, p. 487)

568. **DOLOMITE.** Lockport Formation; Providence Bay, Manitoulin Island, Manitoulin co., Ont.

41–G–E½ (Anal. Mines Branch) Ser. No. *1919–12*

Light grey or blue, semicrystalline to fine-grained, compact magnesian limestone, containing cavities and pore spaces.

M.Y. Williams (1919, p. 113)

569. **DOLOMITE.** An outlier of Palaeozoic (probably Ordovician) dolomite; from the long point that extends northward into Limestone Point Lake, Man.

63–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1948–2*

Greatly contorted rock, which may represent a down-faulted block.

No recognizable fossils were found. *See also* No. 573 *(1948–1)*

(J.M. Harrison)

570. **LIMESTONE.** Sec. 17, Crozier tp., about 6 miles west of Fort Frances, Rainy River district, Ont.

52–C–W½ (Anal. N.L. Turner) Ser. No. *1913–40*

Cream-coloured fossiliferous limestone which emerges from beneath the glacial drift mantling the region.

A.C. Lawson (1913, p. 111)

571. **MAGNESIAN LIMESTONE.** Upper member of the Altyn Formation; from the 7,300-foot contour on the back of the ridge, south of Oil City, Alta.

82–H–W½ (Anal. M. Dittrich) Ser. No. *1912–26*

A thin-bedded siliceous dolomite, strongly charged with water worn, clastic grains of quartz and feldspar. The feldspars were microperthite, microcline, orthoclase, and rarely plagioclase. A few oolite-like grains of carbonate, a number of round grains of chert, and a few small specks of magnetite are found in a general carbonate base.

R.A. Daly (1912, p. 61) *See also* Nos. 555, 556 *(1912–24, 25)*

	567	568	569	570	571
SiO_2				4.48	25.50
Al_2O_3		0.12	1.18	2.80	2.25
Fe_2O_3		0.07			0.62
FeO					0.38
MgO			20.06	20.29	14.77
CaO			29.58	29.84	21.65
Na_2O					0.86
K_2O					1.27
H_2O+			1.22		0.42
H_2O-					0.12
TiO_2					
P_2O_5					
MnO					
CO_2			43.60	41.76	32.03
ignition loss				0.04[1]	
insoluble	5.88	3.50	4.56		
$FeCO_3$	0.62	0.24			
$MgCO_3$	41.65	42.55			
$CaCO_3$	51.85	53.48			
Total	100.00	99.96	100.20	99.21	99.87
Sp.gr.					2.768

[1] Water

572. **LIMESTONE.** Aiken Lake, B.C.

94–C–W½ (Anal. R.J.C. Fabry) Ser. No. *1947–6*

(J.E. Armstrong)

573. **DOLOMITE.** An outlier of Palaeozoic, probably Ordovician dolomite; from the long point that extends northward into Limestone Point Lake, Man.

63–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1948–1*

Greatly contorted rock which may represent a down-faulted block. No recognizable fossils were found.

(J.M. Harrison) *See also* No. 569 (*1948–2*)

574. **DOLOMITE.** Laurentian Formation; lot 27, rge. 9, Barrie tp., Frontenac co., Ont.

31–C–W½ (Anal. R.A.A. Johnston) Ser. No. *1888–3*

Very fine crystalline, pure white dolomite.

G.C. Hoffmann (1890, p. 27)

	572	573	574[1]	575	576
SiO_2				30.96	26.07
Al_2O_3				11.19	3.92
Fe_2O_3	0.94	1.20			2.08
FeO					2.68
MgO	19.58	20.30		11.36	12.99
CaO	29.00	30.10		17.13	19.58
Na_2O					1.04
K_2O					1.40
H_2O+	0.92	0.50	(0.07[2])	1.64	1.52
H_2O-				0.55	0.04
TiO_2					
P_2O_5					
MnO					
CO_2	42.66	45.64		26.84	29.14
insoluble	7.34	2.34	2.52		
$FeCO_3$			0.64		
$MgCO_3$			42.63		
$CaCO_3$			54.02		
Total	100.44	100.08	99.81	99.67	100.46
Sp.gr.					2.816

[1] Dried at 100° C

[2] Not included in total

575. **DOLOMITE.** Lying horizontally and unconformably upon the Archaean gneisses; from between Gurney and Mazokama, Nipigon Bay, Lake Superior, Ont.

42–D–W½ (Anal. ?) Ser. No. *1909–3*

Brick-red dolomite with some narrow black and grey layers.

W.H. Collins (1909, p. 16)

576. **MAGNESIAN LIMESTONE.** Upper Altyn Formation; Box Canyon, 6 miles due west of Hefty Ridge, in the MacDonald Range, B.C.

82–G–E½ (Anal. M. Dittrich) Ser. No. *1912–27*

Fairly homogeneous but very thin bedded siliceous rock. Always compact and relatively hard, yet very fissile due to the thin bedding. Layers vary from 1 cm to 10 cm in thickness. Slightly grey or greenish grey in colour, weathering buff and bright brownish yellow. The main mass of the rock is a very compact carbonate in grains from 0.005 mm to 0.03 mm. Angular particles of quartz are abundant in some layers. The accessory constituents are orthoclase or microcline and microperthite (in minute angular particles) and sericitic mica (in small shreddy foils).

R.A. Daly (1912, p. 99)

577. **DOLOMITE.** Southwest bay of Athapapuskow Lake, 50 miles north of the Saskatchewan River, Sask.

63–K–W½ (Anal. H.A. Leverin) Ser. No. *1918–6*

Red dolomite, showing small particles of hematite included in, and filling in between, the calcite crystals.

E.L. Bruce (1918, p. 46)

578. **DOLOMITE.** Walkerton, Brant tp., Bruce co., Ont.

41–A–W½ (Anal. F.G. Wait) Ser. No. *1900–4*

Faintly brownish light grey, very finely crystalline, almost compact dolomite intersected by numerous thin laminae of gypsum.

G.C. Hoffmann (1903, p. 27)

579. **DOLOMITE.** Lockport Formation; Kelso, Nassagaweya tp., Halton co., Ont.

30–M–W½ (Anal. Mines Branch) Ser. No. *1919–15*

M.Y. Williams (1919, p. 113)

580. **DOLOMITE.** Interstratified in a great series of shales and sandstones stretching along the south shore of the Gulf of St. Lawrence, from Little Métis, Rimouski co., Que.

22–C–E½ (Anal. B.J. Harrington) Ser. No. *1876–4*

Fine-grained, brownish grey dolomite, breaking with a conchoidal fracture. Much of it is traversed by minute veins of white calcite.

B.J. Harrington (1878, p. 487)

581. **DOLOMITE.** The upper, massive bed, about 24 feet thick, of the uppermost dolomite of the upper Windsor member; Glendyer Brook, Inverness co., Cape Breton Island, N.S.

11–K–W½ (Anal. F.G. Wait) Ser. No. *1935–34*

A porous, brown dolomite underlain by a lower 8-foot bed of well bedded, oolitic dolomitic limestone.

G.W.H. Norman (1935, p. 40) *See also* No. 609 (*1935–37*)

	577	578	579	580	581
SiO_2					0.57
Al_2O_3	0.39		0.15		0.10
Fe_2O_3	3.11		0.14		0.84
FeO					
MgO					20.08
CaO					31.83
Na_2O					
K_2O					
H_2O+					
H_2O-					
TiO_2					
P_2O_5					
MnO					
CO_2					47.09
insoluble	3.80	1.00	1.24	35.46	
$FeCO_3$			0.82	4.67	
$MgCO_3$	40.04	42.10	42.28	26.40	
$CaCO_3$	51.96	54.96	55.30	35.46	
$CaSO_4$		1.96			
Total	99.30	100.02	99.93	98.72 (101.99)	100.51

582. **DOLOMITE.** Waterton Formation, conformably overlain by the Altyn limestone; in the cliff forming the falls from Oil Creek into Waterton Lake, Alta.

82–H–W½ (Anal. M. Dittrich) Ser. No. *1912–23*

Exceptionally strong, massive, dark grey carbonate rock, weathering dark grey to brownish grey, sometimes buff. About 200 feet thick. It is largely composed of carbonate grains which are very small and sometimes knit in a thorough, interlocking manner; more often they assume the rhombohedral form. In many of the laminae the minute rhombohedra are embedded in a compound, colourless to pale brownish base composed mainly of minute, anhedral glass-clear grains of orthoclase and quartz, which also contain abundant black, opaque carbon. Some laminae are specially charged with roundish clumps and lenses of minute, interlocked orthoclase crystals.

R.A. Daly (1912, p. 53)

583. **DOLOMITE.** Irondequoit Formation; Hamilton, Wentworth co., Ont.

30–M–W½ (Anal. Mines Branch) Ser. No. *1919–7*

Light grey or buff, thick-bedded, tough, crystalline dolomitic limestone. Reef structure is common in places.

M.Y. Williams (1919, p. 111)

584. **DOLOMITE.** In beds about 23 feet above DeCew beds, St. Davids, Niagara tp., Lincoln co., Ont.

30–M–W½ (Anal. Mines Branch) Ser. No. *1919–16*

M.Y. Williams (1919, p. 113)

585. **LIMESTONE.** Sec. 17, Crozier tp., about 6 miles west of Fort Frances, Rainy River district, Ont.

52–C–W½ (Anal. C.A. Graves) Ser. No. *1913–41*

	582	583	584	585 (a)	585 (b)
SiO_2	30.46			3.18	2.93
Al_2O_3	6.86	0.39	0.29	1.43	1.02
Fe_2O_3	4.53	trace	0.57	1.73	2.13
FeO	1.89				
MgO	10.07			18.14	18.14
CaO	16.02			29.76	29.80
Na_2O	0.38[1]				
K_2O	5.77				
H_2O+	1.31				
H_2O-	0.11				
CO_2	22.55				
S				nil	trace
P				trace	trace
ignition less				45.49	46.02
insoluble		4.24	3.00		
$FeCO_3$		2.38	1.66		
$MgCO_3$		39.19	39.00		
$CaCO_3$		53.69	54.28		
Total	99.95	99.89	98.80	99.73	100.04
Sp.gr.	2.749				

[1] Averages of four determinations

Cream-coloured fossiliferous limestone which emerges from beneath the glacial drift mantling the region.
(a) and (b) are two analyses of the same sample.

A.C. Lawson (1913, p. 111)

586. **DOLOMITE.** In small lenticular masses or in layers of a few lines interposed in masses of limestone among the travertines and the fossiliferous limestones on the Island of Orleans, Que.

21–L–W½ or E½ (Anal. T.S. Hunt) Ser. No. *1856–8*

Granular in texture, containing a mixture of clay or sand, grey within, and weathered reddish or yellowish brown without.

T.S. Hunt (1857c, p. 465)

587. **DOLOMITE.** Reynales (Wolcott) Formation; Hamilton, Wentworth co., Ont.

30–M–W½ (Anal. Mines Branch) Ser. No. *1919–6*

Dark grey, fine-grained, dolomitic limestone.

M.Y. Williams (1919, p. 111)

588. **DOLOMITIC LIMESTONE.** From the Poshkokagan River, a stream flowing into Chief's Bay, Lake Nipigon, Thunder Bay, Ont.

52–H–W½ (Anal. F.G. Wait) Ser. No. *1920–25*

Argillaceous dolomitic limestone with the prevailing colour white or yellowish white. Some beds contain a number of semi-translucent nodules which in places have the appearance of fossils. The rock appears to weather easily and forms a grey white clay.

G.C. Hoffmann (1903, p. 27)

589. **DOLOMITE.** Laurentian Series; lot 4, rge. 10, Loughborough tp., Frontenac co., Ont.

31–C–E½ (Anal. T.S. Hunt) Ser. No. *1853–2*

White, reddish weathering, coarsely crystalline dolomite containing quartz and serpentine.

T.S. Hunt (1857a, p. 366)

	586	587	588	589	590
Al_2O_3		0.50			3.42
Fe_2O_3		0.07		traces	0.07
insoluble	13.80	10.90	21.	7.10	32.38
$FeCO_3$	10.31	2.11			3.14
$MgCO_3$	31.81	35.28	31.7	37.11	23.95
$CaCO_3$	45.06	50.85	47.	55.79	38.39
Total	100.98	99.71	99.7	100.00	101.35

590. **DOLOMITE.** Thought to represent the southern extension of the Manitoulin dolomite; Niagara Gorge, above Lewiston, Niagara tp., Lincoln co., Ont.

30–M–W½ (Anal. Mines Branch) Ser. No. *1919–2*

M.Y. Williams (1919, p. 110)

591. **LIMESTONE.** Chazy Formation; southwestern side of Hemlock Lake, Gloucester tp., Carleton co., Ont.

31–G–W½ (Anal. R.A.A. Johnston) Ser. No. *1898–10*

A very fine grained, compact, greenish grey massive limestones weathering yellowish brown and reddish brown.

G.C. Hoffmann (1900, p. 19)

592. **DOLOMITE.** In lenticular masses, or in layers of a few lines, interposed in masses of limestone among the travertines and fossiliferous limestones in the lime quarries near the church of St. Joseph, Pointe Lévis, Lévis co., south shore of the St. Lawrence River, Que.

21–L–W½ (Anal. T.S. Hunt) Ser. No. *1856–7*

Granular in texture, containing a mixture of clay or sand, greyish within, and weathering reddish or yellowish brown without.

T.S. Hunt (1857c, p. 465)

593. **DOLOMITE.** Lockport Formation; Ryan's Quarry, near Meldrum Bay, Manitoulin Island, Ont.

41–G–W½ (Anal. Mines Branch) Ser. No. *1919–13*

Light grey or blue, semicrystalline to fine-grained compact magnesian limestone containing cavities with coarse faces.

M.Y. Williams (1919, p. 113)

594. **LIMESTONE.** Siyeh Formation, conformably overlying Grinnell argillite, and capped by Purcell lava; cliffs of Sawtooth Ridge, 1.5 miles east of lower Kintla Lake, Lewis Range, B.C.

82–G–E½ (Anal. M. Dittrich) Ser. No. *1912–28*

Exceedingly massive, heavily bedded, dark blue or greyish rock, weathering buff, and occasionally containing argillaceous layers. Light grey to bluish grey segregations of calcite in the form of roundish nodules and pencils. Flat lenses or irregular stringers occur through the buff weathered dolomitic base and give it a variegated appearance. Where the calcite is intermingled with argillaceous patches in folds, a 'molartooth' structure is formed. The calcite of the segregations forms a compact aggregate of polygonal, sometimes interlocking grains, seldom showing crystalline form. A few minute cubes of pyrite may be embedded in the mosaic. The main part of the rock is a decided pale yellowish grey and of mixed composition. Anhedra and rhombohedra of dolomite form more than one-half of the volume and are embedded in a base that is partly composed of anhedral granules of dolomite, a few minute angular grains of quartz and feldspar, and a few dust-like particles of carbon and pyrite, all in an amorphous to subcrystalline cement which apparently carries the silica and alumina, and the combined water.

R.A. Daly (1912, p. 75)

595. **LIMESTONE**. Middle Bruce Limestone; Quirke Lake, tp. 144, Algoma district, Ont.

41–J–E½ (Anal. H.A. Leverin) Ser. No. *1925–2*

Thin-bedded, finely crystalline limestone practically devoid of any silty impurities.

W.H. Collins (1925, p. 50)

	591[1]	592	593	594	595
SiO_2	0.60		0.40	35.58	) 28.79
Al_2O_3	0.75		trace	3.40	)
Fe_2O_3	0.27		0.50	1.56	) 1.61
FeO	1.71			0.87	)
MgO	10.55		21.11	10.09	11.68
CaO	19.78		30.84	19.72	25.12
Na_2O			) 0.15	0.51	
K_2O			)	1.21	
H_2O+	(0.98)			2.93	
H_2O-	0.20			0.17	
P_2O_5	0.14[2]				
MnO	0.38				
CO_2	26.03		47.40	23.80	32.61
S					0.43
SO_3	0.07		0.09		
C				0.03	
ignition loss			0.18		
insoluble	38.81	8.80			
$FeCO_3$		5.80			
$MgCO_3$		31.96			
$CaCO_3$		53.04			
Total	99.29	99.60	100.67	99.87	99.88 (100.24)
Sp.gr.				2.741	

[1]Dried at 100°C
[2]Reported as P_2O_3 (?).

596. **DOLOMITE.** Niagara Formation; in beds 1 foot to 3 feet thick, Grimsby, Lincoln co., Ont.

30–M–W½ (Anal. B.J. Harrington) Ser. No. *1876–2*

Crystalline, brownish grey, fossiliferous rock having a pitted appearance with a plane surface.

B.J. Harrington (1878, p. 487)

597. **LIMESTONE.** Lockport Formation; lot 6, con. 11, Dymond tp., Timiskaming district, Ont.

31–M–W½ (Anal. ?) Ser. No. *1925–7*

G.S. Hume (1925, p. 58)

598. **LIMESTONE.** Siyeh Formation; middle member, just west of Phillips Creek Cascade near Roosville Post Office, MacDonald Range, B.C.

82–G–E½ (Anal. M. Dittrich) Ser. No. *1912–29*

Dark grey, argillaceous magnesian limestone or dolomite in massive beds with typical molar-tooth structure. Occasional intercalations of meta-argillite. The individual beds vary in thickness from a fraction of an inch to 2 feet or more, but generally they are grouped or cemented

	596	597	598(a)	598(b)	599
SiO_2		2.96	36.64	36.97	
Al_2O_3			4.24	7.59	0.73
Fe_2O_3		) 1.87	0.99	1.82	0.06
FeO			0.57	1.12	
MgO		10.86	4.38	8.38	
CaO		31.98	25.79	16.28	
Na_2O			0.49	1.04	
K_2O			0.88	2.48	
H_2O+			1.87	3.11	
H_2O-			0.22	0.24	
TiO_2					
P_2O_5					
MnO					
CO_2		51.85	24.31	21.11	
C				0.08	
insoluble	0.50				10.70
$FeCO_3$	1.10				1.05
$MgCO_3$	29.48				20.54
$CaCO_3$	68.92				66.00
Total	100.00	99.52	100.38	100.22	99.08
Sp.gr.			2.748	2.748	

together in massive plates 3 to 10 feet thick. Calcitic partings in lenses and pencils give it the molar-tooth structure, and are made up of aggregated granules of calcium carbonate. Magnesium parts consist of pale brownish, often rhombohedral crystals of dolomite distributed through an abundant matrix of quartz, feldspar, sericite, chlorite, and a thin cloud of black dust particles, partly magnetite and partly carbon. The matrix is very fine grained.

(a) and (b) are two analyses of the same sample.

R.A. Daly (1912, p. 106)

599. **DOLOMITE.** Manitoulin Formation; Mitchell's Mine, lot 8, con. XI, Collingwood tp., Grey co., Ont.

41–A–E½ (Anal. Mines Branch) Ser. No. *1919–4*

M.Y. Williams (1919, p. 110)

600. **LIMESTONE.** Nepean, near Ottawa, Ont.

31–G–W½ (Anal. T.S. Hunt) Ser. No. *1863–17*

Argillaceous magnesian limestone, containing geodes.

Geological Survey (1863, p. 619)

601. **LIMESTONE.** Quarry on lot 34, con. A of Ottawa Front, Nepean tp., Carleton co., Ont.

31–G–W½ (Anal. F.G. Wait) Ser. No. *1900–6*

Bluish grey for the most part, very fine crystalline limestone. Analysis of the insoluble portion gave: SiO_2 14.98%, Al_2O_3 and Fe_2O_3 3.70%, CaO trace, MgO 0.30%, alkalies 1.03%, total 20.01%.

G.C. Hoffmann (1903, p. 26)

602. **LIMESTONE.** Lot 21, rge. 10, Lanark tp., Lanark co., Ont.

31–F–E½ (Anal. G.C. Hoffmann) Ser. No. *1874–13*

Bluish grey bands of dolomitic limestone, coloured by graphite disseminated through it, and containing crystals of tremolite and small grains of glassy quartz. Bluish grey bands alternate with layers of white limestone, sharply defined and varying in thickness and arrangement. The rock weathers a light brown and is coarse grained. The grains are not very coherent.

H.C. Vennor (1876, pp. 141 and 313)

603. **LIMESTONE.** Laurentian Series; lot 4, rge. 5, Madoc tp., Hastings co., Ont.

31–C–W½ (Anal. T.S. Hunt) Ser. No. *1853–5*

Fine-grained, greyish white magnesian limestone. Very siliceous and containing a portion of carbonate of iron.

T.S. Hunt (1857a, p. 367)

604. **DOLOMITE.** Selkirk, Man.

62–I–E½ (Anal. F.D. Adams) Ser. No. *1882–4*

White with a faint greyish or brownish tinge with many patches of a light brown, presenting a blotched appearance. Close texture.
G.C. Hoffmann (1884, p. 1)

	600	601[1]	602	603	604
SiO_2		0.51		32.00[2]	0.03
Al_2O_3		0.20			0.30
Fe_2O_3	12.52				
FeO					
H_2O & loss	9.64				
H_2O^-		(0.16)			
graphite			0.16		
insoluble	19.77	20.01	1.26		0.91
$FeCO_3$		1.61	0.78	4.71	
$MgCO_3$	12.77	16.17	20.57	11.39	16.92
$CaCO_3$	45.30	60.45	77.39	51.90	82.61
$MnCO_3$		trace			
$Ca_3(PO_4)_2$		0.41			
$CaSO_4$		0.37			
Total	100.00	99.73	100.16	100.00	100.77
Sp.gr.				2.757	2.7025

[1] Dried at 100°C
[2] Equal to quartz

605. **LIMESTONE.** Peace River, Alta.

84–?–? (Anal. B.J. Harrington) Ser. No. *1876–14*

Earthy, impure carbonaceous limestone, containing fossils such as fragments of *Monotis*. Dark grey.

B.J. Harrington (1878, p. 485)

606. **LIMESTONE.** From the 13th bed about 3 inches thick in the quarry on lot 8, con. 1, Colborne tp., Huron co., Ont.

40–P–W½ (Anal. F.G. Wait) Ser. No. *1899–16*

A yellowish brown, finely crystalline, dolomitic limestone.

G.C. Hoffmann (1901, p. 34)

607. **LIMESTONE.** White Lake, near Renfrew, Renfrew co., Ont.

31–F–E½ (Anal. R.J.C. Fabry) Ser. No. *1935–19*

(E.M. Kindle)

608. **LIMESTONE.** Liskeard Formation; Farr's quarry, west of Haileybury, Timiskaming district, Ont.

31–M–W½ (Anal. ?) Ser. No. *1925–6*

A compact dark grey limestone, the uppermost member of the formation.

G.S. Hume (1925, p. 58)

609. **DOLOMITIC LIMESTONE.** The lower bed, about 8 feet thick, of the uppermost dolomite of the upper Windsor Member; Glendyer Brook, Inverness co., Cape Breton Island, N.S.

11–K–W½ (Anal. F.G. Wait) Ser. No. *1935–37*

Well-bedded, oolitic dolomitic limestone containing numerous pelecypod valves scattered throughout with their convex surfaces uppermost. These valves are replaced by dolomite and because of their light grey colour stand out against the darker grey of the surrounding limestone. Rhombs of dolomite occur between or partly replace the oolitic structures in the limestone.

G.W.H. Norman (1935, p. 40) *See also* No. 581 (*1935–34*)

610. **LIMESTONE.** From a point near the southern limit of the large ankerite body on Monarch Mountain, B.C.

104–N–W½ (Anal. R.J.C. Fabry) Ser. No. *1953–2*

	605	606	607	608	609
SiO_2		0.02		5.06	0.24
Al_2O_3		0.11		0.87	0.23
Fe_2O_3					0.61
FeO					
$(Fe,Al)_2O_3$			0.34		
MgO			7.41	5.90	6.20
CaO			48.24	44.81	48.09
H_2O			0.62		
MnO			0.01		
CO_2			40.40	42.40	44.60
C			0.52		
organic	1.16[1]	0.08			
insoluble	51.13	2.57	2.85		
$FeCO_3$	1.14	0.72			
$MgCO_3$	7.59	15.06			
$CaCO_3$	38.98	81.75			
$MnCO_3$		trace			
Total	100.00	100.31	100.39	99.04	99.97
Sp.gr.	2.67				

[1] Including H_2O and loss

Grey weathering, grey-white, fine-grained limestone from thin interbeds in black chert. This is believed to be the material replaced by the ankerite.

(J.D. Aitken) *See also* No. 547 (*1953–1*)

611. **LIMESTONE.** A band of magnesian limestone 75 feet thick within ordinary limestone; shoreline of Blubber Bay, north end of Texada Island, B.C.

92–F–E½ (Anal. H.A. Leverin) Ser. No. *1914–28*

Light to dark bluish grey, fine-grained rock. The beds are heavy, undulating in easy rolls, bedding planes are often obscure, and strong, nearly vertical jointage planes constitute the principal partings.

R.G. McConnell (1914b, p. 98) *See also* No. 666 (*1914–27*)

612. **LIMESTONE.** Peace River, Alta.

84–?–? (Anal. B.J. Harrington) Ser. No. *1876–14*

Impure carbonaceous limestone, containing fossils such as fragments of *Monotis;* blackish grey.

B.J. Harrington (1878, p. 485)

613. **LIMESTONE.** Lot 22, rge. 3, Wickham, Drummond co., Que.

31–H–E½ (Anal. B.J. Harrington) Ser. No. *1874–7*

Blackish grey, carbonaceous rock having a somewhat conchoidal fracture.

B.J. Harrington (1876, p. 311)

	610	611	612	613	614
SiO_2	3.35			15.95	
Al_2O_3		) 2.16		3.85	
Fe_2O_3					
FeO	) 0.62				
MgO	5.52				
CaO	45.85				
MnO	0.03				
CO_2	43.06				
H_2O, loss and C			2.57		
insoluble		1.26	42.26		0.90
$FeCO_3$			0.85	3.02	0.51
$MgCO_3$		11.32	5.85	6.77	8.32
$CaCO_3$		85.00	48.47	70.53	90.38
Total	98.43	99.74	100.00	100.12	100.11
Sp.gr.			2.67		

614. **LIMESTONE.** Lot 21, rge. 10, Lanark tp., Lanark co., Ont.

31–F–E½ (Anal. G.C. Hoffmann) Ser. No. *1874–9*

White magnesian limestone with a vitreous lustre. Through it are disseminated very small grains of glassy quartz and tremolite. alternating in sharply defined layers of varying thickness and arrangement with light bluish grey limestone. The rock is coarse grained and weathers light brown.

H.C. Vennor (1876, pp. 141 and 313) *See also* No. 602 (*1874–13*)

615. **LIMESTONE·** From the northeast side of Swanell River Valley, west of Orion Creek, 1,200 feet stratigraphically above No. 660, Aiken Lake map-area, B.C.

94–C–W½ (Anal. R.J.C. Fabry) Ser. No. *1947–8*

Banded, pale green and silver buff, sugary, micaceous limestone, containing a multitude of sericite flakes and a few grains of detrital quartz scattered through a sheared, medium-grained, recrystallized calcite matrix.

E.F. Roots (1954, p. 69)

616. **LIMESTONE.** South of the mouth of Schroeder Creek, Slocan map-area, Kootenay district, B.C.

82–F–W½ (Anal. H.A. Leverin) Ser. No. *1934–30*

Dark grey, massive, coarsely crystalline rock containing impurities that form narrow dark bands or disseminated crystals. Small, scattered flakes of graphite are common; garnet and tremolite are locally abundant. Lenticular quartz veins are common and mostly conform with bedding structures. Some of the less pure limestone is schistose and has in places been transformed to dark green amphibolite.

C.E. Cairnes (1934, p. 34)

617. **LIMESTONE.** Uppermost member of the Liskeard Formation; Farr's quarry, just west of Haileybury, Timiskaming district, Ont.

31–M–W½ (Anal. Abitibi Power and Paper Company) Ser. No. *1925–6*

A compact, dark grey limestone.

G.S. Hume (1925, p. 58)

618. **LIMESTONE.** Lots 9 and 10, rge. 6, Ramsay tp., Lanark co., Ont.

31–F–E½ (Anal. R.A.A. Johnston) Ser. No. *1888–6*

Coarsely crystalline, white Laurentian limestone containing an occasional grain of pale yellow chondrodite and here and there a scale of graphite.

G.C. Hoffmann (1890, p. 25)

619. **LIMESTONE.** Laurentian limestone; lot 24, rge. 9, Ramsay tp., Lanark co., Ont.

31–F–E½ (Anal. R.A.A. Johnston) Ser. No. *1888–5*

Somewhat coarsely crystalline, faintly bluish greyish white rock containing here and there a minute grain of pale yellow chondrodite and and numerous small scales of graphite.

G.C. Hoffmann (1890, p. 24)

	615	616	617	618[1]	619[1]
SiO_2			3.63	0.06	0.05
Al_2O_3					0.14
Fe_2O_3	3.86	0.48	1.37		
FeO					
MgO	2.60		3.08		
CaO	38.42		49.19		
H_2O+	1.88				
H_2O-				(0.09)	(0.07)
CO_2	31.64		42.73		
insoluble	22.34	2.91		3.26	1.13
$FeCO_3$				0.42	0.41
$MgCO_3$		6.81		6.51	6.61
$CaCO_3$		89.28		90.05	91.63
Total	100.74	99.48	100.00	100.30	99.97

[1] Dried at 100° C

620. **LIMESTONE.** Quarry on lot 8, con. 1, Colborne tp., Huron co., Ont.

40–P–W½ (Anal. F.G. Wait) Ser. No. *1899–16*

A light yellowish brown, fine to moderately coarse crystalline, somewhat magnesian limestone.

G.C. Hoffmann (1901, p. 34)

621. **LIMESTONE.** White Lake, near Renfrew, Renfrew co., Ont.

31–F–E½ (Anal. R.J.C. Fabry) Ser. No. *1935–20*

(E.M. Kindle)

622. **LIMESTONE.** Quarry at the north end of Tunnel Mountain, Alta.

82–N–E½ (Anal. F.G. Wait) Ser. No. *1898–12*

A dark grey, compact, massive limestone.

G.C. Hoffmann (1900, p. 20)

623. **LIMESTONE.** From the property of the Texada Development Company, Blubber Bay, north end of Texada Island, B.C.

92–F–E½ (Anal. J. Wanselm) Ser. No. *1914–29*

Light to dark bluish grey, fine-grained rock, breaking with a splintery fracture. It occurs in heavy beds undulating in easy rolls. The bedding planes are often obscure, and strong, nearly vertical, jointage planes constitute the principal partings.

R.G. McConnell (1914b, p. 99)

624. **LIMESTONE.** North side of the pass followed by the old trail from Moricetown to Hankin's camp, on the Zymoetz River, not far from the summit, Bulkley Valley, B.C.

93–L–W½ (Anal. ?) Ser. No. *1908–1*

W.W. Leach (1909, p. 45)

	620[1]	621	622[1]	623	624
SiO_2	0.02		0.03	0.11	
Al_2O_3	0.06	0.38	0.02	0.03	1.30
FeO_3					
FeO				0.23	
MgO		2.95		2.20	
CaO		51.60		53.32	
H_2O		0.37			
H_2O-	(0.03)		(0.04)		
MnO	trace[2]	trace		0.14	
CO_2		44.19			
S				0.05	
P				0.01	
ignition loss				44.01	
organic	0.05	nil	0.16		
insoluble	1.74	1.28	1.05		1.31
$FeCO_3$	0.48		0.08		
$MgCO_3$	6.22		5.40		3.63
$CaCO_3$	91.46		93.77		92.41
$CaSO_4$			0.07		
Total	100.03	100.77	100.58	100.10	98.65

[1] Dried at 100° C
[2] As $MnCO_3$

625. **LIMESTONE.** From the south slope of Lookout Hill near the shore of Delkluz Lake, Aiken Lake map-area, B.C.

94–C–W½ (Anal. R.J.C. Fabry) Ser. No. *1947–10*

Compact, fine-grained, finely bedded, grey crystalline limestone.

E.F. Roots (1954, p. 69)

626. **LIMESTONE.** Old quarry on Gale's farm, Montreal, Hochelaga co., Que.

31–H–W½ (Anal. R.A.A. Johnston) Ser. No. *1896–11*

A dark grey, for the most part compact, massive limestone. Constituents of the insoluble portion: SiO_2 6.73%, Al_2O_3 1.40%, Fe_2O_3 0.31%, CaO 0.11%, organic 0.56%, total = 9.11%.

G.C. Hoffmann (1898, p. 21)

627. **LIMESTONE.** Near the mouth of Keen (Mansfield) Creek, Slocan map-area, Kootenay district, B.C.

82–F–W½ (Anal. H.A. Leverin) Ser. No. *1934–33*

White dense marble from a wide limestone bed. The beds pinch and swell along their course, and may show every gradation from nearly pure limestone to calcareous quartzites and argillites.

C.E. Cairnes (1934, p. 54)

628. **LIMESTONE.** Sutton Formation; Rosebank Lime Company's quarry, ½ mile west of Esquimalt Harbour, Vancouver Island, B.C.

92–B–W½ (Anal. F.G. Wait) Ser. No. *1912–14*

Crystalline, grey to bluish grey, compact, fine-grained rock which is coarser grained and lighter coloured near contacts with plutonic intrusions. It consists essentially of calcite in small grains, firmly cemented

	625	626[1]	627	628	629[1]
SiO_2		0.14			0.04
Al_2O_3	0.80	0.01	0.15	0.16	0.01
Fe_2O_3			0.15		
FeO					
MgO	1.68		1.46		
CaO	52.24		53.40		
H_2O	0.88				
H_2O-		(0.34)			(0.06)
P_2O_5			0.07		
CO_2	42.04				
S+P				trace	
SO_3			0.25		
ignition loss			43.00		
organic					0.27
insoluble	2.72	9.11	0.64	1.95	1.30
$FeCO_3$		0.50			0.31
$MgCO_3$		2.79		2.85	2.77
$CaCO_3$		87.11		95.35	95.57
$MnCO_3$					trace
$CaSO_4$		0.02			
Total	100.36	99.68	99.12	100.31	100.27

[1] Dried at 100° C

together. The accessory constituents are small amounts of argillaceous and carbonaceous matter and frequently some pyrite in minute cubical grains. Near contacts with intrusions, pyrite is more abundant, and diopside grains occur where affected by contact metamorphism.

C.H. Clapp (1912, p. 63)

629. **LIMESTONE.** From the quartz bed about 6 inches thick, in the quarry on lot 8, con. 1, Colborne tp., Huron co., Ont.

40–P–W½ (Anal F.G. Wait) Ser. No. *1899–16*

An ashy brown, very finely crystalline, almost compact limestone.

G.C. Hoffmann (1901, p. 34)

630. **LIMESTONE.** St. Laurent de Montreal quarries, Jacques Cartier co., Que.

31–H–W½ (Anal. R.A.A. Johnston) Ser. No. *1896–10*

A somewhat dark grey, fine to moderately coarse crystalline, massive limestone.

G.C. Hoffmann (1898, p. 21)

631. **LIMESTONE.** Birdseye and Black River Formation, Bath Road quarry, Bath Road, Kingston, Frontenac co., Ont.

31–C–E½ (Anal. R.A.A. Johnston) Ser. No. *1888–7*

A compact, somewhat dark bluish grey rock containing some small inclusions of crystalline calcite.

G.C. Hoffmann (1890, p. 26)

632. **LIMESTONE.** From the west side of Swannell River Valley, on the crest of the ridge 3.2 miles northeast of the summit of Mount Lay, Aiken Lake map-area, B.C.

94–C–W½ (Anal. R.J.C. Fabry) Ser. No. *1947–7*

A massive to platy, light pinkish grey, fine-grained, crystalline limestone containing round markings 1 to 3 mm in diameter which resemble algal structures.

E.F. Roots (1954, p. 69)

633. **LIMESTONE.** South of the mouth of Schroeder Creek, Slocan map-area, Kootenay district, B.C.

82–F–W½ (Anal. H.A. Leverin) Ser. No. *1934–30*

Light grey, massive, coarsely crystalline rock containing impurities that form narrow dark bands or disseminated crystals. Small, scattered flakes of graphite are common; garnet and tremolite are locally abundant. Lenticular quartz veins are common and mostly conform with bedding structures. Some of the less pure limestone is schistose and has in places been transformed to dark green amphibolite.

C.E. Cairnes (1934, p. 34)

	630[1]	631[1]	632	633	634[1]
SiO_2	0.03	0.12			0.12
Al_2O_3	0.01	0.14			
Fe_2O_3			0.92	0.56	
FeO					
MgO			1.20		
CaO			50.58		
H_2O+			1.38		
H_2O-	(0.16)	(0.16)			(0.12)
CO_2			41.06		
organic	0.15	0.27			0.28
insoluble	1.66	7.46	5.16	0.52	2.90
$FeCO_3$	0.47	0.26			0.29
$MgCO_3$	2.75	2.52		2.50	2.33
$CaCO_3$	95.03	90.07		96.07	94.81
Total	100.10	100.84	100.30	99.65	100.73

[1] Dried at 100°C

634. **LIMESTONE.** Birdseye and Black River Formation, Wolfe Island quarry, Wolfe Island, opposite Kingston Harbour, Frontenac co., Ont.

31–C–E½ (Anal. R.A.A. Johnston) Ser. No. *1888–8*

Compact, dark brownish grey rock, traversed by an occasional very thin seam of crystalline calcite.

G.C. Hoffmann (1890, p. 26)

635. **LIMESTONE.** From the 3rd bed, thickness 1 foot 3 inches, Wright's quarry, ward No. 1, Hull, Hull co., Que.

31–G–W½ (Anal. R.A.A. Johnston) Ser. No. *1892–16*

Somewhat finely crystalline, bluish grey limestone.

G.C. Hoffmann (1895, p. 34)

636. **LIMESTONE.** Marshall ridge close to the wagon road, Bridge River district, B.C.

92–J–E½ (Anal. Mines Branch) Ser. No. *1916–9*

C.W. Drysdale (1917, p. 53)

637. **LIMESTONE.** From the 5th bed, 2 inches thick, Wright's quarry, ward No. 1, Hull, Hull co., Que.

31–G–W½ (Anal. R.A.A. Johnston) Ser. No. *1892–16*

Finely crystalline, bluish grey rock.

G.C. Hoffmann (1895, p. 34)

638. **SHALE.** From a 30-foot bed of shale, capped with 6 feet of calcareous loam, Leary Pit, southeast of Winnipeg, Man.

62–H–E½ (Anal. M.F. Connor) Ser. No. *1912–22*

Scattered through the shale are flakes of gypsum and concretions, some 2 to 3 feet in diameter and 1 foot thick.

H. Ries (1912, p. 47)

639. **LIMESTONE.** From the 10th bed, 1 foot 6 inches thick, Wright's quarry, ward No. 1, Hull, Hull co., Que.

31–G–W½ (Anal. R.A.A. Johnston) Ser. No. *1892–16*

Somewhat coarsely crystalline, faintly brownish, ash grey rock.

G.C. Hoffmann (1895, p. 34)

	635[1]	636	637[1]	638	639[1]
insoluble					
SiO_2	1.33	0.46	1.74	20.67	2.06
Al_2O_3		0.23		8.70	
Fe_2O_3		0.17		3.14	
MgO				0.50	
CaO				33.23	
Na_2O				1.20	
K_2O					
H_2O+				28.77[2]	
H_2O-	(0.09)		(0.07)	2.30[2]	(0.08)
CO_2					
SO_3				0.49	
organic				0.63	
$FeCO_3$	0.32		0.26		0.25
$MgCO_3$	2.18	1.83	1.72		1.59
$CaCO_3$	96.25	96.73	96.19		96.92
Total	100.08	99.42	99.91	99.63	100.82

[1] Dried at 100° C

[2] CP_2 included in H_2O+ value

640. **LIMESTONE.** From the 2-foot thick uppermost bed, Wright's quarry, ward No. 1, Hull, Hull co., Que.

31–G–W½ (Anal. R.A.A. Johnston) Ser. No. *1892–16*

Somewhat finely crystalline, faintly brownish, ash grey rock.

G.C. Hoffmann (1895, p. 34)

641. **LIMESTONE.** Ste. Rosalie, near St. Hyacinthe, Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1863–19*

Coarser grained limestone penetrated by seams of shale and grains of pyrite.

Geological Survey (1863, p. 621)

642. **LIMESTONE.** L'Etang Peninsula, about 5 miles south of St. George, on the St. John-St. Stephen Canadian Pacific Railway line, Charlotte co.. N.B.

21–G–E½ (Anal. H.A. Leverin) Ser. No. *1925–9*

Dark grey, non-slaty, bedded limestone cut by a series of dykes and sills. The only other impurities are minute flakes of carbonaceous material. The three analyses are of 10-foot continuous samples taken across the bedding and represent a width of 400 feet.

W.L. Uglow (1927, p. 135)

	640[1]	641	642 (a)[2]	642 (b)[2]	642 (c)[2]
insoluble		22.00	2.90	4.06	2.20
SiO_2	0.67				
Al_2O_3			0.86	0.81	0.53
Fe_2O_3			0.44	0.49	0.37
FeO and Al_2O_3		1.50			
H_2O-	(0.14)				
$FeCO_3$	0.16				
$MgCO_3$	1.38	1.00	1.17	1.12	0.88
$CaCO_3$	97.66	75.60	94.82	93.98	96.53
Total	99.87	100.10	100.19	100.46	100.51

[1] Dried at 100° C
[2] Dried at 105° C

643. **LIMESTONE.** Trenton Formation; quarry of H. Robillard and Son, on lot 22, con. 1, Ottawa Front, Gloucester tp., Carleton co., Ont.

31–G–W½ (Anal. F.G. Wait) Ser. No. *1899–15*

Moderately finely crystalline, dark grey stone from the first bed 18 to 24 inches thick.

G.C. Hoffmann (1901, p. 32)

644. **LIMESTONE.** Upper end of an island near the head of Long Rapids, Abitibi River, Cochrane district, Ont.

42–I–W½ (Anal. Mines Branch) Ser. No. *1924–36*

30 feet of drab, rather soft limestone in 6- to 18-inch bands.
Fossils are abundant.

W. Malcolm (1926, p. 96)

645. **LIMESTONE.** Upper end of an island near the head of Long Rapids, Abitibi River, Cochrane district, Ont.

42–I–W½ (Anal. Mines Branch) Ser. No. *1924–35*

30 feet of drab, rather soft limestone in 6- to 18-inch bands. Fossils are abundant.

W. Malcolm (1926, p. 96)

646. **LIMESTONE.** At the head of Coral Rapids, east side of Abitibi River, Cochrane district, Ont.

42–I–W½ (Anal. Mines Branch) Ser. No. *1924–11*

From the uppermost 25 feet of the cliff exposed along the river bank, which consists of massive, buff, soft rock, splitting easily in layers parallel to the bedding. No trace of crystalline structure. Saccharoidal texture. Corals are abundant.

W. Malcolm (1926, p. 96)

647. **LIMESTONE.** Quarry near Kananaskis Station on the Canadian Pacific Railway line, northeast quarter of sec. 25, rge. 9, tp. 24, west of the 5th initial meridian, Alta.

82–O–W½ (Anal. F.G. Wait) Ser. No. *1898–11*

A light greyish, somewhat coarsely crystalline, massive limestone.

G.C. Hoffmann (1900, p. 20)

	643[1]	644[2]	645[2]	646[2]	647[1]
SiO_2	0.05				0.03
Al_2O_3	0.04				0.09
Fe_2O_3		1.10	2.48	1.85	
H_2O-	(0.03)				(0.04)
FeS_2	0.13				
organic	0.08				
insoluble	0.59	2.73	0.74	2.42	0.06
$FeCO_3$					0.05
$MgCO_3$	1.13	1.15	1.11	1.09	1.11
$CaCO_3$	97.87	94.55	95.71	95.46	98.27
$Ca_3(PO_4)_2$	0.39				
$CaSO_4$					0.08
Total	100.28	99.53	100.04	100.82	99.69

[1] Dried at 100°C

[2] Dried at 105°C

648. **LIMESTONE.** Lower carboniferous; McLean's quarry, Lime Brook, Springville, Pictou co., N.S.

11–E–E½ (Anal. F.G. Wait) Ser. No. *1898–7*

A faint purplish grey, compact, massive limestone.

G.C. Hoffmann (1900, p. 18)

649. **LIMESTONE.** Representing a 25- to 30-foot width of L'Etang limestone, L'Etang Peninsula, about 5 miles south of St. George, on the Saint John-St. Stephen Canadian Pacific Railway line, Charlotte co., N.B.

21–G–E½ (Anal. H.A. Leverin) Ser. No. *1925–10*

Pale grey, massive, mottled marble; not markedly bedded.

W.L. Uglow (1927, p. 135)

650. **LIMESTONE.** Middle of the thick limestone member exposed on the crest of the ridge north of Osilinka River, east of Tinakihi Creek, Aiken Lake map-area, B.C.

94–C–W½ (Anal. R.J.C. Fabry) Ser. No. *1947–4*

Pale purple and buff grey, fine-grained, crystalline, poorly bedded limestone.

E.F. Roots (1954, p. 69)

	648[1]	649	650	651	652
SiO_2	0.14				
Al_2O_3	0.19	0.71			0.57
Fe_2O_3		0.29	0.77	0.20	0.33
FeO					
MgO			0.51		
CaO			54.32		
H_2O-			1.58		
H_2O-	(0.08)				
CO_2			41.14		
organic	0.02				
insoluble	1.01	1.20	2.30	1.30	1.60
$FeCO_3$	0.26				
$MgCO_3$	1.09	1.09		1.05	1.00
$CaCO_3$	97.04	97.00		97.65	96.62
$MnCO_3$	0.44				
$CaSO_4$	0.03				
Total	100.22	100.29	100.62	100.20	100.12

[1] Dried at 100°C

651. **LIMESTONE.** Ste. Rosalie, near St. Hyacinthe, Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1863–19*

Fine-grained, almost black rock.

Geological Survey (1863, p. 621)

652. **LIMESTONE.** Representing a 60-foot width of L'Etang limestone, L'Etang Peninsula, 5 miles south of St. George, on the Saint John-Saint Stephen Canadian Pacific Railway line, Charlotte co., N.B.

21–G–E½ (Anal. H.A. Leverin) Ser. No. *1925–10*

White, thinly bedded marble.

W.L. Uglow (1927, p. 135)

653. **LIMESTONE.** From an old limestone quarry, a mile west of Raymond crossing, Shawinigan district, B.C.

92–B–W½ (Anal. H.A. Leverin) Ser. No. *1912–2*

C.H. Clapp (1914, p. 53)

654. **LIMESTONE.** Representing a 80- to 100-foot width of L'Etang limestone, L'Etang Peninsula, 5 miles south of St. George, on the Saint John-Saint Stephen Canadian Pacific Railway line, Charlotte co., N.B.

21–G–E½ (Anal. H.A. Leverin) Ser. No. *1925–10*

W.L. Uglow (1927, p. 135)

655. **LIMESTONE.** Representing a 150-foot width of L'Etang limestone, L'Etang Peninsula, 5 miles south of St. George, on the Saint John-Saint Stephen Canadian Pacific Railway line, Charlotte co., N.B.

21–G–E½ (Anal. H.A. Leverin) Ser. No. *1925–10*

Greyish white, poorly bedded marble, mottled white and grey.

W.L. Uglow (1927, p. 135)

656. **LIMESTONE.** Occurs throughout the syncline at the base of the Windsor Member, overlain by green shale, underlain by local pockets of conglomerate; Elgin Brook, Inverness co., Cape Breton Island, N.S.

11–K–W½ (Anal. F.G. Wait) Ser. No. *1935–32*

Well laminated, fine-grained rock, dove grey in colour with a greenish hue on weathered surfaces. The laminated structure is due to bedding planes closely spaced ¼ cm or less apart, along which the rock tends to break into thin plates. Quartz grains are scattered along bedding planes, giving the rock an arenaceous appearance. Varies in thickness from 25 to 50 feet.

G.W.H. Norman (1935, p. 36)

657. **LIMESTONE.** Lower Carboniferous, quarry at Goat Lake, Chester tp., Lunenburg co. , N.S.

21–A–E½ (Anal. F.G. Wait) Ser. No. *1898–8*

A light to dark grey, compact, massive limestone with occasional minute veinings and small inclusions of white crystalline calcite.

G.C. Hoffmann (1900, p. 18)

	653	654	655	656	657[1]
SiO_2				7.66	0.03
Al_2O_3		0.77	0.75	2.05	0.34
Fe_2O_3	) 2.00	0.53	0.41	0.97	0.34
FeO					
MgO				0.40	
CaO				48.84	
H_2O-					(0.07)
CO_2				38.81	
organic					0.14
insoluble	1.80	4.16	2.10		0.53
$FeCO_3$					0.58
$MgCO_3$	0.96	0.96	0.96		0.92
$CaCO_3$	93.12	93.98	95.91		97.03
$MnCO_3$					0.63
$CaSO_4$					0.07
Total	97.88	100.40	100.13	98.73	100.27

[1] Dried at 100°C

658. **LIMESTONE.** Trenton Formation; from the 5th bed, 12 to 20 inches thick, in the quarry on lot 22, con. 1, Ottawa Front, Gloucester tp., Carleton co., Ont.

31–G–W½ (Anal. F.G. Wait) Ser. No. *1899–15*

Somewhat coarsely crystalline, faintly brownish, light grey rock.

G. C. Hoffmann (1901, p. 33)

659. **LIMESTONE.** Laurentian limestone; Stetson's quarry, Indiantown, Saint John, Saint John co., N.B.

21–G–E½ (Anal. F.G. Wait) Ser. No. *1895–9*

A light and dark bluish grey, banded, somewhat coarsely crystalline, massive limestone.

G.C. Hoffmann (1897, p. 15)

660. **LIMESTONE.** From the northeast side of Swannell River Valley, west of Orion Creek, 400 feet stratigraphically above the top of the main limestone member, and 4,100 feet above the base of Ingenika Group, Aiken Lake map-area, B.C.

94–C–W½ (Anal. R.J.C. Fabry) Ser. No. *1947–9*

Ivory buff to rose-yellow, crystalline limestone. Poorly bedded to slaty with very fine sericitic and chloritic partings.

E.F. Roots (1954, p. 69)

661. **LIMESTONE.** From the unit comprising the highest beds of the upper member of the Devonian Flume Formation; on the east side of the trail leading down into Job Creek from Coral Creek and Job Creek Pass, about 29 miles west-southwest of Nordegg (lat. 52°20', long. 116°43'), Alta.

83–C–E½ (Anal. J.A. Maxwell) Ser. No. *1955–24*

Dark brownish grey limestone distinctive in the field owing to its extremely fine grain, thick bedding, fine banding, and total lack of megafossils. Remarkably dense, possessing no porosity whatsoever. Composed of a closely knit mass of calcite grains, which are elongated with lengths varying between 3 and 18 microns. Most grains are highly irregular. Scattered authigenic fluorite crystals are square in outline and enclose variable amounts of calcite grains. Sections cut at right angles to bedding show fine colour banding with 4 to 8 bands to 1 mm, which are primary

	658[1]	659[1]	660	661	662
SiO_2	0.02	0.09			
Al_2O_3	0.17	0.01	1.08	0.16	2.44
Fe_2O_3					
FeO					
MgO			0.36	0.39	0.34
CaO			49.24	55.13	48.86
H_2O			0.68		0.72
H_2O-	(0.06)	(0.04)			
CO_2			38.78	43.62	39.20
FeS_2	0.04				
organic	0.01	0.02		0.20	
insoluble	0.32	0.14	9.50	0.61	8.50
$FeCO_3$		0.05			
$MgCO_3$	0.90	0.88			
$CaCO_3$	98.68	99.05			
$Ca_3(PO_4)_2$	0.17				
Total	100.31	100.24	99.64	100.11	100.06

[1] Dried at 100°C

depositional features. There are no indications of filaments in the sections though the insoluble residue consists of a mass of very fine, anastomosing filaments, a small amount of clay minerals, and scattered small crystals of fluorite.

W.L. Fry and D.J. McLaren (1959, p. 3)

662. **LIMESTONE.** From the east side of Tenakihi Creek Valley, north of Osilinka River, Aiken Lake map-area, B.C.

94–C–W½ (Anal. R.J.C. Fabry) Ser. No. *1947–5*

Ivory-buff granular limestone containing abundant oriented flakes of muscovite up to 1 mm long.

E.F. Roots (1954, p. 69)

663. **LIMESTONE.** From the 3rd bed, 14 to 20 inches thick, of the Trenton Formation; quarry on lot 22, con. 1, Ottawa Front, Gloucester tp., Carleton co., Ont.

31–G–W½ (Anal. F.G. Wait) Ser. No. *1899–15*

Finely crystalline, light grey limestone.

G.C. Hoffmann (1901, p. 32)

664. **LIMESTONE.** Quarry on Drury Cove on the Kennebecasis River, about 5 miles from its mouth and about ½ mile west of Lawlors Lake, Portland parish, Saint John co., N.B.

21–H–W½ (Anal. F.G. Wait) Ser. No. *1899–14*

A light bluish grey, cryptocrystalline, massive limestone traversed by numerous very fine layers of a yellowish grey earthy mineral.

G.C. Hoffmann (1901, p. 32)

	663[1]	664[1]	665[1]	666	667[1]
SiO_2	0.02	0.03	0.04		0.04
Al_2O_3	0.04	0.01	0.02		0.02
Fe_2O_3				) 0.39	
H_2O-	(0.04)	(0.03)	(0.05)		(0.14)
FeS_2	0.06				
organic	0.04		0.31		0.16
insoluble	0.60	2.68	0.82	0.20	2.77
$FeCO_3$		0.11	0.05		0.26
$MgCO_3$	0.78	0.76	0.71	0.71	0.68
$CaCO_3$	98.25	96.55	98.39	98.39	95.89
$MnCO_3$		trace			
$Ca_3(PO_4)_2$	0.37				
Total	100.16	100.14	100.34	99.60	99.82

[1] Dried at 100°C

665. **LIMESTONE.** Laurentian limestone; Lawlor's Lake, Portland parish, Saint John co., N.B.

21–H–W½ (Anal. F.G. Wait) Ser. No. *1895–10*

A bluish grey, somewhat coarsely crystalline, massive limestone.

G.C. Hoffmann (1897, p. 16)

666. **LIMESTONE.** On the property of the Pacific Lime Company, shore line of Blubber Bay, north end of Texada Island, B.C.

92–F–W½ (Anal. H.A. Leverin) Ser. No. *1914–27*

Nearly pure limestone overlying and underlying a band of magnesian limestone 75 feet thick. Both varieties are light to dark bluish grey, fine-grained, breaking with a splintery fracture. The beds are heavy, undulating in easy rolls, the bedding planes often being obscure, and strong, nearly vertical jointage planes constitute the principal partings.

R.G. McConnell (1914b, p. 98)

667. **LIMESTONE.** Birdseye and Black River Formation; Mallette's quarry, Pointe Claire, Jacques Cartier co., Que.

31–H–W½ (Anal. R.A.A. Johnston) Ser. No. *1888–4*

Compact, very dark brownish grey limestone containing a few inclusions of crystalline calcite and occurring in beds from 10 inches to 4 feet thick.

G.C. Hoffmann (1890, p. 24)

668. **LIMESTONE.** Bonaventure Formation; west side of Cascapedia River, about 4 miles north of the place where highway 6 crosses the river, Bonaventure co., Gaspé Bay, Que.

22–B–E½ (Anal. ?) Ser. No. *1935–17*

Massive, greyish to reddish limestone containing no fossils and occurring in a thickness of 18 to 20 feet. Locally conglomeratic and at its base grades into red conglomerate.

F.J. Alcock (1935, p. 90)

669. **LIMESTONE.** Lower Carboniferous; quarry at Indian Point, Lunenburg co., N.S.

21–A–E½ (Anal. F.G. Wait) Ser. No. *1898–9*

A somewhat light grey, compact, massive limestone. Here and there are small inclusions of white crystalline calcite.
G.C. Hoffmann (1900, p. 19)

670. **LIMESTONE.** Sutton Formation; south shore of Cowichan Lake, Vancouver Island, B.C.

92–C–E½ (Anal. F.G. Wait) Ser. No. *1912–13*

Crystalline, grey to greyish blue or more rarely white, compact to fine-grained marble, with interstratified fossiliferous beds. Overlain by coral limestone. It consists essentially of calcite in small grains, firmly cemented together. Accessory constituents (often absent), are argillaceous and carbonaceous matter, and pyrite in minute cubical grains.

C.H. Clapp (1912, p. 63)

671. **LIMESTONE.** Laurentian Formation; quarry at Green Head, Saint John River, Saint John co., N.B.

21–G–E½ (Anal. F.G. Wait) Ser. No. *1895–8*

A dark bluish grey, finely crystalline, massive limestone, through which was disseminated an occasional speck of iron pyrite.

G.C. Hoffmann (1897, p. 15)

672. **LIMESTONE.** From the north end of Butler Range, 3 miles due south of the summit of Ingenika Cove, Aiken Lake map-area, B.C.

94–C–W½ (Anal. R.J.C. Fabry) Ser. No. *1947–12*

A light grey, medium-grained, fairly well bedded, crystalline limestone containing beds and streaks of white, slightly more coarsely crystalline, finely bedded material.

E.F. Roots (1954, p. 69)

	668	669[1]	670	671[1]	672
SiO_2	10.42	0.02	1.40	0.16	
Al_2O_3	0.51	0.41		0.11	
Fe_2O_3					0.18
FeO	0.47				
MgO					0.21
CaO					54.82
H_2O					0.70
H_2O-		(0.12)		(0.09)	
CO_2					43.14
S			0.42		
P			0.02		
organic		0.11		0.46	
insoluble		0.49	11.88	3.54	0.76
$FeCO_3$		0.48		0.13	
$MgCO_3$	5.40	0.55	0.42	0.44	
$CaCO_3$	83.48	97.21	86.29	95.60	
$MnCO_3$		0.58			
$CaSO_4$		0.07			
Total	100.28	99.92	100.43	100.44	99.81

[1] Dried at 100°C

673. **LIMESTONE.** Mile-end quarries, Montreal, Hochelaga co., Que.

31–H–W½ (Anal. R.A.A. Johnston) Ser. No. *1896–9*

A light grey, somewhat coarsely crystalline, massive limestone.

G.C. Hoffmann (1898, p. 20)

674. **LIMESTONE.** Near the summit of Lookout Hill, Aiken Lake map-area, B.C.

94–C–W½ (Anal. R.J.C. Fabry) Ser. No. *1947–11*

A white, moderately coarse-grained, recrystallized, bedded limestone.

E.F. Roots (1954, p. 69)

675. **LIMESTONE.** Pinchi Fault Zone; on the ridge to the west of Bralorne Takla Mercury Mine, Takla Lake, B.C.

93–N–W½ (Anal. R.J.C. Fabry) Ser. No. *1944–5*

A normal blue-grey, grey weathering, medium-grained to dense limestone. In some areas completely recrystallized so evidence of bedding is lost. Stylolitic structures were observed. Chert occurs along original bedding planes or in white weathering nodules. Many bands are iron stained and most are crisscrossed with calcite stringers. Some bands contain argillaceous material and some are dolomitic.

J.E. Armstrong (1949, p. 36)

	673[1]	674	675	676	677
SiO_2	0.04		0.09		
Al_2O_3	0.02				0.66
Fe_2O_3		0.60	0.20	0.03	
FeO					
MgO		0.20	0.20		
CaO		55.30	55.67		
Na_2O			0.31		
K_2O					
H_2O		0.86			
H_2O-	(0.14)				
CO_2		42.66			
organic	0.07				
insoluble	1.05	0.50	0.58	0.10	9.12
$FeCO_3$	0.19				
$MgCO_3$	0.42		(0.42)	0.39	0.35
$CaCO_3$	97.68		(99.37)	99.23	89.25
Total	99.47	100.12	99.79[2]	99.72 (99.75)	99.38

[1]Dried at 100°C
[2]Carbonates only

676. **LIMESTONE.** The Gisby Group along the Nahatlatch River; between the 2nd and 3rd talcose belts above the railway bridge, Yale district, B.C.

92–H–W½ (Anal. M.F. Connor) Ser. No. *1926–17*

Finely crystalline, dark coloured limestone, from sedimentary strata which all contain carbonate minerals in proportions varying from a small percentage to limestone beds composed of nearly pure calcite. The talc bodies of the Gisby Group are secondary products of these strata.

M.E. Wilson (1926, p. 46)

677. **LIMESTONE.** 8-foot bed close to the Golden Star Mine, Rainy Lake area, Rainy River district, Ont.

52–C–E½ (Anal. H.A. Leverin) Ser. No. *1913–50*

Grey, medium-grained crystalline limestone, with scattered crystals of brown mica. Discontinuous bands of chert are in its midst, and in parts of the formation numerous small angular fragments of chert project above the weathered surface.

A.C. Lawson (1913, p. 44)

678. **LIMESTONE.** East shore of Lake Ainslie, near the Lake Ainslie postoffice, Inverness co., Cape Breton Island, N.S.

11–K–W½ (Anal. R.J.C. Fabry) Ser. No. *1928–10*

Fine-grained, dove grey rock with a greenish hue on weathered surfaces and a laminated structure due to bedding planes closely spaced ¼ cm or less apart and along which the rock tends to break into thin plates.

Quartz grains scattered along bedding planes give the rock an arenaceous appearance. Overlain by green shale, and underlain by local pockets of conglomerate.

G.W.H. Norman (1935, p. 36)

679. **SHALE.** White Cliff, Ellis Bay, Anticosti Island, Que.

22–H–E½ (Anal. School of Mines of Paris) Ser. No. *1928–18*

A highly calcareous shale, containing a nodular shale of which the large gastropod *Hormotoma gigantea* is characteristic. Formation is about 200 feet thick. Two analyses were made.

W.H. Twenhofel (1928, p. 24)

680. **LIMESTONE.** Resting on a floor of jasperoid rocks, Brooklyn Mine, Phoenix Boundary district, B.C.

82–E–E½ (Anal. F.G. Wait) Ser. No. *1912–16*

Crystalline, massive, extremely fine to medium-grained, pure white to light and dark grey rock containing quartz and pyrite. It consists of clear and turbid grains of calcite in mosaic arrangement, with curved twinning and cleavage planes and uneven extinctions. Aggregates of microcrystalline and chalcedonic quartz are of frequent occurrence and are developed interstitially to the grains of calcite, or tend to replace the calcite along cleavage planes. Pyrite in minute grains and well-formed crystals occur both in the calcite and the quartz.

O.E. LeRoy (1912, p. 34)

	678	679 (a)	679 (b)	680	681 (a)
SiO_2	2.68	20.70	20.80		
Al_2O_3		12.28	7.35		0.46
Fe_2O_3	0.36	2.77	2.36		0.75
MgO	0.04	trace	trace		nil
CaO	53.98	33.20	34.60		51.60
H_2O	0.42				
MnO	0.25				
CO_2	40.99				42.20
SO_3	0.21	0.80	1.30		
ignition loss		31.50	32.60		
insoluble	0.91			10.00	4.60
$FeCO_3$				0.16	
$MgCO_3$				trace	
$CaCO_3$				90.41	
Total	100.19 (99.84)	100.25 (101.25)	100.00 (99.01)	100.57	99.61
Less O ≡ S	0.08 100.11 (99.76)				

681. **LIMESTONE.** Mabou area, Inverness co., Cape Breton Island, N.S.

11–K–W½ (Anal. F.G. Wait) Ser. No. *1935–33*

(a) McKinnon Brook, Mabou Highlands, Inverness co., Cape Breton Island, N.S.

(b) ½ mile northwest of the northeast Mabou post office, Inverness co., Cape Breton Island, N.S.

G.W.H. Norman (1935, p. 36)

682. **LIMESTONE.** Glenmore Brook, near Twin Rock Valley post office, Inverness co., Cape Breton Island, N.S.

11–K–W½ (Anal. F.G. Wait) Ser. No. *1935–31*

Unfossiliferous limestone about 12 to 15 feet thick and closely resembling freshwater *spirorbis*-bearing limestone of surrounding localities.

G.W.H. Norman (1935, p. 29)

683. **LIMESTONE.** Associated Cement Company's quarry, Bamberton, Saanich Inlet, Vancouver Island, B.C.

92–B–W½ (Anal. Associated Cement Co.) Ser. No. *1917–12*

C.H. Clapp (1917, p. 107)

684. **LIMESTONE.** Sutton Formation; Vancouver Portland Cement Company's quarry, Tod Inlet, Vancouver Island, B.C.

92–B–W½ (Anal. A. Neu) Ser. No. *1917–10*

	681 (b)	682	683	684	685
Al_2O_3	0.51	0.74			
Fe_2O_3	0.49	0.86	) 1.60	) 0.8	
MgO	nil	nil			
CaO	53.20	51.80			
CO_2	42.50				
ignition loss		41.90			
insoluble	3.20	4.40	0.80	1.1	1.50
$FeCO_3$					0.31
$MgCO_3$			trace	trace	trace
$CaCO_3$			97.24	97.5	98.40
Total	99.90	99.70	99.64	99.4	100.21

Crystalline, chiefly grey to bluish grey, less commonly white or black, carbonaceous limestone. Varies from compact to medium-grained marble, in places shaly. Frequently brecciated, recemented by calcite veinlets. Consists of calcite, or magnesian calcite, occurring in small grains (sometimes microscopic) that are firmly cemented together. In the metamorphic types the accessories are minor quartz, chlorite, diopside and pyrite.

C.H. Clapp (1917, p. 107)

685. **LIMESTONE.** Rests on the floor of jasperoid rocks, Knob Hill-Ironsides Mine, 300-foot level, Phoenix Boundary district, B.C.

82–E–E½ (Anal. F.G. Wait) Ser. No. *1912–17*

Crystalline, massive, extremely fine to medium-grained rock, pure white to light and dark grey. Consists of clear and turbid grains of calcite in mosaic arrangement with curved twinning and cleavage planes and uneven extinctions. Aggregates of microcrystalline and chalcedonic quartz are of frequent occurrence and are developed interstitially to the grains of calcite or tend to replace the calcite along cleavage planes. Pyrite in minute grains and well-formed crystals occur both in the calcite and the quartz.

O.E. LeRoy (1912, p. 34)

686. **INFUSORIAL EARTH.** Pollet River Lake, Mechanic Settlement, King's co., N.B.

21–H–W½ (Anal. G.C. Hoffmann) Ser. No. *1878–16*

Chalky, very fine grained, harsh feeling, light greyish white material in a deposit about 4 feet deep of freshwater origin. It contains siliceous spicules of *Spongilla* in great abundance, also quantities of frustules of diatomaceae, mostly detached, among which has been recognized the following genera: *Pinnularia, Surirella, Stauroneis and Himantidium.*

G.C. Hoffmann (1880, p. 5)

687. **DIATOMACEOUS EARTH.** 18 miles from Ashcroft, B.C.

92–I–W½ (Anal. M.F. Connor) Ser. No. *1916–6*

C.W. Drysdale (1916, p. 53)

688. **DIATOMACEOUS EARTH.** From the middle bed, 12–15 feet thick, of a deposit of 48 feet of infusorial earth exposed in the thick beds on the steep hill slope 800 feet above the Fraser River and 2 miles southwest of Quesnel, near the southwest corner of lot 906, B.C.

93–B–E½ (Anal. F.W. Baridon) Ser. No. *1920–28*

Exceedingly fine grained, coherent, grey-white to cream-coloured material of exceptionally light weight. Usually composed almost wholly of cylindrical tests from about 0.003 to 0.03 mm. long, and about one quarter as wide. Some samples contained minute impurities that are probably clay, others had quartz grains, and in one was a piece of woody substance.

L. Reinecke (1920, p. 78)

689. **DIATOMACEOUS EARTH.** From the 15-foot thick bed at the base of a deposit of 48 feet of infusorial earth exposed in thick beds on the steep hill slope 800 feet above the Fraser River and 2 miles southwest of Quesnel, near the southwest corner of lot 906, B.C.

93–B–E½ (Anal. F.W. Baridon) Ser. No. *1920–23*

Description same as No. 688

L. Reinecke (1920, p. 78)

690. **DIATOMACEOUS EARTH.** Quesnel, B.C.

93–B–E½ (Anal. J. Keele) Ser. No. *1917–6*

White or greyish, very light, porous material consisting largely of broken fragments of tests of diatoms so small that a very high power of magnification is required to identify them.

C. Camsell (1918, p. 27)

	686[1]	687	688	689	690
SiO_2	80.49	80.40	79.84	76.52	76.16[2]
Al_2O_3	3.15	6.30	7.60	8.63	
Fe_2O_3	0.95	1.42	2.82	3.92	
FeO			0.51	0.69	
MgO	0.28	0.46	1.00	1.12	
CaO	0.34	0.32	0.50	0.53	
Na_2O					
K_2O		0.45	) 0.27	) 0.20	
H_2O+			6.22	6.56	
H_2O-	) 13.32[3]	) 10.00	(6.52)	(6.80)	
TiO_2		0.30			
P_2O_5					
MnO			trace	trace	
CO_2					
H_2CO_3	0.01				
carbonaceous			1.01	1.20	
ignition loss					10.78
residue					13.04
Total	98.54	99.65	99.77	99.37	99.98

[1]Air dried
[2]By difference
[3]Including organic matter

691. **INFUSORIAL EARTH.** Occurs below the surface soil in the wide valley north of Prospect Lake, in Lake district, Vancouver Island, B.C.

92–B–W½ (Anal. H.A. Leverin) Ser. No. *1913–35*

Light grey, uniform in appearance. Consists of siliceous tests of diatoms, largely broken to submicroscopic grains, although many straight, columnar forms are present mixed with a considerable amount of fine argillaceous matter.

C.H. Clapp (1913, p. 138)

692. **DIATOMACEOUS EARTH.** From the top bed, 14 feet thick, of the 48-foot deposit of infusorial earth exposed in thick beds on the steep hill slope 800 feet above the Fraser River and 2 miles southwest of Quesnel, near the southwest corner of lot 906, B.C.

93–B–E½ (Anal. F.W. Baridon) Ser. No. *1920–21*

Exceedingly fine grained, coherent, white, thin-bedded material composed almost wholly of cylindrical tests from about 0.003 to 0.03 mm long and about one quarter as wide. Contains a few leaf remains.

L. Reinecke (1920, p. 78)

693. **GYPSUM.** Tennycape, Hants co., N.S.

11–E–W½ (Anal. Professor Kennedy) Ser. No. *1892–13*

E.R. Faribault (1894, p. 65)

	691	692	693	694	695	696
SiO_2	75.92	70.20				9.04
Al_2O_3	8.23	12.60			1.16	3.07
Fe_2O_3	3.43	4.56	0.37	0.6	1.64	1.27
FeO		0.81			0.29	0.40
MgO	1.28	1.70		trace	1.70	1.37
CaO	1.85	0.85	32.52	31.0	19.80	28.42
Na_2O	1.39	0.60				
K_2O	0.94					
H_2O+	5.40	7.66	20.60		3.10	2.23
H_2O-		(7.97)			10.92	14.75
TiO_2						
P_2O_5						
MnO		trace				
CO_2	1.08				2.60	3.40
SO_3			46.51	42.1	23.50	33.30
carbonaceous		1.06				1.72
ignition loss				21.6		
insoluble			0.44	4.5	35.86	
Total	99.52	100.04	100.44	99.80	100.57	98.97

694. **GYPSUM.** Northwest of Knutsford and about 150 feet above the road, Nicola map-area, Kamloops and Yale districts, B.C.

91–I–E½ (Anal. ?) Ser. No. *1948–6*

Greyish cream in colour due to organic matter. Sometimes a little iron is present.

W.E. Cockfield (1948, p. 144)

695. **GYPSUM.** Forming nodules lying at or just beneath the surface near the main masses of hydromagnesite; Clinton, between the Fraser and the North Thompson Rivers, B.C.

92–P–W½ (Anal. ?) Ser. No. *1920–16*

The nodules lie 2 to 3½ feet from the surface. The nodule from which the sample came was overlain by 6 inches of black soil and consisted of nearly pure gypsum and calcite along its upper border, but in depth these minerals were mixed with gradually increasing amounts of the boulder clay in which the nodule lay.

L. Reinecke (1920, p. 32)

696. **GYPSUM.** Forming nodules lying at or just beneath the surface near the main masses of hydromagnesite; Clinton, between the North Thompson and Fraser Rivers, B.C.

92–P–W½ (Anal. ?) Ser. No. *1920–17*

The nodule from which the sample was taken lies 18 inches from the surface, and is overlain by 6 inches of black soil. It consists of nearly pure gypsum and calcite along its upper border but in depth these minerals are mixed with gradually increasing amounts of boulder clay in which the nodule lies.

L. Reinecke (1920, p. 32)

697. **MARL.** Lake deposit which extends out from the shore beneath the waters of the lake at some points for 100 feet or less, at others for 200 feet or more; White Lake, lots 18 and 19, con. 9, Huntingdon tp., Hastings co., Ont.

31–C–W½ (Anal. F.G. Wait) Ser. No. *1894–37*

The air-dried material is earthy, slightly coherent, and yellowish white. It contains few shells, and no visible root fibres.

G.C. Hoffmann (1896, p. 27)

698. **MARL.** Deposit more than 7 feet deep, covering an area of more than 6 acres, on lot 13, con. 4, Lavant tp., Lanark co., Ont.

31–F–E½ (Anal. F.G. Wait) Ser. No. *1894–34*

The air-dried material is earthy, slightly coherent, and yellowish white. Contains few shells or root fibres.

G.C. Hoffmann (1896, p. 24)

699. MARL. 6- or 7-foot deep deposit, covering an area of upwards of 500 acres, Shallow Lake, Keppel tp., Grey co., Ont.

41–A–W½ (Anal. F.G. Wait) Ser. No. *1894–41*

The air-dried material is earthy, somewhat coherent, and almost white. Contains no visible shell remains or root fibres.

G.C. Hoffmann (1896, p. 30)

	697[1]	698[1]	699[1]	700[1]	701[1]
	soluble	soluble	soluble	soluble	soluble
SiO_2	0.08	0.02	0.08	0.11	0.03
Al_2O_3	0.06	0.10	0.08	0.13	0.03
Fe_2O_3	0.08	0.08	0.16	0.09	0.09
FeO					
MgO	0.11	0.06	1.04	0.13	0.36
CaO	54.47	53.17	52.52	52.24	51.97
Na_2O	trace	0.10		trace	0.08
K_2O	trace			trace	trace
H_2O+					
H_2O-	(0.75)	(0.52)	(0.30)	(0.46)	(0.82)
TiO_2					
P_2O_5					
MnO		0.02	trace		
CO_2					
H_2CO_3	42.87	42.02	42.47	41.16	41.34
H_3PO_4	0.01	0.01	0.01	0.02	0.02
organic	1.84	3.66	2.70	4.90	5.96
insoluble	1.08	0.24	1.74	1.08	0.71
Total	100.63	99.48	100.82	99.86	100.62
	insol.	insol.	insol.	insol.	insol.
SiO_2	0.82	0.15	1.22	0.72	0.48
Al_2O_3 & Fe_2O_3	0.21	0.07	0.32	0.24	0.13
MgO	trace	trace	trace	0.02	0.02
CaO	0.03	0.01	0.03	0.04	0.03
Na_2O & K_2O	0.02	0.01	0.17	0.06	0.05
Total	1.08	0.24	1.74	1.08	0.71

[1]Air dried

700. MARL. Deposit 5 feet thick with unknown extent on the east side of MacKay's or Hemlock Lake, lots 1 and 2 at Gore junction, Gloucester tp., Carleton co., Ont.

31–G–W½ (Anal. F.G. Wait) Ser. No. *1894–33*

The air-dried material is earthy, slightly coherent, yellowish white. Contains numerous shells and root fibres.

G.C. Hoffmann (1896, p. 23)

701. MARL. Deposit of at least 10 feet, extending over an area of 200 acres or more on lots 15 and 16, con. 2, Sheffield tp., Lennox and Addington co., Ont.

31–C–W½ (Anal. F.G. Wait) Ser. No. *1894–35*

The air-dried material is earthy, friable, light grey, and contains numerous shells and some wood fibres.

G.C. Hoffmann (1896, p. 25)

702. MARL. Forms the bottom of the lake and is apparently of considerable thickness, Chalk Lake, lots 1 and 2, con. 1, and lot 1, con. 2, Reach tp., Ontario co., Ont.

30–M–W½ (Anal. F.G. Wait) Ser. No. *1894–36*

The air-dried material is earthy, somewhat coherent, yellowish white, and contains root fibres and some shells.

G.C. Hoffmann (1896, p. 26)

703. MARL. Deposit about 135 yards long and some 74 yards wide, lot 12, con. A, Coulonge Lake Front, Westmeath, Renfrew co., Ont.

31–F–E½ (Anal. F.G. Wait) Ser. No. *1894–38*

The deposit consists of two distinct continuous layers. (a) The upper layer is dark coloured, 22 inches thick. Its air-dried material is earthy, slightly coherent, light grey, and contains some shells and root fibres. (b) The lower layer is 14 inches thick. The air-dried material is earthy, loosely coherent, yellowish white, and contains some shells but no visible root fibres.

G.C. Hoffmann (1896, p. 28)

704. MARL. Deposit of considerable thickness covers the bottom of Marl Lake, at the west end of the Island of Anticosti, Que.

22–H–E½ (Anal. F.G. Wait) Ser. No. *1894–31*

The air-dried material is earthy, somewhat coherent, and greyish white. It contains numerous shells and some root fibres. The lake covers an area of about 90 acres.

G.C. Hoffmann (1896, p. 21)

705. MARL. Deposit extends over an area of 20 acres and is from 30 to 40 feet thick; lot 4, rge. 11, Stanstead tp., Stanstead co., Que.

31–H–E½ (Anal. F.G. Wait) Ser. No. *1894–32*

The air-dried material is earthy, somewhat coherent and yellowish white. It contains a few shells and some root fibres.

G.C. Hoffmann (1896, p. 22)

	702[1]	703 (a)[1,2]	703 (b)[1]	704[1]	705[1]
	soluble	soluble	soluble	soluble	soluble
SiO_2	0.05		0.09	0.07	0.03
Al_2O_3	0.09		0.12	0.02	0.24
Fe_2O_3	0.08		0.09	0.08	0.11
FeO					
MgO	0.07		0.51	0.02	0.10
CaO	51.88	52.31	51.68	50.83	50.65
Na_2O	trace			0.17	trace
K_2O	trace			0.02	trace
H_2O+					
H_2O-	(0.01)	(0.99)	(0.29)	(0.70)	(0.72)
TiO_2					
P_2O_5					
MnO					trace
CO_2					
H_2CO_3	40.86		41.18	40.06	39.73
H_3PO_4	0.01	0.04	0.02	0.02	0.01
H_2SO_4	0.06		0.03	0.15	0.15
organic	4.77	5.27	2.71	5.44	7.17
insoluble	2.11	0.88	4.06	2.88	1.76
Total	99.98	58.50	100.49	99.76	99.95
	insol.	insol.	insol.	insol.	insol.
SiO_2	1.57		2.85	1.99	1.07
Al_2O_3	) 0.38		) 0.82	0.47	) 0.57
Fe_2O_3				0.14	
MgO	0.02		trace	0.03	trace
CaO	0.06		0.14	0.16	0.05
Na_2O & K_2O	0.08		0.25	0.07	0.07
MnO				0.01	
Total	2.11		4.06	2.87	1.76

[1]Air dried

[2]Included because description connected to description of 703 (b)

706. **MARL.** Deposit covers about 12 acres and is at least 7 feet deep, on lot 24, con. 9, Artemesia tp., Grey co., Ont.

41–A–E½ (Anal. F.G. Wait) Ser. No. *1894–40*

The air-dried material is earthy, slightly coherent, yellowish white, and contains a few shells and some root fibres.

G.C. Hoffmann (1896, p. 29)

	706[1]	707[1]	708[1]	709[1]	710[1]
	soluble	soluble	soluble	soluble	soluble
SiO_2	0.21	0.10	0.37		0.33
Al_2O_3	0.28	0.07	0.39	0.03	0.16
Fe_2O_3	0.25	0.08	0.34	0.07	0.29
MgO	0.73	0.04	0.84	1.23	0.76
CaO	48.73	48.32	47.92	45.40	43.71
Na_2O	trace	trace	0.10		trace
K_2O	trace	trace	0.04		trace
MnO	trace	trace	trace		
H_2O-	(0.34)	(1.06)	(0.47)		(0.76)
CO_2			38.65	36.92	
SO_3				trace	
PO_3			0.02	nil	
H_2CO_3	38.99	38.01			34.87
H_3PO_4	0.02	0.02			0.03
H_2SO_4	0.06	0.07			0.34
ignition loss				8.20	
organic	3.30	4.79	1.42		9.79
insoluble	8.30	8.62	9.81	8.40	10.36
Total	100.87	100.12	99.90	100.25	100.64
	insol.	insol.	insol.	insol.	insol.
SiO_2	5.56	6.24	6.97		7.74
Al_2O_3	) 2.17	) 1.51	1.55		1.52
Fe_2O_3			0.48		0.37
MgO	0.04	0.08	0.15		0.08
CaO	0.06	0.29	0.27		0.24
Na_2O	) 0.47	) 0.50	0.20		) 0.41
K_2O			0.19		
TiO_2			traces		
MnO			traces		
BeO			traces		
Total	8.30	8.62	9.81		10.36

[1] Air dried

707. **MARL.** Deposit in Emerald Lake, 5 miles west of Opemicon Narrows, between Mattawa and Timiskaming Lake, Ottawa River, Nipissing distinct, Ont.

31–L–W½ (Anal. F.G. Wait) Ser. No. *1894–42*

The air-dried material is earthy, somewhat coherent, light grey, and contains a few shells and some root fibres.

G.C. Hoffmann (1896, p. 31)

708. **MARL.** Covers the bottom of Marl Lake and is also said to extend over a considerable area of the immediately surrounding land, lots 25 and 26, Flos tp., Simcoe co., Ont.

31–D–W½ (Anal. F.G. Wait) Ser. No. *1900–13*

The air-dried material is earthy, somewhat coherent, light yellowish grey, and contains a few shells and root fibres.

G.C. Hoffmann (1903, p. 28)

709. **MARL.** Covering everything below the surface of the lake, from the first lake west of Betty Lake, Tooms tp., Sudbury district, Ont.

41–O–E½ (Anal. ?) Ser. No. *1929–14*

White.

R.C. Emmons and E. Thomson (1929, p. 28)

710. **MARL.** From a deposit 3 feet thick underlying 3 feet of peat, in the neighbourhood of the Eramosa branch of the Green River, Eramosa tp., Wellington co., Ont

40–P–E½ (Anal. F.G. Wait) Ser. No. *1894–39*

The air-dried material is earthy, friable, light grey, and contains few shells or root fibres.

G.C. Hoffmann (1896, p. 29)

711. **MARL.** From the borders and on the floor of a pond about 100 yards long, well within a swampy area that occurs along the foot of the ridge bounding Pine Creek Valley along the northern side, Atlin Lake area, B.C.

104–N–W½ (Anal. N.L. Turner) Ser. No. *1915–8*

Exceedingly finely granular save for a few large shell fragments.

G.A. Young (1916, p. 60)

712. **MARL.** On the Pikitigouching River, which flows into Lake Nipigon, Ont.

52–I–E½ (Anal. B.J. Harrington) Ser. No. *1874–11*

Indurated, pink calcareous marl, occurs in horizontal beds.

B.J. Harrington (1876, p. 312)

713. **CALCAREOUS SINTER.** Both sides of the valley of Twomile Creek, B.C.

93–M–E½ (Anal. H.A. Leverin) Ser. No. *1912–3*

G.S. Malloch (1914, p. 107)

714. **FRAGMENTAL ROCK.** Fort William, Port Arthur area, Thunder Bay distinct, Ont.

52–A–E½ (Anal. M.F. Connor) Ser. No. *1931–23*

Red, fine-grained, fragmental rock occurring in a variety of phases, the commonest being layers, some a few inches and some several feet thick and showing no internal stratification. It consists of homogeneous soft, brick-red material of earthy texture and sparsely scattered, tiny flakes of mica. Buff-coloured spots, streaks and flame-shaped areas occur occasionally through various parts of the rock.

T.L. Tanton (1931, p. 53)

715. **RED JASPER.** 10-foot bed lying directly on the amygdaloidal surface of the Coronation Canyon Lava flow; Coronation Canyon, west of Stuart Channel, Vancouver Island, B.C.

92–B–W½ (Anal. N.L. Turner) Ser. No. *1917–15*

It is made up almost entirely of quartz, hematite, and magnetite.

C.H. Clapp (1917, p. 141)

	711	712	713	714	715
SiO_2	0.98	39.87		53.99	83.76
Al_2O_3	0.04	) 9.34	) 2.44	14.46	0.61
Fe_2O_3	0.03			9.73	10.73
FeO	0.07			0.85	4.48
MgO	2.52	6.24		3.87	0.34
CaO	48.84	22.40		3.03	0.04
Na_2O				3.53	
K_2O				4.53	
H_2O+	6.01			) 4.37[2]	
H_2O-	(2.52)				) 0.12
TiO_2				1.14	0.17
P_2O_5					
MnO				0.10	0.17
CO_2	41.15				
SO_3			0.01		
insoluble			3.90		
$MgCO_3$			0.06		
$CaCO_3$			90.35		
H_2CO_3		23.40			
Total	99.64	101.25	96.76	99.60	100.42

[1] Dried at 105°C
[2] Including CO_2

716. **OOLITIC HEMATITE.** Series of bands alternating with shales and cross-bedded fine-grained sandstone; Dominion Bed, Wabana Iron Ore, Bell Island, Nfld.

1–N–E½ (Anal. ?) Ser. No. *1915–42*

Reddish brown rock, which breaks readily into parallelopiped-shaped blocks. The breaks are marked by minute veinlets of calcite and quartz forming a reticulating meshwork. The weathered surfaces exhibit a fine granular appearance due to oolitic structure. Contains small fragments of brachiopods and worm burrows. Hematite is intimately associated with chamosite, in the form of spherules and is also found between them. Some secondary siderite occurs. Fragmental quartz forms up to 10% of the ore and is partly replaced by chamosite.

A.O. Hayes (1915, p. 45)

717. **OOLITIC HEMATITE.** Series of bands alternating with shales and cross-bedded fine-grained sandstone; Dominion Bed, Wabana Iron Ore, Bell Island, Nfld.

1–N–E½ (Anal. T.G. McFarlane) Ser. No. *1915–43*

Description same as No. 716

A.O. Hayes (1915, p. 45)

718. **OOLITIC HEMATITE.** 6 inches above the floor of the workable ore, a series of bands alternating with shales and crossbedded, fine-grained sandstone; Scotia Bed, Wabana Iron Ore, Bell Island, Nfld.

1–N–E½ (Anal. A.V. Seaborn) Ser. No. *1915–57*

Reddish brown rock which breaks readily into parallelopiped-shaped blocks. These breaks are marked by minute veinlets of calcite and quartz forming a reticulating meshwork. The weathered surfaces exhibit a fine granular appearance due to oolitic structure. Contains small fragments of brachiopods and worm burrows. Hematite and chamosite form the spherules, hematite being predominant. Siderite is rarely present. Crystalline quartz holding minute crystals of hematite fills the interstices. The edges of the spherules are corroded by their partial replacement by quartz. Interstitial quartz was not found elsewhere in the ores.

A.O. Hayes (1915, p. 45)

719. **OOLITIC HEMATITE.** Lower part of Scotia Bed; location 215 D3, Wabana Iron Ore, Bell Island, Nfld.

1–N–E½ (Anal. A.O. Hayes) Ser. No. *1915–62*

Description same as No. 718

A.O. Hayes (1915, p. 45)

720. **OOLITIC HEMATITE.** Upper part of Scotia Bed, 2 feet below the top of the workable ore; location 206 J 2d5, Wabana Iron Ore, Bell Island, Nfld.

1–N–E½ (Anal. A.V. Seaborn) Ser. No. *1915–59*

Hematite and chamosite form spherules with rare interstitial fragmental quartz. Siderite is abundant replacing much of the chamosite, some hematite, and the quartz. Small aggregates of crystalline galena occur rarely. Reddish brown rock which breaks into parallelopiped-shaped rocks. These breaks are marked by minute veinlets of calcite and quartz forming a reticulating meshwork. The weathered surfaces exhibit a fine granular appearance due to oolitic structure. Small fragments of brachiopods and worm burrows.

A.O. Hayes (1915, p. 52)

	716	717	718	719	720
SiO_2	11.98	12.59	9.85	7.44	4.66
Al_2O_3	5.13	5.71	3.23	9.04	3.05
Fe_2O_3	75.90	75.12	67.79	59.89	52.08
FeO			10.03	16.74	21.17
MgO	0.21	0.42	0.37		1.14
CaO	2.71	1.49	2.42		2.88
Na_2O					
K_2O					
H_2O+	1.86		2.35		1.72
H_2O-		0.52	0.32		0.27
TiO_2		0.27	0.40		0.28
P_2O_5	2.02	1.63	2.26	1.63	2.11
MnO	0.23	0.06			0.78
CO_2			1.05	4.57	10.78
S	0.03	nil			
ignition loss		2.17			
Total	100.07	99.98	100.07	99.31	100.92
Sp.gr.		4.10	4.34		4.23

721. **SANDSTONE.** Lower part of the Scotia Bed; location 215 D1, Wabana Iron Ore, Bell Island, Nfld.

1–N–E½ (Anal. A.O. Hayes) Ser. No. *1915–61*

Dark green, ferruginous, chamositic sandstone, surface shiny when broken parallel to the bedding planes, and composed of very small fragments of detrital quartz and of chamosite, with small shell fragments and carbonaceous material. Spherules are characteristically absent but occur in places. Chamosite occurs as a cement in small microcrystalline-plated crystals, and is also sometimes uncrystallized. It is green and pleochroic.

A.O. Hayes (1915, p. 53)

722. **IRONSTONE.** Nodules in grey sandy clay that is interstratified with bands of lignite; Dirt Hills, Sask.

72–H–W½ (Anal. B.J. Harrington) Ser. No. *1873–19*

The nodules vary from the size of filberts to a diameter of 3 feet. Drab in colour on fresh fractures with dark reddish brown surface, often reticulated by small ridges. Some of the thinner pieces of the ore are perforated by very small cylindrical holes surrounded by oxidized walls.

B.J. Harrington (1874b, p. 241)

723. **IRON OCHRE.** Several feet of constantly forming deposit from ferruginous water; Ste. Anne de Montmorency, Que.

31–M–E½ (Anal. T.S. Hunt) Ser. No. *1852–2*

Yellowish brown, weathering to reddish or purplish brown and becoming greenish below the surface. Earthy in texture.

T.S. Hunt (1854, p. 177)

724. **MAGNETITE-BEARING MUD.** Forms the top of the unconsolidated materials on the bottom of Steep Rock Lake, Thunder Bay district, Ont.

52–B–W½ (Anal. R.J.C. Fabry) Ser. No. *1938–2*

(T.L. Tanton)

	721	722	723	724	725
SiO_2	27.68	7.03	4.75	41.02	27.51
Al_2O_3	9.10	2.31		8.60	5.14
Fe_2O_3	2.39	1.46	59.10	24.14	13.19
FeO	29.80	51.98			1.14
MgO	2.30	0.65		1.83	1.31
CaO	7.19	1.14		2.75	5.10
H_2O^+	3.44	0.53		) 14.12	) 10.80
H_2O^-	0.51	0.85			
TiO_2	0.37				
P_2O_5	4.77				
MnO	1.38	1.18		0.58	
MnO_2					32.66
CO_2	11.54				2.17
FeS_2		0.09			
H_2CO_3		31.85			
H_3PO_4		0.20			
H_2SO_4		0.05			
organic		0.52		6.66	
volatile			36.10		
Total	100.47	99.84	99.95	99.70	99.02

725. **MANGANIFEROUS CONCRETION.** Loughboro Lake, Frontenac co., Ont.

31–C–E½ (Anal. R.J.C. Fabry) Ser. No. *1935–18*

(E.M. Kindle)

726. **CONCHOLITE.** Steep Rock Lake, Thunder Bay district, Ont.

52–B–W½ (Anal. R.J.C. Fabry) Ser. No. *1945–1*

Part of the main body of concholite.

(T.L. Tanton)

727. **COPROLITE.** Allumette Island, Ottawa River, Que.

31–F–W½ (Anal. T.S. Hunt) Ser. No. *1851–4*

Granular, chocolate-brown, rounded, cylindrical and imitative masses sometimes 1 inch in diameter and 2 inches long, found abundantly in a coarse-grained sandstone. The phosphatic paste encloses fragments of *Lingula,* and fills the moulds of *Pleurotomaria.*

T.S. Hunt (1852b, p. 110)

728. **SERPULITES.** Rivière Ouelle, Kamouraska, Que.

21–N–W½ (Anal. T.S. Hunt) Ser. No. *1851–10*

Small, dark brown, hollow, cylindrical masses found in sandstone; appear homogeneous under the microscope, and are encrusted with siliceous sand. They exhibit a yellowish brown translucence in thin layers.

T.S. Hunt (1852b, p. 106)

729. **SERPULITES.** Rivière Ouelle, Kamouraska, Que.

21–N–W½ (Anal. T.S. Hunt) Ser. No. *1851–10*

Rounded, cylindrical and imitative forms of phosphate of lime similar to the composition of No. 728. The interstices are often filled by iron pyrites also found in globular masses in the aggregate. Dark blackish brown, very compact, fine-grained conchoidal fracture.

T.S. Hunt (1852b, p. 106)

730. **IMPURE BEDDED CALCITE.** Interstratified with sand and clay on the flat west of Kelly Lake, Clinton area, B.C.

92–P–W½ (Anal. ?) Ser. No. *1920–15*

L. Reinecke (1920, p. 32)

731. **BEDDED DEPOSITS OF GYPSUM.** Calcite and hydrous magnesium carbonate in the shallow water along the northeast shore of Kelly Lake, Clinton area, B.C.

92–P–W½ (Anal. ?) Ser. No. *1920–14*

L. Reinecke (1920, p. 32)

	726	727	728	729	730	731
insoluble	0.22		21.10	) 25.44	25.26	9.30
SiO_2	2.27	49.90				
Al_2O_3	3.17			) 12.62[1]	0.83	0.28
Fe_2O_3	80.32	7.02[2]			0.80	0.29
FeO	1.36		2.95		0.65	
MgO	0.04				0.77	0.66
CaO	nil				37.14	47.70
Na_2O						
K_2O..............						
H_2O+	) 13.13				3.55	3.72
H_2O-					0.70	0.53
TiO_2.............	nil					
P_2O_5	0.01					
MnO	nil					
CO_2	trace				29.78	36.76
SO_3..............					0.21	0.24
volatile		1.70	2.15	2.13		
$MgCO_3$			1.65	9.70		
$CaCO_3$		5.00	4.35	5.14		
$Ca_3(PO_4)_2$		36.38	67.53	40.34		
Total	100.52	100.00	99.73	95.37	99.67 (99.69)	99.48
Sp.gr.		2.875		3.035 3.151		

[1]Including Mn traces
[2]Including MgO

PARTIAL ANALYSES OF SEDIMENTARY ROCKS

732. **SANDSTONE.** Between zones 1 and 2 of the Wabana Iron Ores, loc. No. 206 A7, from halfway across Bell Island, Nfld.

1–N–E½ (Anal. M.F. Fraser) Ser. No. *1915–41*

SiO_2 76.50%. Al_2O_3 6.05%, Fe_2O_3 2.14%, CaO 0.00%.

A.O. Hayes (1915, p. 45)

733. **SILT.** Deposit occupies a flat plain of between 100 and 200 acres, not more than 10 inches deep, near Black's Harbour, Charlotte co., N.B.

21–G–E½ (Anal. Ledoux, New York) Ser. No. *1897–6*

A fine silt, entirely of sedimentary origin, overlying a darker coloured material of the same nature.
SiO_2 72.65%, Al_2O_3 17.93%, Fe_2O_3 0.57%.

L.W. Bailey (1898, p. 120)

734. **TUFFACEOUS ARGILLITE.** Finlayson Arm, interior Saanich Inlet, Vancouver Island, B.C.

92–B–W½ (Anal. Associated Cement Co.) Ser. No. *1917–13*

Dark grey to black, fine to very fine grained, slaty or massive, homogeneous rock. Tiny angular fragments of quartz, feldspar, sericite, chlorite, and epidote lie in a carbonaceous and argillaceous matrix. Rock is clearly stratified, some layers being coarser grained than others.
SiO_2 67.56%, Al_2O_3 20.54%, Fe_2O_3 8.58%, MgO 2.16% CaO trace.

C.H. Clapp (1917, p. 75)

735. **TALCOSE SHALE OR ARGILLITE.** Sillery Formation; Ste. Marie, Beauce co., Que.

21–L–W½ (Anal. T.S. Hunt) Ser. No. *1854–15*

Very soft, fissile red shale, exfoliating by the action of the weather. It is intersected by veins of quartz and the surfaces are occasionally spotted with scales of a greenish mineral resembling chlorite.
SiO_2 66.70%, Al_2O_3 16.20%, FeO 6.90%, MgO 2.65%, CaO 0.67%, Na_2O and K_2O undetermined; volatile 3.10%.

T.S. Hunt (1857b, p. 385)

736. **CLAY.** Murphy Brook, Middle Musquodoboit River, N.S.

11–E–W½ (Anal. F.H. Mason) Ser. No. *1911–9*

Mottled clay floated from a 15-foot bore-hole.
SiO_2 52.90%; Al_2O_3 29.00%; Fe_2O_3 3.20%; MgO, CaO, alkalies and TiO_2 not determined; loss on ignition 12.10%.

H. Ries (1911, p. 83)

737. **CLAY.** Pit alongside the Grand Trunk Railway, about ½ mile east of Ormstown Station, Chateauguay co., Que.

31–H–W½ (Anal. J. Keele) Ser. No. *1915–21*

Brick clay consisting of massive, blue-grey clay; overlain by grey clay with rusty streaks, and yellowish loamy clay. The rusty grey clay is not stratified, but contains a stratified sandy clay layer.
SiO_2 62.17%; Al_2O_3 19.34%; iron oxides 4.00%; MgO 2.90%; CaO 4.14%; SO_3 0.18%; loss on ignition 4.35%.

J. Keele (1915a, p. 75)

738. **SHALE.** Lorraine Shale, occurring near the surface on a flat area, Mimico, York co., Ont.

30–M–W½ (Anal. L.J. Rogers) Ser. No. *1924–18*

SiO_2 57.60%; Al_2O_3 16.30%; Fe_2O_3 8.00%; MgO 3.97%; CaO 3.47%; Na_2O and K_2O 3.40%;

J. Keele (1924, p. 19)

739. **SHALE.** Occurring halfway up the cliff at the shipping pier of Nova Scotia Steel and Coal Company, location No. 206 A1, south shore of Bell Island, Nfld.

1–N–E½ (Anal. M.L. Fraser) Ser. No. *1915–40*

Sandy shale.
SiO_2 57.00%; Al_2O_3 15.98%; Fe_2O_3 8.83%; CaO nil.

A.O. Hayes (1915, p. 45)

740. **CLAY.** Champlain clay, exposed in a cutting below a sluiceway, at the east end of Sheek Island, Stormont co., Ont.

31–G–E½ (Anal. Mines Branch) Ser. No. *1924–25*

Massive, homogeneous, marine sediment.
(a) Average of upper 8 feet of bank: SiO_2 54.90%; Al_2O_3 18.20%; Fe_2O_3 6.64%; MgO 3.62%; CaO 4.68%; Na_2O 1.36%; K_2O 3.78%; loss on ignition 3.22%.
(b) Average of lower 12 feet of the bank: SiO_2 53.48%; Al_2O_3 18.06%; Fe_2O_3 7.36%; CaO 4.62%; MgO 4.62%; Na_2O 1.75%; K_2O 3.33%; ignition loss 2.76%.

J. Keele (1924, p. 65)

741. **LIMESTONE.** Last Chance mine, Slocan map-area, Kootenay district, B.C.

82–F–W½ (Anal. H.A. Leverin) Ser. No. *1934–34*

Brownish grey, siliceous limestone, which may show every gradation from nearly pure limestone to calcareous quartzites and argillites.
Al_2O_3 and Fe_2O_3 5.22%; MgO 3.41%; CaO 18.34%; insoluble 54.00%.

C.E. Cairnes (1934, p. 54)

742. **SHALE.** From the gypsum quarries at Paris, on the Grand River, Ont.

40–P–E½ (Anal. T.S. Hunt) Ser. No. *1863–41*

A greenish, crumbling, shaly rock.
$CaCO_3$ 25.20%; $MgCO_3$ 19.70%; argillaceous residue 52.20%; water 2.90%.

Geological Survey (1863, p. 625)

743. **SHALE.** Overlying zone 4, Scotia Bed, Wabana Iron Ore, Bell Island, Nfld.

1–N–E½ (Anal. M.L. Fraser) Ser. No. *1915–69*

SiO_2 41.00%; Al_2O_3 18.20%; Fe_2O_3 19.57%.

A.O. Hayes (1915, p. 53)

744. **SANDY SHALE.** Floor of Dominion Bed, Wabana Iron Ore, loc. No. 215 C, Bell Island, Nfld.

1–N–E½ (Anal. A.V. Seaborn) Ser. No. *1915–46*

Consists of alternation of ferruginous sandstone with siliceous shale. The fine-grained sandstone is a mosaic of quartz fragments set in a matrix of uncrystallized and microcrystalline chamosite; many cross-sections of crystalline chamosite are present. Many small shell fragments, generally in long narrow strips, lie parallel to the bedding of the rock. A few spherules of chamosite are scattered through the thin section. The siliceous shale consists largely of extremely fine grained, semi-opaque, dark brown material containing small quartz fragments, chamosite and shell fragments. Many small irregular patches and films of an opaque substance are found.
SiO_2 36.61%; Fe_2O_3 33.18%; CaO 0.00%; P_2O_5 0.08%; S 0.15%.

A.O. Hayes (1915, p. 46)

745. **SHALE.** Loc. No. 215 C7, above the Dominion ore zone, Wabana Iron Ore, Bell Island, Nfld.

1–N–E½ (Anal. A.V. Seaborn) Ser. No. *1915–53*

Brownish black shale with some interlaminated hematite and nodules.
SiO_2 34.48%; Fe_2O_3 37.68%; CaO 0.18%; P_2O_5 0.11%; S 0.01%.

A.O. Hayes (1915, p. 26)

746. **LIMESTONE.** Interstratified with red and green shales and sandstones of Granby, Shefford co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1856–14*

Acid soluble portion: $CaCO_3$ 30.08%; $MgCO_3$ 3.68%; CaO and Al_2O_3 5.45%; MnO 0.58%.
Insoluble residue: SiO_2 53.20%; Al_2O_3 7.90%; FeO 15.75%; MgO 8.79%; TiO_2 6.30%; NiO 0.15%; Cr_2O_3, MnO and loss (?) 2.45%; Na_2O and K_2O 0.66%; loss on ignition 4.80%.

T.S. Hunt (1857c, p. 474)

747. **SHALE.** Chancellor Formation; upper part of the Ice River Valley, on the Ottertail range, Field map-area, B.C.

82–M–E½ (Anal. J. Allan) Ser. No. *1914–21*

Characterized throughout by its remarkable lithological uniformity and by the reddish colour of the weathered outcrops of its upper part. The unaltered part of the series is thin bedded with a slaty cleavage parallel with the stratification plane.
(a) Upper 1,000 feet consist of thin-bedded grey and blue, argillaceous and calcareous meta-argillites with some thin interbedded layers of more highly carbonaceous material. Beds weather brown, yellow, fawn, and buff, the colour depending upon the varying ferruginous content of the beds. The rock is a calcareous and dolomitic shale high in iron. Carbonates 22.6% (MgO > CaO), insoluble residue 74.4% (soluble material consists essentially of alumina, silica, and ferric oxide).
(b) The lower member of the formation is greyish, calcareous shale, meta-argillite and argillites, sometimes even phyllitic in character towards the bottom of the section, weathering greenish, greyish, reddish, yellowish, and buff. The underlying beds contain more carbonates than the upper beds of the formation. There is more magnesia than lime in the carbonates.
Carbonates 36.4%; insoluble residue 63.6%.

J.A. Allan (1914, p. 77)

748. **CONGLOMERATE MATRIX.** St. Helen's Island, Montreal, Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1857–1*

Analysis is of the fine-grained calcareo-siliceous paste of conglomerate made up of pebbles of shale, chert, and sandstone. Part soluble in HCl (46%) consisted of: $FeCO_3$ 25.8%; $MgCO_3$ 16.4%; $CaCO_3$ 57.8%.

T.S. Hunt (1858, p. 201)

749. **CLAY.** Banks of the Rivière a la Graisse, Glengarry co., Ont., or Vaudreuil co., Que.

31–G–E½ (Anal. T.S. Hunt) Ser. No. *1851–2*

(a) Reddish fawn coloured, stratified impalpable clay. Soluble in HCl: CaO 3.97%; MgO 1.92%; Al_2O_3 and Fe_2O_3 12.95%.
Complete decomposition: Al_2O_3 and Fe_2O_3 27.30%; MgO 2.62%; CaO 5.32%; Na_2O 2.06%; K_2O 1.26%; H_2PO_4 0.74%.
(b) A blue clay interstratified with the reddish fawn coloured clay. Soluble in HCl: CaO 2.74%; MgO 2.86%; Al_2O_3 and Fe_2O_3 14.4%.
Complete decomposition: CaO 8.12%; Al_2O_3 13.00%; Fe_2O_3 13.40%.

T.S. Hunt (1852b, p. 100)

750. **SEDIMENTS.** Composite samples of greywackes, slates, arkose, etc., from the Yellowknife Group, opposite the Yellowknife greenstone belt, Burwash shaft, Yellowknife River and Prosperous Lake areas, District of Mackenzie.

85–J–E½ (Anal. J.A. Maxwell) Ser. No. *1954–43*

Specimen No.	Total H_2O	CO_2	Total S
Sed 1	2.57	nil	0.01
Sed 2	1.48	0.02	.01
Sed 3	1.96	.05	.07
Sed 4	1.93	.13	.20
Sed 5	1.36	.16	nil
Sed 6 (1430A)	1.91	.07	.16
Sed 7 (1432A)	1.82	.50	.15
Sed 7 (1433A)	2.72	.11	.14
Sed 8 (932A)	0.94	.08	.22
Sed 9	4.91	.16	.08

(R.W. Boyle)

751. **MAGNESITE DOLOMITE.** Deposit consisting of a group of large boulders situated a few hundred feet east of Calumet Creek, south part of lot 12, rge. 8, Grenville tp., Argenteuil co., Que.

31–G–E½ (Anal. R.A.A. Johnston) Ser. No. *1917–5*

Similar to the bedrock a few hundred feet eastward indicating they have been derived from it.
MgO 4.86%; $MgCO_3$ 66.38%; $CaCO_3$ 23.96%.

M.E. Wilson (1917, p. 60)

752. **DOLOMITE.** DeCew Waterlime beds, Lockport dolomite, Redhill Creek, west of Mount Albion, Barton tp., Wentworth co., Que.

30–M–W½ (Anal. Mines Branch) Ser. No. *1919–11*

Argillaceous, dolomitic, fine-grained, dark grey limestone in a bed 8 to 9 feet thick.
SiO_2 14.48%; Al_2O_3 5.10%; Fe_2O_3 1.26%; FeO 0.67%; MgO 15.96%; CaO 20.29%; H_2O 5.60%.

M.Y. Williams (1919, p. 112)

753. **DOLOMITE.** Exposed in the banks of all the rivers from the Albany to the Kebinakagami Rivers in northern Ont.

(Anal. M.F. Connor) Ser. No. *1909–2*

Very soft argillaceous grey dolomite, associated with brick-red rock of similar character; in places, bands of mottled red and grey rock. Upstream are outcrops of harder buff- to cream-coloured rocks, in places rich in fossils. Specimens representing different phases of rock were analysed.

	753 (a)	753 (b)	753 (c)	753 (d)	753 (e)
SiO_2 and insol.....	4.4	32.2	1.8	36.0	36.0
$MgCO_3$	40.4	27.8	43.2	26.0	27.0
$CaCO_3$	51.7	33.2	52.4	33.1	31.1

W.J. Wilson (1909, p. 9)

754. **LIMESTONE.** Lot 9, rge. 14, McNab tp., Renfrew co., Ont.

31–F–E½ (Anal. B.J. Harrington) Ser. No. *1876–15*

Light brownish grey rock dotted with occasional crystals of white calcite and presenting a mottled appearance when polished.
CaO 53.00%; $MgCO_3$ 43.88%.

B.J. Harrington (1878, p. 486)

755. **DOLOMITE.** Basal part of the Clinton Formation, Dundas, Flamboro tp., Wentworth co., Ont.

30–M–W½ (Anal. Mines Branch) Ser. No. *1919–5*

Sandy rock containing glauconitic layer 2 or 3 inches thick.
SiO_2 22.42%; Al_2O_3 3.46%; Fe_2O_3 2.97%; FeO 2.72%; MgO 13.92%; CaO 19.80%; H_2O 3.50%; CO_2 not determined.

M.Y. Williams (1919, p. 111)

756. **DOLOMITE.** Laurentian Series, Grenville, Que.

31–G–W½ (Anal. T.S. Hunt) Ser. No. *1863–13*

White lamellar dolomite containing a large proportion of grains of honey-yellow serpentine. Part soluble in dilute nitric acid was analysed.
$CaCO_3$ 55.13%; $MgCO_3$ 44.87%.

Geological Survey (1863, p. 593)

757. **TREMOLITIC DOLOMITE.** Occurs extensively in the northeasterly trending belt adjoining the talc mines; from the dump of No. 3 shaft, Henderson mine, less than ¼ mile east of Madoc near the north shore of Moira Lake, lot 14, con. 14, Huntingdon tp., Hastings co., Ont.

31–C–W½ (Anal. G.P. Connell) Ser. No. *1926–19*

A white phase of tremolitic dolomite that carries inclusions of a dark grey phase extensively. The tremolite occurs as partly scattered, rod-like crystals or aggregates of crystals and partly in solid masses or bands and is traversed by fine irregular fractures filled with talc. Grey phase: insoluble residue 0.60%; MgO 21.60%; CaO 31.21%.
White phase: insoluble residue 23.04%; MgO 15.70%; CaO 25.15%.

M.E. Wilson (1926, p. 80)

758. **DOLOMITE.** Rigaud, Vaudreuil co., Que.

31–G–E½ (Anal. T.S. Hunt) Ser. No. *1863–10*

A compact bluish black dolomite containing masses of calcite.
Al_2O_3, Fe_2O_3 and FeO 2.40%; $MgCO_3$ 27.00%; $CaCO_3$ 33.70%; clay 36.90%.

Geological Survey (1863, p. 619)

759. **DOLOMITE.** Palliser Formation (a and b), and Fairholme Formation (c, d, e, f); McColl-Frontenac No. 1 well, Moose Mountain map-area, Alta.
82–J–E½ (Anal. F.J. Fraser) Ser. No. *1943–12*

The zone represented by sample c alone maintains a thickness of 100 feet or more for many miles along the mountain front. It is a coarse-grained, light grey dolomite. Nos. a, b, d, e, f are dark steel-grey, fine-grained dolomite.

	759 (a)	759 (b)	759 (c)	759 (d)	759 (e)	759 (f)
CaO............	31.5	32.5	31.5	31.0	32.5	32.0
MgO............	20.8	19.4	19.5	21.2	19.9	19.5
$CaCO_3$ (calcd.) ..	56.2	58.0	56.2	55.2	58.0	57.1
$MgCO_3$ (calcd.) ..	43.5	41.6	40.9	44.3	41.6	40.9

H.H. Beach (1943, p. 71)

760. **DOLOMITE.** From the gypsum quarries, at Paris, on Grand River, Ont.
40–P–E½ (Anal. Delesse) Ser. No. *1863–14*

Vesicular argillaceous dolomite, brownish yellow.
$CaCO_3$ 51.33%; $MgCO_3$ 40.91%; argillaceous residue 5.50%; H_2O 2.26%.

Geological Survey (1863, p. 625)

761. **SHALE.** Lowest beds in the Caledonia gypsum mine, Oneida tp., Haldimand co., Ont.

30–M–W½ (Anal. Mines Branch) Ser. No. *1919–17*

SiO_2 12.34%; Al_2O_3 3.93%; Fe_2O_3 0.41%; FeO 1.94%; MgO 16.17%; CaO 24.20%; H_2O 3.00%.

M.Y. Williams (1919, p. 115)

762. **LIMESTONE.** From a 6-foot bed of ferruginous limestone in the upper part of the Cabot Head shale at Limehouse, Esquesing tp., Halton co., Ont.

30–M–W½ (Anal. Mines Branch) Ser. No. *1919–3*

Al_2O_3 2.48%; Fe_2O_3 20.72%; $CaCO_3$ 28.84%; $MgCO_3$ 21.59%; $FeCO_3$ 2.05%; insoluble 22.18%.

M.Y. Williams (1919, p. 110)

763. **MAGNESIAN LIMESTONE.** Associated with graptolitic shales in the lower part of the Hudson River Group; Gaspé Bay, Que.

22–A–W½ (Anal. T.S. Hunt) Ser. No. *1857–4*

The lower part of this group exhibits a thin-bedded, black, very compact rock of argillaceous aspect. It weathers reddish yellow and is characterized by the occurrence of thin crystalline crusts of carbonate of lime adhering to the surface of the beds.
Fe_2O_3 4.10%; $MgCO_3$ 32.12%; $CaCO_3$ 43.17%; insoluble residue 20.30%.

T.S. Hunt (1858, p. 203)

764. **DOLOMITE.** Coboconk, Bexley tp., Victoria co., Ont.

31–D–E½ (Anal. F.D. Adams) Ser. No. *1882–3*

Light greenish grey, very finely crystalline rock with a close and uniform texture.
$CaCO_3$ 50.74%; $MgCO_3$ 35.53%; insoluble 9.96%.

G.C. Hoffmann (1884, p. 2)

765. **LIMESTONE.** Quirke Lake, tp. 144, Algoma district, Ont.

41–J–E½ (Anal. H.A. Leverin) Ser. No. *1925–1*

Espanola limestone overlying Espanola greywacke. The greywacke grades into limestone by appearance of an increasing number of thin limestone beds until limestone and silty material in beds from a few inches to a couple of feet thick are about equal in amount. Towards the top, the limestone layers are fewer and thinner and finally disappear, and the grey silty material merges imperceptibly into the quartzitic base of the Serpent quartzite. The carbonate is disseminated in fine grains through a silty groundmass consisting of chlorite, sericite, and biotite shreds felted together and holding minute particles of quartz, feldspar, pyrite, zircon, and an opaque white material. Delicate stratification still prominent in the field continues down to exceedingly thin films.
Fe_2O_3 and FeO 3.79%; MgO 11.94%; CaO 25.50%; CO_2 33.17%; S 0.14%; Al_2O_3, MnO and H_2O 23.25%.

W.H. Collins (1925, p. 50)

766. **DOLOMITE.** DeCew Waterlime beds, Lockport dolomite, St. Davids, Niagara tp., Lincoln co., Ont.

30–M–W½ (Anal. Mines Branch) Ser. No. *1919–10*

Argillaceous, fine-grained, dark grey, dolomitic limestone in a bed 8 to 9 feet thick.
SiO_2 21.70%; Al_2O_3 5.88%; Fe_2O_3 1.28%; FeO 0.90%; MgO 12.98%; CaO 23.62%; H_2O 1.00%.

M.Y. Williams (1919, p. 112)

767. **LIMESTONE.** Thin interbeds in shale below gypsum horizon; Paris, Dumtries tp., Brant co., Ont.

40–P–E½ (Anal. Mines Branch) Ser. No. *1919–18*

MgO 15.15%; CaO 27.77%; H_2O 0.33%; S 0.60%; H_2CO_3 33.42%; insoluble 3.32%; CaO/MgO 1.83%.

M.Y. Williams (1919, p. 116)

768. **LIMESTONE.** In the immediate vicinity of granite outcrops, west of Sydenham Brook, Inverness co., N.S.

11–F–W½ (Anal. Bras d'Or Lime Co.) Ser. No. *1927–37*

Coarsely crystalline rock. White when freshly broken but turning a bluish colour on weathering.
SiO_2 0.66%; Al_2O_3 1.45%; Fe_2O_3 0.74%; $MgCO_2$ 37.80%; $CaCO_3$ 59.50%; S 0.06%.

T.D. Guernsey (1928, p. 79)

769. **SHALE.** Rochester shale from the upper 4 feet of a dolomitic limestone bed 8 to 9 feet thick, Hamilton, Wentworth co., Ont.

30–M–W½ (Anal. Mines Branch) Ser. No. *1919–9*

Argillaceous, fine-grained, dark grey rock.
SiO_2 22.52%; Al_2O_3 8.12%; Fe_2O_3 1.01%; FeO 1.13%; MgO 10.14%; CaO 21.83%; H_2O 4.00%.

M.Y. Williams (1919, p. 111)

770. **SHALE.** Rochester shale, 3 feet above the base, Hamilton, Wentworth co., Ont.

30–M–W½ (Anal. Mines Branch) Ser. No. *1919–8*

Argillaceous, fine-grained, dark grey dolomitic limestone in a bed 8 to 9 feet thick.
SiO_2 22.00%; Al_2O_3 12.65%; Fe_2O_3 0.46%; FeO 1.77%; MgO 7.77%; CaO 20.81%; H_2O 7.20%.

M.Y. Williams (1919, p. 111)

771. **LIMESTONE.** Passing by insensible gradations into dolomite; lot 11, rge. 3, McNab tp., near Arnprior, Renfrew co., Ont.

31–F–E½ (Anal. B.J. Harrington) Ser. No. *1876–16*

Compact limestone, dark brownish grey when fractured. When polished it shows sections of fossils and presents a mottled surface of dark grey, with patches of light grey and yellowish brown.
$CaCO_3$ 81.78%; $MgCO_3$ 13.68%.

B.J. Harrington (1878, p. 486)

772. **LIMESTONE.** Chazy Formation, Pembroke, Renfrew co., Ont.

31–F–W½ (Anal. B.J. Harrington) Ser. No. *1876–17*

Light brownish grey rock, compact and breaking with a conchoidal fracture. In beds from 3 to 18 inches thick.
$FeCO_3$ 0.69%; $MgCO_3$ 9.29%; $CaCO_3$ 83.96%; insoluble 6.06%.

B.J. Harrington (1878, p. 486)

773. **LIMESTONE.** Along the mercury belt, Pinchi Lake District, Fort St. James map-area, Cassiar and Coast districts, B.C.

93–N–W½ (Anal. R.J.C. Fabry) Ser. No. *1942–4*

The limestones of the area are normally blue-grey, grey weathering, medium-grained to dense, with stylolitic structures, and in some places are completely recrystallized. Chert occurs along original bedding planes or in white-weathering nodules. Many bands contain argillaceous material, and some are altered hydrothermally to buff-weathering dolomitic rock. Many bands are iron stained and most are crisscrossed with calcite stringers.

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
SiO_2		3.07	27.97	22.75			3.07	0.22
$(FeAl)_2O_3$	0.81	0.77	1.80#	0.99	1.59	0.15#	1.56#	0.14
MgO	1.62	7.40	0.21	12.10	17.97	0.31	1.38	0.07
CaO	55.60	45.07	34.81	26.90	34.03	55.41	51.32	55.14
Na_2O	0.07	0.20	1.05	0.20	0.11	0.27	0.11	nil
K_2O			0.08					
MnO		0.07	0.01	0.11		trace	0.05	nil
Insoluble	0.87	3.25	33.01	24.64	0.38	0.07	3.21	0.55

– in these samples, iron predominates.

J.E. Armstrong (1949, pp. 34–36)

774. **LIMESTONE.** In the old quarry, just west of Saanich Inlet, 1 mile west of Raymond crossing 1½ miles north of Shawnigan Lake, Vancouver Island, B.C.

92–H–W½ (Anal. H.A. Leverin) Ser. No. *1917–9*

Crystalline, grey to bluish grey or less commonly white, compact to medium-grained marble, consisting essentially of calcite, or magnesian calcite, in small grains sometimes microscopic that are firmly cemented together. The accessories are small amounts of argillaceous and carbonaceous matter. Pyrite occurs disseminated in minute cubical grains. Al_2O_3, Fe_2O_3, and FeO 2.00%; $MgCO_3$ 0.96%; $CaCO_3$ 93.12%; insoluble mineral matter 1.80%.

C.H. Clapp (1917, p. 107)

775. **LIMESTONE.** Marble Mountain, West Bay, Cape Breton Island, N.S.

11–F–W½ (Anal. H. How) Ser. No. *1877–17*

Bluish crystalline limestone, about 100 feet thick.

Residue 4.35%; Al_2O_3, Fe_2O_3, and FeO 0.45%; $MgCO_3$ 0.75%; $CaCO_3$ 94.31%; H_2O 0.14%; H_3PO_4 traces.

H. Fletcher (1879, p. 29)

776. **LIMESTONE.** Takla Lake, Pinchi fault zone, outcropping on BB group, Silver Creek, Fort St. James map-area, Cassiar and Coast districts, B.C.

93–N–W½ (Anal. R.J.C. Fabry) Ser. No. *1944–6*

Blue-grey normal limestone, grey-weathering, medium grained to dense with stylolitic structures observed in some areas. Recrystallization is complete, so evidence of bedding is lost. Chert occurs along original bedding planes or in white-weathering nodules. Many bands are iron-stained and most are crisscrossed with calcite stringers. Some bands contain argillaceous material, and some are dolomitic.

SiO_2 0.11%; Al_2O_3, Fe_2O_3, and FeO 0.20%; MgO 0.27%; CaO 55.46%; Na_2O and K_2O not determined; insoluble 0.41%.
(Insoluble covers that part not soluble in hydrochloric acid. The silica was determined on this separately).

J.E. Armstrong (1949, pp. 34–36)

777. **LIMESTONE.** Takla Lake, from the Bron Group of claims along the west fork of Kwanika Creek, Fort St. James map-area, Cassiar and Coast districts, B.C.

93–N–W½ (Anal. R.J.C. Fabry) Ser. No. *1944–1*

Brecciated buff limestone. Chert occurs along original bedding planes or in white weathering nodules. Many bands are iron stained and most are crisscrossed with calcite stringers. Some bands contain argillaceous material. Altered hydrothermally to buff weathering dolomitic rocks.

J.E. Armstrong (1949, pp. 34–36)

778. **LIMESTONE.** Near the Pinchi fault zone, from "A" showing, Bralorne Takla Mercury Mine, Takla Lake, Fort St. James map-area, Cassiar and Coast districts, B.C.

93–N–W½ (Anal. R.J.C. Fabry) Ser. No. *1944–4*

Blue-grey, grey weathering, medium-grained to dense limestone in some areas completely recrystallized so evidence of bedding is lost. Stylolitic structures were observed. Chert occurs along the original bedding planes or in white weathering nodules. Many bands are iron stained and most are crisscrossed with calcite stringers.

J.E. Armstrong (1949, pp. 34–36)

779. **LIMESTONE.** From "A" showing, Bralorne Takla Mercury Mine, Takla Lake, Fort St. James map-area, Cassiar and Coast districts, B.C.

93–N–W½ (Anal. R.J.C. Fabry) Ser. No. *1944–3*

Normal blue-grey limestone, grey-weathering, medium grained to dense, in some places completely recrystallized. Stylolitic structures were observed. Chert occurs along the original bedding plane or in white weathering nodules. Many bands are iron stained and most are crisscrossed with calcite stringers. Some bands contain argillaceous material and some are dolomitic.

J.E. Armstrong (1949, pp. 34–36)

780. **LIMESTONE.** From "A" showing, Bralorne Takla Mercury Mine, Takla Lake, Fort St. James map-area, Cassiar and Coast districts, B.C.

93–N–W½ (Anal. R.J.C. Fabry) Ser. No. *1944–2*

White limestone containing cinnabar. Chert occurs along original bedding planes or in white weathering nodules. Many bands are iron stained and most are crisscrossed with calcite stringers. Some bands contain argillaceous material, and some are dolomitic.

J.E. Armstrong (1949, pp. 34–36)

781. **LIMESTONE.** Pinchi fault zone, Bralorne Takla Mercury Mine, Takla Lake, Fort St. James map-area, Cassiar and Coast districts, B.C.

93–N–W½ (Anal. R.J.C. Fabry) Ser. No. *1944–7*

Brecciated buff limestone containing cinnabar. Chert occurs along original bedding planes or in white weathering nodules. Many bands are iron stained and most are crisscrossed with calcite stringers. Some bands contain argillaceous material. Altered hydrothermally to buff weathering dolomitic rocks.

J.E. Armstrong (1949, pp. 34–36)

	777	778	779	780	781
SiO_2	1.02	1.00	3.04	nil	0.95
Al_2O_3, Fe_2O_3 and FeO	0.62	0.42	0.41	0.10	0.57
MgO	0.13	0.10	0.05	0.05	0.04
CaO	54.18	55.29	50.06	56.05	52.52
Na_2O			0.45		0.14
K_2O			0.05		
insoluble	2.89	1.41	4.21	0.19	1.55
$MgCO_3$ (calcd.)	0.27	0.21	0.10	0.10	0.08
$CaCO_3$ (calcd.)	97.71	98.69	89.35	100.30	94.75

782. **LIMESTONE.** Typical member of the Ottertail Formation, exposed on the upper part of the Ottertail Mountains, between Ottertail and Beaverfoot Valleys in the Moose Creek Valley, and in the Ice River Valley, B.C.

82–M–E½ (Anal. John Allan) Ser. No. *1914–22*

The formation is composed essentially of limestone, massive and thin bedded, with intercalated layers of calcareous shale. On a fresh surface the rock composing the whole band is characterized by its grey or bluish grey colour, whereas on weathered faces it is light grey to black. Limestone is more or less metamorphosed where it is in contact with the igneous intrusive mass.

Carbonates 98%; insoluble residue 2% (soluble material gave trace of alumina and silica, about 2% magnesia, and the rest lime).

J.A. Allan (1914, p. 87)

783. **DOLOMITE.** Castle Mountain Formation, Mount Stephen, B.C.

82–N–E½ (Anal. F.D. Adams) Ser. No. *1886–21*

Bluish grey rock with indistinct lines of banding.
Carbonates 98.93%; insoluble 1.07%.

R.G. McConnell (1887, p. 26)

784. **DOLOMITE.** Castle Mountain Formation, Ottertail Valley, B.C.

82–N–E½ (Anal. F.D. Adams) Ser. No. *1886–5*

The rock is composed of more or less lenticular pieces of a bluish dolomite separated by thin partings of argillaceous matter.
Carbonates 57.48%; insoluble 42.52%.

R.G. McConnell (1887, p. 26)

785. **DOLOMITE.** Castle Mountain Formation, Mount Hunter, B.C.

82–N–E½ (Anal. F.D. Adams) Ser. No. *1886–3*

Buff coloured with a well-developed schistose structure.
Carbonates 56.93%; insoluble 43.07%.

R.G. McConnell (1887, p. 27)

786. **DOLOMITIC ARGILLITE.** Castle Mountain Formation, Van Horne Mountains, B.C.

82–N–E½ (Anal. F.D. Adams) Ser. No. *1886–4*

Very finely laminated brown dolomitic argillite showing lines of bedding transverse to the plane of lamination.
Carbonates 17.28%; insoluble 82.72%.

R.G. McConnell (1887, p. 26)

787. **CALCIUM PHOSPHATE ROCK.** A 1-inch band in the lower part of the Scotia bed, zone 4, Wabana Iron Ore Formation, Bell Island, Nfld.

1–N–E½ (Anal. A.O. Hayes) Ser. No. *1915–56*

The lower part of the band is made up of thin films of sandy shale and the upper part includes a band of calcium phosphate rock. The shale is composed of chamosite with small fragments of quartz and shells arranged in lines parallel with bedding in the rock. The bedded arrangement is shown in films of black material, probably carbonaceous calcium phosphate, composed of rectangular fragments varying from minute to ½ mm. Most of these have been so highly altered that the original shell structure is obliterated. The fragments are closely packed with interstitial space occupied by chamosite. A subordinate amount of fragmental quartz is shown by minute, white, irregular areas. Siderite frequently surrounds these grains, and appears to have partly replaced many of them. A platy mineral appears as long, thread like forms, parallel to the bedding and is probably crystalline chamosite.
SiO_2 8.02%; Fe_2O_3 18.78%; CaO 37.30%; P_2O_5 28.76%.

A.O. Hayes (1915, p. 52)

788. **PEBBLE BED.** 1 foot above zone 4, Wabana Iron Ore, Bell Island, Nfld.

1–N–E½ (Anal. A.V. Seaborn) Ser. No. *1915–60*

Phosphate nodules and shell fragments occur in sandy shale. The phosphatic material is light brown in transmitted light and remains dark between cross nicols.
SiO_2 27.78%; Fe_2O_3 14.41%; P_2O_5 12.26%; CO_2 0.95%.

A.O. Hayes (1915, p. 52)

789. **CONGLOMERATE.** A bed as much as 2 feet thick, interbedded with sandstone of Rocky Mountain Formation; southwest-facing slope near the northwest end of Llama Mountain, Kvass Flats map-area, Alta.

83–E–W½ (Anal. J.A. Maxwell) Ser. No. *1954–5*

Dark grey, dirty looking conglomerate composed of well-rounded pebbles and grains of quartz and chert with some phosphatic nodules embedded in a turbid, sometimes yellow matrix. Some fragments of foraminifera, bryozoa, etc., were present.
P_2O_5 18.45%.
Spectrographic analysis: Ca, Si 10–100%; Al, P, K 1–10%; Fe, Mg, Na 0.1–1%; Ti, Ba, Sr, La, Y, Yb 100–1,000 ppm; Mn, Cr, Ni, V, Cu, Zr, Zn, Li 10–100 ppm.

(E.J.W. Irish)

790. **PHOSPHATE ROCK.** Occurs within a few feet of the top of Rocky Mountain quartzite, which is generally covered with talus or glacial drift; west end of Lake Minnewanka, Banff area, Alta.

92–O–W½ (Anal. M.F. Connor) Ser. No. *1927–10*

Dark grey to black, very fine grained, occasionally oolitic rock bearing a strong resemblance to basalt, weathers light brownish. Breaks with uneven fracture tending to conchoidal fracture.
Insoluble 84.39%; Al_2O_3 0.80%; Fe_2O_3 0.70%; MgO 0.51%; CaO 6.14%; H_2O 1.25%; P_2O_5 3.68%; MnO trace; CO_2 2.00%; F 0.16%.

P.S. Warren (1927, p. 74)

791. **BRACHIOPOD SHELL.** One complete valve of the brachiopod *Lingula hawkei*, from a shell-fragment-rich layer, closely packed, cemented by chamosite; lower part of zone 4, Wabana Iron Ore, Bell Island, Nfld.

1–N–E½ (Anal. A.O. Hayes) Ser. No. *1915–55*

The original sculpture is preserved and the analysis approximates very closely its original chemical composition. The hematite and calcite were probably introduced by mechanical means.
SiO_2, Al_2O_3, Fe_2O_3 9.68%; CaO 47.12%; P_2O_5 36.94%.

A.O. Hayes (1915, p. 56)

792. **COPROLITE.** Hawkesbury, Prescott co., Ont.

31–G–E½ (Anal. T.S. Hunt) Ser. No. *1851–3*

Rounded forms, ¼ to ½ inch in diameter. The exterior is blackish brown, the interior is yellowish brown.
SiO_2 27.90%; Al_2O_3 trace; Fe_2O_3 8.60%; $MgCO_3$ 4.76%; $CaCO_3$ 6.60%; phosphate of lime 44.70%; volatile 5.00%.

T.S. Hunt (1852, p. 111)

793. **COPROLITE.** Nodules in a brecciated limestone associated with green and red shales; River Ouelle, Kamouraska co., Que.

21–N–W½ (Anal. T.S. Hunt) Ser. No. *1876–1*

Occurs chiefly in round grains varying from the size of a large pea to that of a small shot. Besides grains of quartz, small cylindrical bodies resembling the spicula of sponges are also present.
Insoluble residue 25.44%; Al_2O_3, Fe_2O_3, FeO, MnO 12.62%; $MgCO_3$ 9.70%; $CaCO_3$ (with some fluoride) 5.14%; Ca_3 $(PO_4)_2$ 4.34%; volatile 2.13%. Sp. gr. 3.50.

Geological Survey (1863, p. 462)

794. **CALCAREOUS CONCRETION.** Bearpaw Formation, Cypress Hills area, Sask.

72–F–W½ (Anal. R.J.C. Fabry) Ser. No. *1942–2*

Dark brown weathering, fossiliferous, concretionary layers present in the Belanger Member and elsewhere in the Bearpaw Formation.
Mn in soluble portion 0.47%; Mn in insoluble portion 0.01%; P_2O_5 0.93%.

(G.M. Furnival)

795. **CALCAREOUS CONCRETION.** Bearpaw Formation, Cypress Hills area, Sask.

72–F–W½ (Anal. R.J.C. Fabry) Ser. No. *1942–1*

Dark brown weathering, fossiliferous concretionary layers present in the Belanger Member and elsewhere in the Bearpaw Formation.
P 0.41%; Mn 0.99%.

(G.M. Furnival)

796. **SEA BOTTOM.** Collected at the time of the Atlantic cable break, off the coast of Newfoundland.

? (Anal. R.J.C. Fabry) Ser. No. *1930–14, 15, 16*

Represents about 20 lots received from vessels repairing the cables broken by the earthquake.

(E.M. Kindle)

	796 (a)	796 (b)	796 (c)
MgO	2.90	2.60	2.11
CaO	8.68	3.97	5.53
Equivalent to			
$MgCO_3$	6.07	5.43	4.30
$CaCO_3$	15.48	5.18	0.86

797. **BITUMINOUS SANDSTONE.** Lying in thick horizontal layers upon Devonian limestone and in some cases filling fissures in the limestone on Athabasca River, 6 miles below the confluence with Clearwater River, Alta.

74–D–W½ (Anal. G.C. Hoffmann) Ser. No. *1880–14*

Compact and homogeneous, dull, dark brownish black rock. The sand consists of colourless transparent quartz, not unfrequently presenting the bright glassy lustre of broken quartz crystal, the surfaces dulled by abrasion. It contained a few flakes of silvery mica and an occasional fragment of feldspar.
Bitumen 12.42%; water mechanically included 5.85%; siliceous sand 81.73%; specific gravity at 60°F. 2.040.

G.C. Hoffmann (1883, p. 3)

798. **VANADIUM-BEARING ROCK.** Extracted from the remains of pockets of a carnotite-like mineral occurring in the crevices of lava flows and embedded in a band 1 inch to 4 inches thick, between two flows; north end of Gowland Harbour, Quadra Island, B.C.

92–K–E½ (Anal. H. Ellsworth?) Ser. No. *1932–25*

Finely banded siliceous, carbonaceous material. Silica is present mostly as quartz, copper is present as chalcocite and also as malachite and probably in small amounts as sulphate and silicate.

SiO_2 75.31%; Al_2O_3 3.70%; FeO 2.29%; MgO 0.53%; CaO 4.08%; H_2O 2.61%; TiO_2 0.15%; P_2O_5 trace; MnO 0.10%; CO_2 trace; S 0.72%; Cu 2.88%; V_2O_5 2.16%; U and Cr not detected; S trace (as SO_3); C about 5% by calculation.

H.V. Ellsworth and H.C. Gunning (1933, p. 53)

799. **IRONSTONE.** A layer only a few inches thick, in Pierre shales, in the immediate vicinity of the main coal seam; Belly River, Alta.

82–H–E½ (Anal. G.C. Hoffmann) Ser. No. *1880–5*

Very fine granular, brownish grey rock.
Fe_2O_3 0.33%; FeO 41.46%; H_2O 1.04%; insoluble 10.29%.

G.C. Hoffmann (1883, p. 11)

800. **IRONSTONE.** Nodules of large size and considerable abundance in the Pierre shales, Bow River, 8 miles above Grassy Island, Alta.

82–I–E½ (Anal. G.C. Hoffmann) Ser. No. *1880–2*

Very fine granular, ash grey with a brownish tinge, weathering purplish brown. The fracture is imperfectly conchoidal.
Fe_2O. 0.88%; FeO 40.35%; H_2O 0.86%; insoluble 16.12%.

G.C. Hoffmann (1883, p. 10)

801. **CLAY IRONSTONE.** Christie coal mine, sec. 10, rge. 1, tp. 5, west of the 5th initial meridian, Alta.

82–J–E½ (Anal. F.G. Wait) Ser. No. *1892–21*

Greyish black.
Insoluble 2.66%; metallic iron (calcd.) 33.32%.

G.C. Hoffmann (1895, p. 37)

802. **CLAY IRONSTONE.** Smoky River, 17 miles above Little Smoky River, Alta.

83–N–W½ (Anal. F.D. Adams) Ser. No. *1879–13*

Very compact, dark brownish grey rock inclining to reddish brown on weathered surfaces. It is tough with a dull earthy lustre and conchoidal fracture.
Fe_2O_3 1.41%; FeO 38.56%; H_2O 0.84%; insoluble 15.95%.

G.C. Hoffmann (1881, p. 16)

803. **IRONSTONE.** About 4 miles above the mill, on Mill Creek, Alta.

82–G–E½ (Anal. G.C. Hoffmann) Ser. No. *1880–8*

Fine-grained, dark grey rock with irregular fracture weathering dark reddish brown.
Fe_2O_3 0.81%; FeO 37.98%; H_2O 0.63%; insoluble 22.51%.

G.C. Hoffmann (1883, p. 12)

804. **IRONSTONE.** Belly River, about 17 miles east of the mouth of the Little Bow River, Alta.

82–H–E½ (Anal. G.C. Hoffmann) Ser. No. *1880–7*

Compact, pale brownish yellow rock weathering brownish yellow, with conchoidal fracture. It is from a series of beds whose stratigraphic position is not certain and which contains estuarine fossils and occasionally many large nodules and nodular sheets of ironstone.
Fe_2O_3 1.49%; FeO 30.30%; H_2O 1.45%; insoluble 12.12%.

G.C. Hoffmann (1883, p. 11)

805. **IRONSTONE.** From a series of pale sandstones and sandy clays, which underlie the Pierre shales, Belly River, about 7 miles below "Coal Banks", Alta.

82–H–E½ (Anal. G.C. Hoffmann) Ser. No. *1880–6*

Fine-grained, pale reddish brown rock weathering dark reddish brown, with irregular fracture. Nodules are remarkable for their great size and septarian character.
Fe_2O_3 1.40%; FeO 30.73%; H_2O 1.27%; insoluble 23.75%.

G.C. Hoffmann (1883, p. 11)

806. **IRONSTONE.** Bow River, 12 miles above Prairie Island, Alta.

72–L–W½ (Anal. G.C. Hoffmann) Ser. No. *1880–3*

Compact, pale ash grey rock weathering reddish brown, with conchoidal fracture. From a series of beds whose stratigraphic position is not certain and which contains estuarine fossils and occasionally many large nodules and nodular sheets of ironstone.

Fe_2O_3 0.82%; FeO 28.82%; H_2O 0.94%; insoluble 13.94%.

G.C. Hoffmann (1883, p. 10)

807. **IRONSTONE.** Forms a series of beds each a few inches thick, which are intercalated in black shales in such great number as to form a considerable proportion of the whole; Kananaskis or Rapid River, near its confluence with Bow River, Alta.

82–O–W½ (Anal. G.C. Hoffmann) Ser. No. *1880–4*

Very fine granular, dark bluish grey rock weathering brownish red, with imperfectly conchoidal fracture.

Fe_2O_3 0.77%; FeO 13.79%; H_2O 0.47%; insoluble 66.97%.

G.C. Hoffmann (1883, p. 10)

808. **IRON FORMATION.** Sample taken across a thickness of 24 feet at the north part of Innetalling Island, Belcher Islands, Hudson Bay.

34–D–W½ (Anal. Mines Branch) Ser. No. *1921–1*

The upper 200 feet of the iron formation consists of alternations of thick zones of green-grey siliceous taconite and thinner zones of dark dense strata. Beneath these is a ferruginous zone about 30 feet thick Comparable to the ferruginous zone of the Kasegalik-Kipalu area.

SiO_2 42.12%; Fe_2O_3 50.79%; FeO 3.05%; MgO 1.44%; CaO 0.50%; TiO_2 0.08%; S 0.04%; P 0.03%; Mn 0.35%.

G.A. Young (1922, p. 50) *See also* Nos. 809, 810, 811, 812 *(1921–2, 3, 4)*

809. **IRON FORMATION.** Representing a thickness of 2 feet of black magnetite-rich beds at the top of the ferruginous zone; on the shore of the Kipalu Inlet, mining loc. No. 13, Flaherty Island, Belcher Islands, Hudson Bay.

34–D–W½ (Anal. Mines Branch) Ser. No. *1921–2*

An iron formation underlies a ridge of volcanic rocks between Kasegalik Lake Valley and Kipalu Inlet. The iron band is at least 16 miles long and at a horizon 120 to 150 feet below the summit of the formation lies a ferruginous zone at least 40 or 50 feet thick. The ferruginous zone is composed of distinct beds, some black, and largely of magnetite and hematite in various proportions and amounts. Some of the layers are fine grained but most are granular. Interleaved with these measures are thin, discontinuous, irregular layers with a very low iron content: SiO_2 23.96%; Fe_2O_3 41.41%; FeO 29.92%; MgO 1.00%; CaO 0.36%; TiO_2 0.04%; S 0.10%; P 0.09%; Mn 0.64%.

G.A. Young (1922, p. 50) *See also* Nos. 808, 810, 811, 812 *(1921–1, 3, 4)*

810. **IRON FORMATION.** Representing a thickness of 12 feet, 6 feet from the top of zone and downwards, on the shores of Kipalu Inlet, mining loc. No. 13, Flaherty Island, Belcher Islands, Hudson Bay.

34–D–W½ (Anal. Mines Branch) Ser. No. *1921–3*

Description same as No. 809.
SiO_2 32.52%; Fe_2O_3 42.30%; FeO 19.74%; MgO 1.54%; CaO 0.40%; TiO_2 0.10%; S 0.05%; P 0.07%; Mn 0.64%.

G.A. Young (1922, p. 50) *See also* Nos. 808, 809, 811, 812 *(1921–1, 2, 3, 4)*

811. **IRON FORMATION.** From thickness of 11 feet immediately below the 2-foot black layer (No. 809) on the shores of Kipalu Inlet, mining loc. No. 13, Flaherty Island, Belcher Islands, Hudson Bay.

32–D–W½ (Anal. Mines Branch) Ser. No. *1921–3*

Description same as No. 809.
Fe_2O_3 43.50%; FeO 11.12%; SiO_2 38.60%; CaO 0.64%; MgO 1.61%; Mn 0.34%; TiO_2 0.08%; S 0.01%; P 0.06%.

G.A. Young (1922, p. 50) *See also* Nos. 808, 809, 810, 812 *(1921–1, 2, 3, 4)*

812. **IRON FORMATION.** Representing a thickness of 15 feet of the strata, mining loc. No. 20, Kasegalik Lake, Flaherty Island, Belcher Islands, Hudson Bay.

34–D–W½ (Anal. Mines Branch) Ser. No. *1921–4*

Description same as No. 809
SiO_2 46.48%; Fe_2O_3 45.10%; FeO 4.95%; MgO 1.37%; CaO 0.34%; TiO_2 0.08%; S 0.01%; P 0.04%; Mn 0.24%.

G.A. Young (1922, p. 50) *See also* Nos. 808, 809, 810, 811 *(1921–1, 2, 3)*

813. **IRON FORMATION.** Banded silica iron formation in bed about 1 foot wide immediately on top of a rhyolite flow just west of Messenger Brook about 700 yards above Canaan Road, Annapolis co., N.S.

21–A–W½ (Anal ?) Ser. No. *1933–10*

SiO_2 41.26%; CaO 8.60%; MnO_2 6.63%; Fe 12.00%.

(H.E. Lovitt)

814. **OOLITIC HEMATITE.** Upper part of the Scotia bed, zone 4, Wabana Iron Ore Formation, Bell Island, Nfld.

1–N–E½ (Anal. A.V. Seaborn) Ser. No. *1915–63*

A bed, 4 feet 4 inches thick, showing spherules composed of concentric layers of hematite and chamosite surrounded by siderite. Sections of boring algae are seen as minute, round white dots in the spherules. Quartz is present only rarely as nuclei of the spherules.
SiO_2 5.36%; Fe_2O_3 84.96%; P_2O_5 1.54%; CO_2 1.22%; specific gravity 4.50.

A.O. Hayes (1915, p. 53)

815. **OOLITIC HEMATITE.** Represents the upper 6 feet of the Dominion Bed and the submarine works, 1½ miles north of the island under the sea, Wabana Iron Ore Formation, Bell Island, Nfld.

1–N–E½ (Anal. A.V. Seaborn) Ser. No. *1915–44*

Consists of oolitic hematite in thick beds with thin ferruginous sandstone and shale parting rocks. The ore is composed of hematite and chamosite, usually in the form of spherules, and whereas the hematite occurs between spherules in the denser ores, chamosite is always found intimately associated with the spherules. Siderite occurs in the upper 6 inches of the zone and appears to be secondary to the chamosite and hematite. Fragmental quartz forms up to 10% of the ore. Small amount of recrystallized quartz is also found in the matrix of the ore.
SiO_2 8.39%; Fe_2O_3 78.38%.

A.O. Hayes (1915, p. 45)

816. **OOLITIC HEMATITE AND CHAMOSITE ORE.** Dominion Bed, lean ore zone, zone 2 Wabana Iron Ore Formation, Bell Island, Nfld.

1–N–E½ (Anal. A.V. Seaborn) Ser. No. *1915–47*

The zone consists of oolitic hematite in thick beds with thin ferruginous sandstone and shale parting rocks. It is composed of hematite and chamosite usually in the form of spherules. While hematite occurs between spherules in the denser ores, chamosite is intimately associated with the structure of the spherules. Fragmental quartz is always present and forms up to 10% of the ore. A small amount of recrystallized quartz is also found in the matrix.
SiO_2 14.80%; Fe_2O_3 73.04%; CaO 3.42%; P_2O_5 2.29%; S 0.03%.

A.O. Hayes (1915, p. 46)

817. **IRON ORE.** From the workable bed in the submarine slope 2, about ½ mile north of the surface outcrop of zone 5, Wabana Iron Ore, Bell Island, Nfld.

1–N–E½ (Anal. A.O. Hayes) Ser. No. *1915–71*

Iron is present as hematite, chamosite, and siderite. Hematite forms 72.70% of the ore, chamosite most of the remainder, while siderite and fragmental quartz are much less abundant. Hematite and chamosite are associated in the form of spherules, many of which have exterior borders of the siderite.
SiO_2 8.60%; Al_2O_3 4.82%; Fe_2O_3 72.70%; FeO 8.37%; P_2O_5 1.22%; CO_2 1.38%; specific gravity 4.20.

A.O. Hayes (1915, p. 64)

818. **OOLITIC HEMATITE ORE.** From a series of samples taken at intervals from bottom to top from a surface outcrop of the Dominion Bed, zone 2, Wabana Iron Ore, Bell Island, Nfld.

1–N–E½ (Anal. A.V. Seaborn) Ser. No. *1915–49*

Hematite occurs in thick beds with thin ferruginous sandstone and shale parting rocks. It is composed of hematite and chamosite in spherules. Hematite is also found between the spherules in the denser ores and chamosite is always found intimately associated with the structure of the spherules. Fragmental quartz forms up to 10% of the ore.
SiO_2 18.80%; Fe_2O_3 71.88%; CaO 1.12%; P_2O_5 0.94%; S 0.02%.

A.O. Hayes (1915, p. 46)

819. **OOLITIC HEMATITE ORE.** From the series of samples taken at intervals from bottom to top, from a surface outcrop of the Dominion Bed, zone 2, Wabana Iron Ore, Bell Island, Nfld.

1–N–E½ (Anal. A.V. Seaborn) Ser. No. *1915–50*

Oolitic hematite ore holding many brachiopod shell fragments and nodules and phosphatic pebbles. The ore is composed of hematite and chamosite intimately associated in the spherules. Hematite also occurs between the spherules in denser ores. Fragmental quartz forms up to 10% of the ore.
SiO_2 17.64%; Fe_2O_3 68.26%; CaO 1.16%; P_2O_5 1.11%; S 0.01%.

A.O. Hayes (1915, p. 46)

820. **IRON ORE.** In the upper part of zone 2, Wabana Iron Ore Formation, Bell Island, Nfld.

1–N–E½ (Anal. A.V. Seaborn) Ser. No. *1915–45*

The ore is made up chiefly of chamosite and siderite in a band only a a few inches thick in the top of the zone. The spherules of chamosite appear to have been the first to form and have been later cemented together by other chamosite. Siderite is not a primary constituent of the spherules or nodules and frequently replaces them.
SiO_2 12.66%; Fe_2O_3 48.60%; P_2O_5 3.24%; CO_2 18.17%; specific gravity 4.40.

A.O. Hayes (1915, p. 45)

821. **IRON ORE.** From a series of samples taken at intervals from bottom to top from the surface outcrop of zone 2, Wabana Iron Ore, Bell Island, Nfld.

1–N–E½ (Anal. A.V. Seaborn) Ser. No. *1915–52*

Oolitic hematite and chamosite holding many brachiopod shell fragments. Siderite is not a primary constituent of the spherules or nodules and frequently replaces them. The zone consists of a series of bands of oolitic hematite alternating with shales and crossbedded, fine-grained sandstones.
SiO_2 16.99%; Fe_2O_3 45.94%; CaO 1.76%; P_2O_5 1.25%; S 0.39%.

A.O. Hayes (1915, p. 46)

822. **OOLITIC HEMATITE ORE.** From a series of samples taken at intervals from bottom to top, surface outcrop of the Dominion Bed, Wabana Iron Ore, Bell Island, Nfld.

1–N–E½ (Anal. A.V. Seaborn) Ser. No. *1915–51*

Hard, grey, fine-grained ferruginous sandstone. Ore consists of hematite, chamosite, intimately associated in spherules with much fragmental quartz. Recrystallized quartz is also present.
SiO_2 46.90%; Fe_2O_3 32.46%; CaO 1.38%; P_2O_5 0.20%; S 0.63%.

A.O. Hayes (1915, p. 46)

823. **FERRUGINOUS SANDSTONE.** From a series of samples taken at intervals from bottom to top, from the surface outcrop of Dominion Bed, zone 2, Wabana Iron Ore, Bell Island, Nfld.

1–N–E½ (Anal. A.V. Seaborn) Ser. No. *1915–48*

Parting rock of fine-grained ferruginous sandstone interlaminated as much as 6 inches thick. It consists of alternations of ferruginous sandstone and siliceous shale. The fine-grained sandstone is a mosaic of quartz fragments set in a matrix of uncrystallized and microcrystalline chamosite. Many cross sections of crystalline chamosite are present. Many small shell fragments are found. A few spherules of chamosite are scattered through the thin sections. Siliceous shale consists largely of extremely fine-grained, semi-opaque dark brown material containing small quartz fragments, chamosite, and shell fragments.
SiO_2 49.21%; Fe_2O_3 27.83%; CaO 0.64%; P_2O_5 0.48%; S 0.25.

A.O. Hayes (1915, p. 46)

824. **SANDSTONE.** Martin's Cove, Kelly Island, Nfld.

1–N–W½ (Anal. A.V. Seaborn) Ser. No. *1915–70*

Ferruginous sandstone occurring in a bed about 18 inches thick.
SiO_2 31.98%; P_2O_5 1.74%; CO_2 12.59%; total 46.31%.

A.O. Hayes (1915, p. 64)

825. **OOLITIC PYRITE ORE.** Upper part of zone 3, Wabana Iron Ore, Bell Island, Nfld.

1–N–E½ (Anal. A.V. Seaborn) Ser. No. *1915–54*

The pyrite bed is separated from the underlying bed by 1 foot to 10 feet of shale and consists predominantly of oolitic pyrite occurring in from one to three bands extending through strata from a few inches to 4 feet thick. It thickens and thins and dies out within short distances, but the zone is very persistent. The strata composing the zone are alternated in beds of oolitic pyrite and fine-grained fissile grey-black shale. In the pyrite layers spherules of pyrite occur in extremely fine-grained siliceous groundmass suggesting an original siliceous mud or ooze. Fragments of brachiopod and graptolite remains are plentiful and occur both fresh and in various stages of replacement by pyrite. Quartz occurs in small fragments; no hematite is found in this zone.

SiO_2 9.91%; CaO 0.54%; P_2O_5 0.35%; S 34.46%; Fe 35.18%.

A.O. Hayes (1915, p. 49)

826. **MANGANIFEROUS HEMATITE.** Associated with Silurian strata, a series of pits extending from near Campbell Corners, through Moody Hill, Iron Ore Hill, and Maple Hill to Jackson Town, Carleton and York co., N.B.

21–J–W½ (Anal. Mines Branch) Ser. No. *1936–21*

The ore is in beds or lenslike bodies that conform to the structure of the enclosing and intercalated grey, green, and red slates. The most abundant mineral is finely divided hematite, which probably occurs in a microcrystalline form. It is opaque, and brownish red in reflected light. In a few exposures, small quantities of carbonate are present and varying quantities of fine detrital quartz may also be observed.

	826 (a)	826 (b)	826 (c)	826 (d)	826 (e)	826 (f)
S	.05	.04	.03	.04	.04	.41
P	.83	1.13	.82	1.37	1.37	.09
Fe	20.08	34.04	23.09	30.07	29.43	5.55
Mn	15.0	14.35	14.40	13.0	14.2	10.48
Insoluble	25.79	6.99	21.57	13.77	10.65	47.04

J.F. Caley (1936, p. 20)

827. **IMPURE CALCITE.** In gypsum deposits associated with hydromagnesite deposits on a hillside near Clinton, B.C.

92–P–W½ (Anal. ?) Ser. No. *1920–18*

Al_2O_3 2.62%; Fe_2O_3 2.69%; FeO 0.44%; MgO 3.33%; CaO 13.84%; H_2O+ 3.07%; H_2O- 1.76%; CO_2 10.44%; SO_3 1.37%; insoluble 60.10%; total 99.66%.

L. Reinecke (1920, p. 32)

828. **CEMENTED EARTH.** Underlying hydromagnesite deposits at the centre of deposit 3, Meadow Lake, B.C.

92–P–W½ (Anal. ?) Ser. No. *1920–3*

51 to 60 inches beneath the surface, 15 inches thick of dirty white earth is cemented to a hard mass and forms the base of a hydromagnesite deposit. It is overlain by granulated cream-coloured earth and underlain by sand or clay substance.
SiO_2 7.60%; FeO 0.22%; MgO 20.34%; CaO 25.55%; $CaCO_3$ 45.6%.

L. Reinecke (1920, p. 31)

829. **EARTH.** Occurring near the main masses of hydromagnesite on a hillside 400 feet above the flat, Clinton, B.C.

92–P–W½ (Anal. ?) Ser. No. *1920–20*

Al_2O_3 1.75%; Fe_2O_3 2.25%; FeO 0.26%; MgO 2.49%; CaO 23.04%; H_2O+ 3.73%; H_2O- 3.62%; CO_2 14.64%; SO_3 6.29%; insoluble 42.00%.

L. Reinecke (1920, p. 32)

830. **EARTH.** Occurring near the main masses of hydromagnesite on a hillside 200 feet above the flat, Clinton, B.C.

92–P–W½ (Anal. ?) Ser. No. *1920–19*

Al_2O_3 3.87%; Fe_2O_3 4.04%; FeO 0.18%; MgO 2.39%; CaO 3.30%; H_2O+ 3.82%; H_2O- 1.97%; CO_2 2.52%; SO_3 0.51%; insoluble 77.54%.

L. Reinecke (1920, p. 32)

ANALYSES OF MINERALS

831. NATIVE PLATINUM. Granite Creek, Tulameen River, Yale district, B.C.

92–H–E½ (Anal. G.C. Hoffmann) Ser. No. *1886–19*

Platinum was in the form of grains and pellets varying in size from ½ to 8 mm in diameter, and in weight from 3 to 8 mg. The grains were very much rounded off, and lead-grey with a sub-metallic lustre. All were tarnished and the greater number contained inclusions of chromite. A certain proportion was readily attracted by the magnet. Analysis of the platinum gave:

Fe 8.59%, Cu 3.39%, Rh 2.57%, Pd 0.19%, Os 10.51%, Ir 1.14%; Pt 72.07%; gangue 1.69%. Total 100.15% (gangue = embedded chromite).

Sp. gr. 16.66.

G.C. Hoffmann (1887, p. 5)

832. NATIVE IRON. In a pegmatite vein; lot 7, sec. B, Cameron tp., Nipissing district, Ont.

31–L–W½ (Anal. R.A.A. Johnston) Ser. No. *1892–20*

Steel-grey spherules with a metallic lustre. Almost perfectly spherical, strongly magnetic, very hard, and brittle. Occur in the kaolin and limonite, which are alteration products of a perthite and manganiferous magnetite. 90.45% Fe; 0.75% Mn; trace of Ni; 7.26% insoluble non-metallic residue. Total 98.46%.

Sp. gr. 7.26.

G.C. Hoffmann (1895, p. 24)

833. AWARUITE (NICKELIFEROUS METALLIC IRON). In the sand carried down the sluice boxes, Hoole Canyon, Pelly River, Yukon Territory.

105–G–W½ (Anal. R.A.A. Johnston) Ser. No. *1910–2*

Occurs in the form of irregularly shaped grains, some of which are more or less flattened, a few elongated into broad-like forms, and others cone-shaped. They occur with fine grains of magnetite and a pale reddish garnet. Pale yellowish tarnish, malleable, somewhat sectile, strongly

magnetic, and readily flattened into thin scales. The grains consist of: Fe 21.35%; Co 1.34%; Ni 74.34%; Cu 0.48%; P 0.08%; S 0.03%; insoluble 1.72%. Total 99.34%.
Sp. gr. 7.75.

R.A.A. Johnston (1911, p. 258)

834. **NATIVE ANTIMONY**. In calcite veins in magnetite; Dufferin Iron Mine, lot 18, con. 1, Madoc tp., Hastings co., Ont.

31–C–W½ (Anal. R.A.A. Johnston) Ser. No. *1900–1*

Occurs in bright tin-white lamellar masses showing brilliant cleavage surfaces irregularly scattered through veins of calcite traversing a body of very fine granular, compact, massive, greyish black magnetite. It also occurs in the form of delicate stringers and small patches and isolated particles in the magnetite itself, which is in immediate contact with the walls of the calcite veins.
Consisted of 99.89% Sb, 0.02% As, and a trace of Fe. Total 99.91%.

G.C. Hoffmann (1903, p. 13)

835. **GRAPHITE (FOLIATED)**. North half of lot 3, rge. 2, Grenville tp., Argenteuil co., Que.

31–G–E½ (Anal. G.C. Hoffmann) Ser. No. *1876–8*

Pure graphite is found in a lenticular mass, which appears to be separated from other masses of the same character by intervals in which the graphite becomes intermixed with limestone. The exposed faces of the laminae are tarnished with a reddish brown film, but contain very little foreign matter. The structure is massive, and dense; steel grey, with a light reddish brown ash. Analysis of ash given.

G.C. Hoffmann (1878, p. 503)

836. **GRAPHITE (VARIETY COLUMNAR)**. Lot 1, rge. 6, Grenville tp., Argenteuil co., Que.

31–G–E½ (Anal. G.C. Hoffmann) Ser. No. *1876–9*

Massive dense material made up of stout, narrow laminae, interlocking each other at such an angle as to present an almost columnar appearance. Dark steel grey, with a light reddish ash, analysis of which is given.

G.C. Hoffmann (1878, p. 504)

837. **GRAPHITE (VARIETY FOLIATED)**. Lots 21 and 22, rge. 7, Buckingham tp., Papineau co., Que.

31–G–W½ (Anal. G.C. Hoffmann) Ser. No. *1876–7*

Massive, dense material, made up of broad and thick laminae and containing here and there thin seams of foreign mineral matter. Dark steel grey with a light reddish brown ash, analysis of which is given.

G.C. Hoffmann (1878, p. 500)

	835	836	837	838	839
SiO_2	55.08	60.80	56.08	45.73	36.0
Al_2O_3	8.50	10.04	11.12	10.82	32.8
Fe_2O_3	18.31	16.72	13.27	1.23	11.2
FeO					
MgO	2.02	3.88	6.74	0.95	7.6
CaO	7.70	4.40	6.80	34.74	2.0
Na_2O	2.97	1.05	2.83	5.40	
K_2O	4.78	1.02	2.20	0.52	
Mn_2O_3	0.31	0.87	0.35	0.47	
NiO		trace	0.48		
CoO	) 0.12	) 0.30	) 0.33		
Co_2O_3					
CuO	1.16	1.94	0.66		
Total	100.95	101.03	100.86	99.86	89.6
Sp.gr.	2.2714	2.2659	2.2689	2.2679	

838. GRAPHITE (VARIETY COLUMNAR). Lot 27, rge. 6, Buckingham tp., Papineau co., Que.

31–G–W½ (Anal. G.C. Hoffmann) Ser. No. *1876–6*

The specimen is lenticular and contains a core of corresponding form consisting of orthoclase and calcite with very small quantities of quartz. The graphite is compact, columnar structure, breaking readily in the direction of the structure into more or less angular aggregates, each made up of thin, narrow foliae of uniform width. Foreign mineral matter was evenly distributed through the structure. Analysis of ash is given.

G.C. Hoffmann (1878, p. 501)

839. GRAPHITE. Lot 13, con. 8, Marmora tp., Hastings co., Ont.

31–C–W½ (Anal. R.A.A. Johnston) Ser. No. *1894–11*

Very fine granular massive material, greyish black and dull, assuming the lustre of graphite under the burnisher. It contained a little finely disseminated pyrite. Exposed surfaces in parts were coated with ferric hydrate. The separated graphite was greyish black, devoid of lustre, and apparently amorphous. The ash is brownish yellow to reddish brown, light and cellular. An analysis of this ash is given.

G.C. Hoffmann (1896, p. 12)

840. TETRADYMITE. 6 miles north of Liddell Creek, Kaslo River, West Kootenay district, B.C.

82–F–W½ (Anal. R.A.A. Johnston) Ser. No. *1895–52*

Tetradymite occurs with a little hessite intermixed with altaite. It has a foliated structure and a lead-grey to steel-grey colour, with occasionally a pale yellow tarnish, a metallic lustre, and shows a black streak.

G.C. Hoffmann (1897, p. 10)

841. BISMUTHINITE. Lot 21 of the north range of the road leading to Kaskouia, Jonquière tp., Chicoutimi co., Que.

22–D–W½ (Anal. R.A.A. Johnston) Ser. No. *1892–4*

A lead-grey, foliated, massive bismuthinite with metallic lustre. Occurs in a gangue composed of white and pale flesh-red, indistinctly laminated perthite, a more or less smoky quartz, a hair-brown muscovite with some black tourmaline, and brownish red spessartite from a coarse granite vein.

G.C. Hoffmann (1895, p. 20)

842. STROMEYERITE. In a replacement vein traversing the schistose eruptive rocks; Silver King Mine, Toad Mountain, West Kootenay district, B.C.

82–F–W½ (Anal. R.A.A. Johnston) Ser. No. *1895–51*

Stromeyerite is associated with bornite, chalcopyrite, pyrite, tetrahedrite, galena, sphalerite, and argentite, all of which are distributed through a gangue composed of a greyish feldspathic rock with a little quartz and calcite. The mineral is massive, compact, dark steel-grey, with a metallic lustre, subconchoidal fracture, and a dark grey streak.

G.C. Hoffmann (1897, p. 13)

	840	841	842[1]	843	844
S	4.30	18.46	15.74	3.95	
S combined				7.48	
Fe		0.74	0.17	0.29	0.63
Cu		0.48	31.60		
Zn				1.08	
Se	trace				
Ag	0.91		52.27	0.72	2.09
Sb				0.85	
Te	36.01				39.57
Au					0.01
Pb	3.50	1.68		72.19	49.72
Bi	51.85	79.28			
Th	trace				
H_2SO_4				12.61	
insoluble	3.52 (quartz)				7.84
Total	100.09	100.64	99.78	99.17	99.86
Sp.gr.	7.184	6.781	6.277		8.081

[1]Average of two analvses

843. **GALENA**. Ruceau Claim, Kaslo-Slocan Mining Camp, West Kootenay district, B.C.

82–F–W½ (Anal. R.A.A. Johnston) Ser. No. *1894–10*

Somewhat coarse-crystalline, sparkling galena, with a bright metallic lustre.

G.C. Hoffmann (1896, p. 11)

844. **ALTAITE**. Lakeview claim on the north side of Long Lake, Yale district, B.C.

82–E–E½ (Anal. R.A.A. Johnston) Ser. No. *1895–1*

Altaite is associated with hessite, native gold, thin plates of native copper and native tellurium, in a segregated quartz vein carrying chalcopyrite, pyrite, pyrrhotite, and chalcocite. It is massive, of a tin-white colour, with a bronze-yellow tarnish here and there, and a metallic lustre.

G.C. Hoffmann (1897, p. 11)

845. **PYRRHOTITE**. From a pyrite deposit; lot 19, rge. 2, Elizabeth tp., Leeds co., Ont.

31–B–W½ (Anal. B.J. Harrington) Ser. No. *1874–17*

Associated with about a dozen species of mineral including magnetite, quartz, talc, labradorite, phlogopite, black hydrate silicate of iron, alumina and magnesia, calcite, siderite, apatite, and cacoxenite. Pyrrhotite is sometimes massive, but more frequently occurs in acute rhombohedral crystals from a quarter of an inch or less up to several inches long, and generally embedded in calcite.

(a) - sample 1

(b) - sample 2 (Anal. J.L. Smith) Ser. No. *1874–16*

B.J. Harrington (1876, p. 306)

846. **STANNITE**. Snowflake Mine, Silver Creek, near Revelstoke, B.C.

82–L–E½ (Anal. R.J.C. Fabry) Ser. No. *1929–6*

A dark grey metallic mineral that occurred with sphalerite and pyrite in a quartz vein 4 feet wide. The sphalerite occurs as veinlets in the stannite, or as irregular areas in or away from it and contains many specks of chalcopyrite. The quartz is white, rather coarsely crystalline and fractured. In reflected light the stannite is greyish white with a brownish tinge and tarnishes to light brown in cold dilute nitric acid. Well-defined twinning laminae occur in several places.

H.C. Gunning (1929a, p. 186)

	845 (a)	845 (b)	846	847	848
SiO_2	0.04	1.01[1]		0.52	13.55[1]
Al_2O_3				0.51	
FeO				0.18	
MgO				0.18	
CaO				0.43	
S	39.02	39.24	29.76	52.43	14.34
Mn	0.06		nil		
Fe	60.56	59.88	3.65	45.19	6.78
Co	0.11			0.81	1.73
Ni	0.11		nil	0.14	22.59
Cu	0.15		31.56	trace	0.09
Zn			7.72		
As					40.31
Sn			26.65		
Total	100.05	100.13	99.34	100.39	99.39
Sp.gr.		4.642			6.231

[1]Gangue

847. PYRITE. Londonderry, N.S.

11–E–W½ (Anal. G.C. Hoffmann) Ser. No. *1874–14*

G.C. Hoffmann (1876, p. 316)

848. GERSDORFFITE. O'Connor claim on lot 12, rge. 3, Dennison tp., Sudbury district, Ont.

41–I–W½ (Anal. R.A.A. Johnston) Ser. No. *1890–2*

Steel grey, occasionally tarnished black, occurring with niccolite, chalcopyrite, and pyrrhotite, in a gangue consisting of an association of a light to dark green, fine-grained diabase with small quantities of a dark green chloritic schist, a little greyish white translucent quartz and a trifling amount of calcite. Structure is for the most part lamellar, occasionally granular, and a few minute fairly well developed crystals exhibiting the forms of the octahedron and cubo-octahedron were present.

G.C. Hoffmann (1892, p. 22)

849. COBALTIFEROUS LOELLINGITE. Lot 16, con. 14, Galway tp., Peterborough co., Ont.

31–D–E½ (Anal. R.A.A. Johnston) Ser. No. *1892–17*

Steel-grey, brittle mineral with metallic lustre and uneven fracture and a greyish black streak. Associated with a small quantity of pyrrhotite and a little white translucent quartz. Massive, exhibiting very little crystalline structure.

G.C. Hoffmann (1895, p. 19)

850. ARSENOPYRITE (MISPICKEL). Canada Consolidated Gold Mining Company, Marmora tp., Hastings co., Ont.

31–C–W½ (Anal. A. Carnot) Ser. No. *1883–14*

Auriferous mispickel was distributed in granular masses or embedded crystals through a gangue of quartz and calcite.

C.W. Willimott (1884, p. 12)

851. DANAITE (VARIETY OF ARSENOPYRITE). Evening Star Mine on the east slope of Monte Cristo Mountain, Trail Creek, West Kootenay district, B.C.

82–F–W½ (Anal. R.A.A. Johnston) Ser. No. *1895–3*

Silver-white mineral, sometimes exhibiting a crystalline structure. It is brittle, breaks with an uneven fracture and has a greyish black streak. It occurs in a gangue composed of fine- to coarse-crystalline calcite and a little intermixed quartz, and is accompanied by pyrrhotite, ordinary mispickel, and pyrite.

G.C. Hoffmann (1897, p. 13)

852. DANAITE (VARIETY OF ARSENOPYRITE). A deposit of nickeliferous pyrrhotite in diorite; north half of lot 6, rge. 3, Graham tp., Sudbury district, Ont.

41–I–W½ (Anal. R.A.A. Johnston) Ser. No. *1890–1*

Somewhat crystalline, granular, steel-grey mineral, intermixed with small quantities of white translucent quartz (subhedral type), a little galena, and a trifling amount of chalcopyrite.

G.C. Hoffmann (1892, p. 19)

	849	850	851	852	853
SiO_2	1.69[1]	1.50	3.86[1]	4.77[1]	5.57[1]
S	0.80	20.27	19.21	17.92	20.59
Fe	24.41	35.60	28.91	31.69	0.88
Co	2.85		2.97	3.89	
Ni	0.78			0.88	
Cu					21.03
Zn					5.91
As	70.11	42.00	46.41	40.16	0.22
Ag					10.64
Sb				0.57	26.81
Au				trace	
Pb					8.91
Total	100.64	99.37	101.36	99.88	100.56
Sp.gr.	7.028		6.166	5.988	

[1]Gangue

853. **TETRAHEDRITE.** Antelope Claim, Kaslo-Slocan Mining Camp, West Kootenay district, B.C.

82–F–W½ (Anal. R.A.A. Johnston) Ser. No. *1894–48*

Mainly pure, iron-grey mineral occurring in a gangue of white, opaque quartz. It is massive with an indistinct, fibrous structure. The lustre is metallic, acquiring a beautifully irised tarnish in shades of yellow, green, blue, and purple. The streak is dark clove-brown.

G.C. Hoffmann (1896, p. 12)

854. **ILMENITE.** Wolfe co., Que.

21–E–W½ (Anal. R.J.C. Fabry) Ser. No. *1931–4*

Massive.

(Unpublished data from Laboratory files)

855. **ANTIMONY OCHRE (STIBICONITE).** Lot 56, rge. 1, Ham tp., Wolfe co., Que.

21–E–W½ (Anal. R.A.A. Johnston) Ser. No. *1894–1*

Occurred as a wine-yellow, earthy encrustation on a specimen of stibnite.

G.C. Hoffmann (1896, p. 9)

856. **URANINITE.** From a pegmatite body; on a line between lots 9 and 10, Conger tp., near a bay on Blackstone Lake, Parry Sound district, Ont.

31–E–W½ (Anal. H.V. Ellsworth) Ser. No. *1932–45*

Uraninite occurs as scattered crystals in the feldspathic parts of a pegmatite body composed of massive white quartz and mixed quartz,

	854	855
SiO_2	1.46	
Al_2O_3	1.91	1.02
Fe_2O_3	23.36	2.82
FeO	33.67	
MgO	0.14	0.61
CaO	2.37	5.71
H_2O+	0.44	) 9.46
H_2O-	0.06	
TiO_2	33.92	
MnO	0.29	
V_2O_3	1.56	
Cr_2O_3	1.10	
As_2O_3		7.88
Sb_2O_4		58.86
insoluble (quartz)		13.39
Total	100.28	99.75

feldspar, and mica, particularly in association with stringers and aggregates of thin muscovite crystals. The uraninite crystals vary from ⅛ to 1 inch in diameter, are cubic, and show only a small development of the octahedron. It is fresh, unusually hard and heavy, almost steel-grey, has a metallic lustre, and breaks with uneven fracture.

H.V. Ellsworth (1932, p. 268)

857. URANINITE. In a dyke cutting highly deformed pyroxenic gneiss; lot 6, con. 2, March tp., Carleton co., Ont.

31–G–W½ (Anal. H.V. Ellsworth) Ser. No. *1932–50*

Occurs very sparingly as nodules not exceeding ½ inch in diameter, in the crystals of microcline. Uraninite is not sharply crystallized. It is black, with conchoidal fracture, showing it has undergone the initial stage of alteration. The dyke consists of microcline with quartz and considerable black mica, black tourmaline, and magnetite in places, with small amounts of calcite and fluorite.

H.V. Ellsworth (1932, p. 268)

858. URANINITE. In a pegmatite body composed of massive white quartz, feldspar, and mica; on a line between lots 9 and 10, con. 9, Conger tp., near a bay on Blackstone Lake, Parry Sound district, Ont.

31–E–W½ (Anal. H.V. Ellsworth) Ser. No. *1932–46*

Uraninite occurs in the form of crystals predominantly cubic with small octahedral faces, often very fresh, unusually hard and heavy, almost steel-grey with a metallic lustre. Breaks with uneven fracture. It occurs particularly in association with stringers in aggregates with thin mica crystals.

H.V. Ellsworth (1932, p. 268)

859. URANINITE. Lot 4, con. 21, just east of Wilberforce, Cardiff tp., Haliburton co., Ont.

31–E–E½ (Anal. H.V. Ellsworth) Ser. No. *1924–28*

Crystals of uraninite up to an inch in diameter, also massive forms, associated with magnetite and mica were found in pegmatite facies of a mass of syenite. Crystals are cubic in habit with only small development of the octahedron. They are severely altered, giving the greenish colour of U_3O_8 when powdered, and thin films of a yellowish decomposition product in places penetrate cracks in the uraninite and also form a coating on cleavages of fissures in magnetite and other neighbouring minerals.

H.V. Ellsworth (1924, p. 20)

	856	857	858	859	860
SiO_2	0.29	0.64	0.35	0.58	0.19
Al_2O_3	0.03	0.05	0.02	0.11	0.09
BeO					
Fe_2O_3	0.15	0.37	0.27	0.47	0.43
MgO	0.02	0.11	0.03	0.07	0.08
CaO	0.41	1.56	0.4	0.25[1]	1.01
Na_2O			0.23	present	
K_2O			trace		
H_2O+	0.72	1.33	0.74	0.11	0.65
H_2O-		0.22		1.49	0.05
TiO_2				trace	
P_2O_5				0.04	
MnO	0.01	0.02	0.03	trace	0.03
CO_2				0.67	
SO_3				0.58	
He	0.37				0.31
loss on ignition				(4.42)	
insoluble	0.13	0.16	0.17	0.67	0.15
$(Ce,La,Di)_2O_3$	0.98	2.10	0.44	1.85[1]	1.88
$(Yt,Er)_2O_3$	2.19	2.30	2.31	1.24[1]	2.14
ThO_2	3.22	4.92	3.55	13.56	10.60
UO_2	53.63	49.44	51.27	13.55	39.10
UO_3	26.32	24.28	28.37	52.04	32.40
PbO	11.67	11.61	11.60	11.05	10.95
Total	100.14	99.11	99.85 (99.78)	98.33	100.06
Sp.gr.	9.116	8.674	9.026		9.062

[1]Certain constituents re-determined in 1927 (analysis done in 1923)

860. **URANINITE.** From a pegmatitic dyke; lot 4, con. 21, 1½ miles east of Wilberforce Station, Cardiff tp., Haliburton co., Ont.

31–E–E½ (Anal. H.V. Ellsworth) Ser. No. *1932–49*

Very pure, hard uraninite crystals, embedded in solid feldspar. The crystals are well formed, predominantly cubic, the largest nearly 2 inches in diameter. The feldspar is pinkish to reddish and is the chief constituent of the pegmatitic dyke. Uraninite occurs as irregular masses intergrown with magnetite.

H.V. Ellsworth (1932, p. 268)

861. **URANINITE.** In a pegmatite body composed of massive white quartz and mixed quartz, feldspar, and mica; on a line between lots 9 and 10, con. 9, Conger tp., near a bay on Blackstone Lake, Parry Sound district, Ont.

31–E–W½ (Anal. H.V. Ellsworth) Ser. No. *1932–47*

Uraninite occurs in the form of crystals, which are predominantly cubic with small octahedron faces. They are often very fresh, unusually hard and heavy, almost steel-grey with a metallic lustre, and break with uneven fracture. Crystals having undergone the first stage of alteration are black with a sub-metallic lustre and conchoidal fracture.

H.V. Ellsworth (1932, p. 268)

862. **URANINITE.** In a granite pegmatite of the segregated type carrying considerable muscovite and masses of white quartz and pink feldspar; south half of lot 13, con. 7, Butt tp., Nipissing district, Ont.

31–E–E½ (Anal. H.V. Ellsworth) Ser. No. *1932–48*

A few scattered grains of uraninite up to ½ inch in diameter occur in areas of a granular mixture of deep red feldspar, smoky quartz, and small books of white mica.
(a) good quality single crystal;
(b) mixed fragments;
(c) mixed fragments;
(d) single crystal: altered.

	861	862 (a)	862 (b)	862 (c)	862 (d)
SiO_2	1.36	0.31	1.02	0.36	2.04
Al_2O_3 & BeO	0.11	0.08	0.03	0.10	0.07
Fe_2O_3	0.91	0.40	0.53	0.62	0.86
MgO	0.17	0.07	0.03	0.04	0.03
CaO	1.40	1.18	1.50	0.98	1.35
H_2O+	1.08	0.35	1.33	0.34	1.20
H_2O-	0.45	0.26		0.40	0.72
MnO	0.04	0.12	0.21	0.06	0.16
F		present		present	
insoluble	0.14	0.35	1.40	2.27	0.43
$(Ce,La,Di)_2O_3$	0.78	5.02	2.71	0.96	
$(Yt,Er)_2O_3$	1.90		2.77	4.02	5.58
ThO_2	3.35	1.56	1.83	1.23	1.13
UO_2	38.05			43.33	
UO_3	39.13			33.42	
U_3O_8		79.48	76.87		75.74
PbO	10.52	10.80	9.84	10.58	10.36
Total	99.39	99.98	100.07	98.71	99.67
Sp.gr.		8.859		8.788	

863. **URANINITE.** Villeneuve Mine, lot 31, rge. 1, Villeneuve tp., Papineau co., Que.

31–G–W½ (Anal. H.V. Ellsworth) Ser. No. *1932–56*

A large mass of uraninite the size of a cannon ball, showing the whole sequence of alteration products in zonal fashion:
(a) nearest the centre of the original mass the material was least altered, steely black, with more or less metallic lustre and uneven fracture;
(b) second stage of alteration, pitch black with non-metallic lustre, conchoidal fracture;
(c) beautiful bright red substance with waxy lustre, brittle and conchoidal fracture, mostly anisotropic, but not entirely homogeneous.
The final stage of alteration formed irregular layers seldom more than 1 mm thick, evidently outside of the original uraninite mass, and in contact with the rocky matrix. It was buff-yellow to apricot-yellow with waxy lustre, brittle with conchoidal fracture, and anisotropic with index less than 1.75. Not enough of this material was available to allow an analysis.

H.V. Ellsworth (1932, p. 272)

864. CORACITE. Forms a vein about 2 inches wide at the junction of trap and syenite; Mamainse, Lake Superior-Thunder Bay district, Ont.

41–N–E½ (Anal. J.D. Whitney) Ser. No. *1863–45*

Geological Survey (1863, p. 504)

	863 (a)	863 (b)	863 (c)	864
SiO_2	0.21	0.34	3.81	4.35
Al_2O_3 + Fe_2O_3	0.18	0.13	0.14	
Al_2O_3				0.90
Fe_2O_3				2.24
MgO	0.03	0.02	0.12	traces
CaO	0.36	0.42	1.37	14.44
H_2O	1.70	5.97	9.42	4.64
H_2CO_3				7.47
$(Ce,La,Di)_2O_3$	0.79	0.68	0.14	
$(Yt,Er)_2O_3$	3.31	2.97	1.61	
ThO_2	6.40	6.23	7.66	
UO_2	41.08	9.49	nil	
UO_3	34.98	62.42	60.36	
total U				59.30
PbO	11.43	10.73	14.93	5.36
(Pb)	(10.61)	(9.96)	(13.85)	
(total Th)	(5.63)	(5.48)	(6.73)	
(Th–U equivalent)	(2.14)	(2.08)	(2.56)	
(total U)	(65.34)	(60.33)	(50.24)	
(As U_3O_8)	(77.03)	(71.13)	(59.24)	
Total	99.47 (100.47)	99.40	99.56	98.70
Sp.gr.	9.144	7.778	5.275	4.38

865. HYDROTALCITE. Vimy Ridge, Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1928–3*

(Unpublished data from Laboratory files)

866. TITANIFEROUS MAGNETITE. Occurs in diabase dyke; Gowganda Mining Division, Timiskaming district, Ont.

41–P–E½ (Anal. M.F. Connor) Ser. No. *1913–25*

Good crystals are not often observable but skeletal forms showing triangular lamellation of ilmenite are not uncommon. Weathering produces an opaque white leucoxene.

W.H. Collins (1913, p. 70)

867. KNOPITE (VARIETY PEROVSKITE). In a fairly coarse pegmatite composed essentially of hornblende, biotite, and magnetite; Moose Creek, southeast of, and about 26 miles by trail from, Leanchoil, Kootenay district, B.C.

82–O–W½ (Anal. H.V. Ellsworth) Ser. No. *1926–23*

	865	866	867	868
SiO_2	3.92	9.34	2.17	
Al_2O_3	21.08	2.77	0.68	
Fe_2O_3		30.91	2.85[1]	
FeO		31.16		4.83
MgO	34.79	0.90	0.21	0.11
CaO	trace	5.40	35.10	5.38
Na_2O			0.46	0.23
K_2O			0.07	0.39
H_2O+	32.25	1.29	0.68	2.21
H_2O-		0.08		
TiO_2		17.40	54.49	
MnO			0.08	0.51
CO_2	8.51			
F				trace
SrO_2			0.04	0.10
Nb,Ta. oxides				55.41[2]
insoluble	0.13			
$(Ce,La,Di)_2O_3$			0.06	4.78
$(Yt,Er)_2O_3$			2.33	14.34
ThO_2			0.05	
UO_3				10.75
Total	100.68	99.75 (99.25)	99.27	99.04
Sp.gr.				4.978

[1]Total iron as Fe_2O_3

[2]Largely, if not entirely, as Nb oxide

Knopite occurs in small bunches up to 2 or 3 inches in diameter, and forms a very small percentage of the rock. The hand specimen was an irregular fragment having the general appearance of magnetite but a more brilliant lustre, and was a very intimate intergrowth of two or more minerals. The ground mass consisted of a uniform mixture of the two and was penetrated by veinlets of magnetite. The non-magnetic knopite was separated from the magnetic magnetite and grains of rock material, and was analyzed.

H.V. Ellsworth and J.F. Walker (1926b, p. 230)

868. SAMARSKITE. Maisonneuve Mine, lots 1 and 2, rge. 2, Maisonneuve tp., on a roadside south of the outlet of a small lake called Mica Lake, Berthier co., Que.

31–J–E½ (Anal. G.C. Hoffmann) Ser. No. 1880–13

Irregular shaped fragments without any indication of crystalline form, with shiny sub-metallic lustre and uneven fracture. Brownish black to almost black, in parts iridescent, and opaque even on the thinnest edges. It was brittle, with a greyish brown streak.

G.C. Hoffmann (1883, p. 1)

869. ROCK SALT. Interbedded with thin lenticular layers of clay and overlain by gypsiferous sediments; from a layer 16 to 17 feet deep, at the shaft at Malagash, Cumberland co., N.S.

11–E–W½ (Anal. F. Baridon) Ser. No. *1920–28*

A.O. Hayes (1920, p. 9)

870. ROCK SALT. Interbedded with thin lenticular layers of clay and overlain by gypsiferous sediments; at the shaft at Malagash Point, Cumberland co., N.S.

11–E–W½ (Anal. F. Baridon) Ser. No. *1920–27*

A.O. Hayes (1920, p. 9)

871. ROCK SALT. Interbedded with thin lenticular layers of clay and overlain by gypsiferous sediments; from the layer on the top to a depth of 8 feet, Malagash shaft, Cumberland co., N.S.

11–E–W½ (Anal. F. Baridon) Ser. No. *1920–26*

A.O. Hayes (1920, p. 9)

872. ROCK SALT. 20 feet north of the shaft, Malagash salt deposit, Cumberland co., N.S.

11–E–W½ (Anal. H.V. Ellsworth) Ser. No. *1924–17*

Pure-looking bed of rock salt 4 feet thick, almost pure white except for a slight brownish tinge, non-hygroscopic.

H.V. Ellsworth (1926a, p. 189)

	869	870	871	872
	(a) part insoluble in hot water			
SiO_2	0.61	21.85	1.60	
Al_2O_3 & Fe_2O_3	0.31	7.90	0.77	
MgO	0.07	2.15	0.19	
CaO	0.06	0.25	0.06	
Na_2O		0.93	0.09	
SO_3	0.10	0.22		
organic	0.25	2.06	0.30	
Total	1.40	35.36	3.01	0.48
	(b) part soluble in hot water			
Na	38.57	23.15	37.42	38.55[1]
K	0.17	0.16	0.14	0.43
Mg	0.01	0.06	0.03	trace
Ca	0.18	0.81	0.31	0.20
SO_4	0.64	3.05	1.07	0.47
Cl	59.58	35.85	57.85	59.78
Br	} nil			0.02
I				
Total	100.55	98.44	99.83	99.93

[1]By difference

873. ROCK SALT. First of a series of 1-foot samples taken normal to the dip from the top to the bottom of the potash-bearing strata, Malagash salt deposit, Cumberland co., N.S.

11–E–W½ (Anal. H.V. Ellsworth) Ser. No. *1924–12*

Salts readily soluble in water - 93.56%. Insoluble, washed free of chloride but containing anhydrite - 6.44%.

H.V. Ellsworth (1926a, p. 186) *See also* Nos. 874, 875, 876 *(1924–13, 14, 15)*

874. ROCK SALT. Second of a series of 1-foot samples taken normal to the dip from the top to the bottom of the potash-bearing strata, Malagash salt deposit, Cumberland co., N.S.

11–E–W½ (Anal. H.V. Ellsworth) Ser. No. *1924–13*

The potash horizon contains small amounts of potash in disseminated form, together with occasional small lenses of pale yellow, crystalline, almost pure sylvite. The potash strata are coloured red, probably due to microscopic hematite scales. Sylvite lenses are only associated with the

red strata of which the maximum width is 25 feet. Salts from these red zones are somewhat hygroscopic.
Salts readily soluble in water - 97.90%. Insoluble, washed free of chloride, but containing anhydrite - 2.10%.

H.V. Ellsworth (1926a, p. 187) *See also* Nos. 873, 875, 876 *(1924–12, 14, 15)*

	873	874	875	876
	(a) part insoluble in water			
SiO_2	57.11	43.78	47.43	
Al_2O_3	13.18	11.78	13.04	
Fe_2O_3	4.75	2.99	4.49	
FeO	nil			
MgO	6.50	5.96	5.98	
CaO	3.30	10.85	8.02	
Na_2O	0.18	0.12	0.23	
K_2O	1.83	1.68	2.16	
H_2O+	4.04	) 4.31	) 5.20	
H_2O-	0.71			
TiO_2	0.69	0.62	0.66	
P_2O_5	0.10			
MnO	0.06	0.06	0.10	
CO_2	1.32	1.28	1.03	
SO_3	4.15	14.36	11.17	
Cl	0.03			
C	1.09	present	present	
Cr_2O_3	0.08[1]			
H_2S group metals	trace[2]			
Total	99.12	97.79	99.51	
	(b) Part soluble in water			
Na (diff)	37.12	37.47	38.61	37.96
K	1.66	1.85	0.27	0.49
Mg	0.02	0.01	0.01	0.10
Ca	0.47	0.21	0.27	0.65
H_2O	0.45	0.32	0.23	0.46
CO_3	trace	trace	trace	trace
SO_4	1.04	0.49	0.61	1.39
Cl	59.21	59.64	59.98	58.93
Br	0.03	0.01	0.02	0.02
Total	100.00	100.00	100.00	100.00

[1]Possibly from blasting
[2]Cu?

875. ROCK SALT. From the lowest accessible part of the potash-bearing horizons, Malagash salt deposit, Cumberland co., N.S.

11–E–W½ (Anal. H.V. Ellsworth) Ser. No. *1924–14*

Description same as No. 874.
Salts readily soluble in water = 97.23%. Insoluble, washed free of chloride but containing anhydrite = 2.77%.

H.V. Ellsworth (1926a, p. 188) *See also* Nos. 873, 874, 876 *(1924–12, 13, 15)*

876. ROCK SALT. Last of a series of 1-foot samples taken normal to the dip from the top to the bottom of the potash-bearing strata, potash-bearing horizon, Malagash salt deposit, Cumberland co., N.S.

11–E–W½ (Anal. H.V. Ellsworth) Ser. No. *1924–15*

Description same as No. 874.
Salts readily soluble in water = 88.89%. Water soluble part = 11.11%.

H.V. Ellsworth (1926a, p. 189) *See also* Nos. 873, 874, 875 *(1924–12, 13, 14)*

877. SYLVITE. Malagash salt deposit, Cumberland co., N.S.

11–E–W½ (Anal. H.V. Ellsworth) Ser. No. *1924–16*

Pale yellow crystalline, almost pure sylvite occurs in small lenses in a potash-bearing horizon of the Malagash salt deposit.

H.V. Ellsworth (1926a, p. 189)

	877	878
Mg	0.01	
Ca	0.02	
$CaSO_4$		0.15
NaCl	6.48	
Na_2SO_4		0.27
KCl	92.89	
K_2SO_4		0.04
H_2O	0.29	
H_2SO_4		0.01
S		46.52
SO_4	0.03	
Br	0.10	
I	nil	
NH_4Cl		50.42
$(NH_4)_2SO_4$		1.81
extraneous		0.93
insoluble	0.12	
Total	99.94	100.15

878. SAL AMMONIAC. Forms a deposit on a cliff of shale on the Smoky River, Alta.

83–N–W½ (Anal. G.C. Hoffmann) Ser. No. *1875–9*
or
84–C–W½

The specimen varied in colour from canary-yellow to white and was opaque with a saline and pungent taste. It was fine to coarse granular with some of the larger fragments showing a distinctly fibrous structure.

G.C. Hoffmann (1877, p. 420)

879. CALCITE. In fissures near 'trouble' in the bituminous coal of the Cumberland seam; at Joggins, Cumberland co., N.S.

21–H–E½ (Anal. H.J. Harrington) Ser. No. *1877–11*

The calcite is a manganiferous variety deposited on both walls of the fissures, either entirely filling them, or leaving cavities in the centre. Fragments of coal were enclosed in the vein. The calcite was white and translucent and apparently made up of an aggregation of imperfectly formed nailhead crystals.

B.J. Harrington (1879, p. 38)

880. CALCITE. Veins at the eastern Bonanza (El-Bonanza) deposit at Dowdell Point, McTavish Arm, Great Bear Lake, District of Mackenzie.

86–K–W½ (Anal. ?) Ser. No. 1936–20

Coarsely crystalline, white to pale grey calcite from a fluorite and silver-bearing vein. The native silver occurs in rectangular dendritic patterns on the cleavage faces of the carbonate, and the fluorite is purple.

D.F. Kidd (1936, p. 40) *See also* No. 881 *(1936–19)*

	879	880	881	882	883
SiO_2					
Al_2O_3		0.06	2.76		1.39
Fe_2O_3		0.36	3.06		1.92
FeO			0.29		5.73
MgO		0.07	0.56		9.91
CaO		45.90	41.50		27.17
MnO		0.13	3.18		11.53
CO_2		36.05	35.38		42.91
metals			1.14		
insoluble		17.34	10.96	26.72	0.94
$FeCO_3$	1.10			3.23	
$MgCO_3$	trace			11.76	
$CaCO_3$	96.64			56.60	
$MnCO_3$	1.95				
Total	99.69	99.91	98.83	98.31	101.50

881. CALCITE. Western Bonanza deposit, Dowdell Point, McTavish Arm, Great Bear Lake, District of Mackenzie.

86–K–W½ (Anal. ?) Ser. No. *1936–19*

White carbonate, with light brown and greenish carbonate, makes up veinlets, which frequently fill fractures in the Dowdell Point rocks. It frequently shows numerous wires of native silver, small specks of chalcopyrite, niccolite, or bornite, and at least two soft grey minerals were found to accompany the silver.

D.F. Kidd (1936, p. 39) *See also* No. 880 *(1936–20)*

882. LIMESTONE. Fissure fillings in a bed of grey fossiliferous limestone; Dudswell, Wolfe co., Que.

21–E–W½ (Anal. T.S. Hunt) Ser. No. *1857–5*

Yellow magnesium limestone forms layers sometimes ½ inch thick, occasionally enclosing the fragments of grey limestone.

T.S. Hunt (1859, p. 200)

883. CALCITE. In a vein 12 to 20 inches wide cementing a zone of shearing and fracturing in a massive, medium-grained granodiorite or quartz diorite that forms part of an elongated stock; north shore of Contact Lake, 5 miles southeast of Cameron Bay settlement in Echo Bay, Great Bear Lake, District of Mackenzie.

86–F–E½ (Anal. ?) Ser. No. 1936–18

A white, coarsely crystalline manganiferous calcite occurs on the quartz crystals (up to an inch) that line the cavity of the vein. The principal vein filling is a manganiferous pink carbonate, which invades and replaces quartz (*see* No. 891). The mineralogy of the vein is complex, the following metallic minerals having been found in the vein and wall-rock: pyrite, magnetite, hematite, arsenopyrite, pitchblende, safflorite-rammelsbergite, skutterudite, cobaltite, glaucodot, niccolite, native bismuth, chalcopyrite, tetrahedrite, bornite, chalcocite, covellite, argentite, stromeyerite, hessite, native silver, and polybasite (?).

D.F. Kidd (1936, p. 39)

884. MAGNESITE. Occurs in association with serpentinized peridotite (Schulaps volcanics); northwest end of Liza Lake, Bridge River map-area, Lillooet district, B.C.

92–J–W½ (Anal. D.M. Stewart) Ser. No. *1916–17*

Dolomitic crystalline magnesite occurs as anastomosing veinlets of magnesite and chalcedonic quartz, or as a massive variety. The veinlets are composed mostly of chalcedony and magnesite, either irregularly mixed together throughout the veinlet or as typical crustification bands.

The magnesite rarely occurs without chalcedony. In the massive varieties the magnesite is vuggy, the spaces being filled with chalcedony. The chalcedonic parts stand out in relief compared with the more easily weathered magnesite. A peculiar nodular structure is sometimes observed on weathered surfaces.

C.W. Drysdale (1917, p. 49)

885. **MAGNESITE**. International Magnesite Company Ltd. property, lot 13, rge. 1, Harrington tp., Argenteuil co., Que.

31–G–E½ (Anal. J.T. Donald and Co.) Ser. No. *1917–3*

The material consists of glistening white magnesite and medium- to coarse-grained grey material containing disseminated grains of dark green serpentine.

M.E. Wilson (1917, p. 38)

886. **MAGNESITE**. Occurs in association with serpentinized peridotite; northwest end of Liza Lake, Bridge River map-area, Lillooet district, B.C.

92–J–W½ (Anal. D.M. Stewart) Ser. No. *1916–11*

A massive variety of magnesite. Occurs in both veins and irregular masses of various sizes and degrees of purity. It is vuggy, the spaces being filled with chalcedony. The chalcedonic parts stand out in relief compared with the more easily weathered magnesite. A peculiar nodular structure is sometimes observed on weathered surfaces.

C.W. Drysdale (1916, p. 49) *See also* No. 884 *(1916–17)*

887. **MAGNESITE**. Associated with serpentinized peridotite (Schulaps volcanics); northeast side of the valley near Liza Lake, Bridge River map-area, Lillooet district, B.C.

92–J–W½ (Anal. N.L. Turner) Ser. No. *1916–10*

	884	885	886	887	888 (a)
SiO_2	4.08	1.60	4.08	7.46	4.54
Al_2O_3	0.92	) 1.81	0.59	0.23	0.40
Fe_2O_3	1.64		0.95	0.25	2.40
FeO				0.56	0.79
MgO	28.14	39.25	42.20	43.42	43.70
CaO	18.48	7.89	3.25	0.46	
H_2O+				0.58	
H_2O-				0.10	
CO_2	45.18		48.55	47.28	
loss on ignition		49.72			48.00
Total	98.44	100.27	99.62	100.34	99.83

Magnesite, siliceous and ferruginous, is admixed with varying quantities of calcite and a green chromiferous silicate (possibly mariposite). The silica is deposited as chalcedony in veinlets and vugs.

C.W. Drysdale (1916, p. 49)

888. MAGNESITE. Old Town Formation, from a belt composed of crystalline magnesite and impure magnesite interbedded with quartzite and argillaceous sediments and, at one point, limestone; 1½ miles south and 1,000 feet above St. Mary River, near the western border of the Cranbrook quadrangle, B.C.

82–F–E½ (Anal. Mines Branch) Ser. No. *1932–26*

Represents a width of 18 feet of magnesite. The purer magnesite varies from coarse to finely crystalline, weathers rough and is commonly coated rusty brown. Fresh surfaces are pearly grey, white and cream and may be traversed by irregular, small veins or veinlets of quartz or may contain small knots of quartz. In general the deposit seems relatively free of visible impurities.

(a) = sample No. 388 R;
(b) = sample No. 330.

C.E. Cairnes (1933, p. 103)

889. MAGNESITE. Lot 12, rge. 7, Sutton tp., Brome co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1856–15*

White crystalline magnesite is associated with the dolomites and steatites of the area and is intermingled with grains of a feldspathic mineral and scales of a bright green talc, which predominate in certain planes and give to the bed a gneissoid structure. Small grains of pyrite are disseminated through the mass.
(a) analysis of the first fragment of material;
(b) analysis of another fragment of the material; insoluble residue = feldspar.

T.S. Hunt (1857c, p. 461)

	888 (b)	889 (a)	889 (b)	890 (a)	890 (b)
SiO_2	4.40				
Al_2O_3	0.66		0.50		
Fe_2O_3	1.44				
MgO	44.80				
CaO	0.73				
loss on ignition	48.30				
insoluble		8.03	45.90	32.20	29.90
$FeCO_3$		9.02	19.35	8.32	10.31
$MgCO_3$		83.35	33.00	59.13	59.72
Total	100.33	100.40	98.75	99.65	99.93

890. **MAGNESITE.** From a bed many yards wide interstratified between steatite and impure serpentine which passes into diorite; lot 17, rge. 9, Bolton tp., Brome co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1856–16*

The magnesite resembles a crystalline limestone and is made up of strongly coherent cleavable grains, whitish or bluish grey, weathering rusty red, with grains and small irregular veins of hyaline quartz. Small grains of pyrite, small portions of a green chromiferous silicate, and occasionally a little carbonate of lime are present.

(a) - first sample;

(b) - second sample.

T.S. Hunt (1857c, p. 462)

891. **CARBONATE.** From a vein 12 to 20 inches wide cementing a zone of shearing and fracturing in a massive, medium-grained diorite or quartz diorite; north shore of Contact Lake, .5 miles southeast of Cameron Bay settlement, Echo Bay, Great Bear Lake, District of Mackenzie.

86–F–E½ (Anal. ?) Ser. No. *1936–17*

Pink manganiferous carbonate is the principal mineral of the vein and invades and replaces quartz, which is of at least two ages. Irregular masses of red to pale grey, cherty quartz occur in the pink carbonate. Where the pink carbonate does not fill the vein, late quartz crystals up to an inch long line the remaining cavity. At their bases is a narrow, red hematitic band, and on the quartz crystals themselves a white, coarsely crystalline manganiferous calcite occurs (No. 883). The mineralogy is complex. The following minerals have been found in the wall-rocks: pyrite, magnetite, hematite, arsenopyrite, pitchblende, safflorite-rammelsbergite, skutterudite, cobaltite, glaucodot, niccolite, native bismuth, chalcopyrite, tetrahedrite, bornite, chalcocite, covellite, argentite, strommerite, hessite, native silver, and polybasite (?). The pink carbonate contains chalcopyrite, bornite, and a silver mineral in the form of scattered blebs.

D.F. Kidd (1936, p. 38)

892. **STRONTIANITE.** In veins traversing Chazy limestone; lot 31, con. A, Nepean tp., Carleton co., Ont.

31–G–W½ (Anal. R.A.A. Johnston) Ser. No. *1892–51*

The mineral entirely fills the veins and has radiating crystalline massive structure. It is pale yellow and green shading into white and is translucent.

G.C. Hoffmann (1895, p. 23)

893. **DOLOMITE.** Vein along a fractured zone 6 inches to 3 feet wide cutting volcanics; How claims 4 and 5, north bank of the Camsell River, District of Mackenzie.

86–F–W½ (Anal. Mines Branch) Ser. No. *1936–14*

The vein comprises a network of carbonate veinlets individually up to 8 inches wide. The principal gangue mineral is a manganiferous dolomite. Residuals of an earlier quartz gangue are seen under the microscope. The metallic minerals are pyrite, chalcopyrite, galena, native bismuth, argentiferous bismuthinite, and native silver. Native bismuth, argentiferous bismuthinite, and galena occur intimately associated in masses along cleavage planes in the carbonate.

D.F. Kidd (1936, p. 33)

894. **DOLOMITE.** A vein lying in diabase, which is a fractured zone; White Eagle Silver Mine, north bank of Camsell River, 9 miles east of the mouth of the river in Conjuror Bay, District of Mackenzie.

86–F–W½ (Anal. Mines Branch) Ser. No. *1936–13*

Manganiferous dolomite, pale pink, very coarsely crystalline in places, with cleavage surfaces up to 3 inches long, occurring in a vein 1 inch to 3 or 4 feet wide, together with quartz of at least two generations. The following primary metallic minerals are present: pyrite, arsenopyrite, chalcopyrite, sphalerite, galena, native bismuth, bismuthinite, safflorite-rammelsbergite, hematite, native silver, and argentite. The vein in many places exhibits banding and crustification. Where complete the section has an outermost band of manganiferous dolomite against the wall-rock, and adjoining this band, and often having an indefinite contact with it, is a fine-grained white to pink, opaque, quartz band of variable width.

	891	892	893	894	895
SiO_2					
Al_2O_3	1.15		1.06	0.12	4.78
Fe_2O_3	3.80		0.97	0.69	
FeO	10.86		1.06	1.16	
MgO	5.24		16.88	14.96	15.27
CaO	6.40	3.38	29.87	24.93	24.01
H_2O					1.04
MnO	27.06		2.89	2.12	0.10
CO_2	34.22		44.48	38.08	36.06
SrO		65.43			
H_2CO_3		30.54			
insoluble	10.76	0.17	2.74	17.52	19.10
Total	99.49	99.52	99.08 (99.95)	99.58	100.36
Sp.gr.		3.704			

Pink dolomite is the most abundant self-central filling, but a white coarsely crystalline carbonate or later quartz may also occur. Rock fragments are included.

D.F. Kidd (1936, p. 31)

895. **DOLOMITE**. From the shear zone of the fault crossing St. Francis River about 9,000 feet northeast of the west end of the bridge at Richmond, Richmond co., Que.

31–H–E½ (Anal. R.J.C. Fabry) Ser. No. *1948–3*

Pinkish carbonate.

H.C. Cooke (1950, p. 121)

896. **DOLOMITE**. Cast of an *Orthoceras* in beds of Trenton Limestone; Ottawa, Carleton co., Ont.

31–G–W½ (Anal. T.S. Hunt) Ser. No. *1852–1*

Fossil casts are abundant and coarsely crystalline. They are white or bluish white within. Upon the weathered surfaces of the rock they appear in high relief and are reddish brown externally.

T.S. Hunt (1854, p. 174)

897. **DOLOMITE**. Occurs as irregular interrupted layers occasionally an inch or more thick between beds of dark compact fossiliferous limestone; quarries near St. Lawrence toll-gate, Montreal, Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1857–3*

A yellow pulverulent material.

T.S. Hunt (1858, p. 198)

898. **NATRON**. Collected from the stockpile in the southwest end of Meadow Lake, on the shore of Goodenough Lake, 28 miles north of Clinton. Lillooet district, B.C.

92–P–W½ (Anal. F. Baridon) Ser. No. *1920–24*

The specimen probably represents the salt in an intermediate stage in the conversion from natron to thermonatrite, a carbonate with less water.

L. Reinecke (1920, p. 59)

899. **NATRON**. A deposit covering the bottom of the lake and which has an area of about 20 acres to a depth of from 7½ to 8½ inches except at the edges where it is about 2 inches; Goodenough Lake, 28 miles due north of Clinton, Lillooet district, B.C.

92–P–W½ (Anal. R.A.A. Johnston) Ser. No. *1898–5*

Translucent and perfectly colourless, except at and a little above the contact with the underlying clayey stratum, where it is a faint greenish white.

G.C. Hoffmann (1900, p. 13)

	896	897	898	899
SiO_2			trace	0.01
R_2O_3			trace	
MgO			0.04	
Na_2O			31.36	21.36
K_2O			trace	
H_2O+			0.84	63.03
H_2O-			45.67	
P_2O_5				0.01
CO_2			22.08	15.46
SO_3			0.11	0.08
Cl			trace	0.01
B_2O_3				trace
insoluble		9.01		
$FeCO_3$	5.95	27.03		
$MgCO_3$	37.80	24.19		
$CaCO_3$	56.00	40.95		
Total	99.75	101.18	99.90 (100.10)	99.96

900. HYDROMAGNESITE. Deposit in the immediate vicinity of the 108-mile house on the Cariboo Road, 93 miles north of Ashcroft, at Watson Lake, Lillooet district, B.C.

92–P–W½ (Anal. R.A.A. Johnston) Ser. No. *1898–4*

Pure white, more or less firmly compacted, readily friable material consisting of an aggregate of very fine crystalline particles with a few delicate intermingled rootlets. The deposit consecutively includes a 5-foot layer of pure white material, 6 inches of yellowish material, 3 feet of pure white material, 18 inches of yellowish material, a thin layer of pure white material, and a dark coloured mud forming the bed, which contains a few well-preserved shells.

G.C. Hoffmann (1900, p. 11)

901. HYDROMAGNESITE. Forming a thin flat-lying sheet of nearly uniform depth at the east end, Watson Lake, 40 miles north of Clinton, Lillooet district, B.C.

92–P–W½ (Anal. F. Baridon) Ser. No. *1920–7*

Fairly coherent white to cream-white material made up of extremely fine particles showing glistening faces with a beautiful silky lustre in reflected light. Scattered through it are a few black particles of small size responsible for a fairly large silica percentage. The material is fairly dense, becoming granulated with more impurities. It forms a surface layer 36 inches deep under which is a granulated cream-coloured bed and under this a dirty white layer of cemented earth. This succession in places is repeated, so that a white layer underlies a yellowish layer.

L. Reinecke (1920, p. 29)

902. HYDROMAGNESITE. Samples taken from a pit in the southwestern part of the main body of a group of deposits about ½ mile from Atlin wharf, Atlin map-area, B.C.

104–N–W½ (Anal. N.L. Turner) Ser. No. *1915–2*

The beds appear to be remarkably uniform in structure and composition, composed of white hydromagnesite, fine grained, powdery without grit, and plastic like clay when wet. At a depth of a foot or so beneath the surface the material has a faint yellow tinge. It shows no sign of bedding or any other structure save a very prominent hackly fracture. In places toward the bottom of the deposits, the material is more strongly coherent and forms a porous rock still preserving its hackly fracture, and traversed by irregular vein-like films of a glassy crystalline substance, which occurs lining minute cavities.

Analyses:

(a) of a sample from a depth of 3 inches;

(b) of a sample from a depth of 1 foot, 1 inch;

(c) of a sample from a depth of 1 foot, 11 inches, or 3 inches above the base.

G.A. Young (1916, p. 53)

	900	901	902 (a)	902 (b)	902 (c)
SiO_2	1.73	4.62	1.86	0.90	0.54
Al_2O_3	0.12	0.16	0.67	0.10	0.17
Fe_2O_3	0.07	0.16	0.15	0.09	0.11
FeO			0.60	0.45	0.64
MgO	43.73	43.17	41.13	42.35	42.19
CaO	0.13	1.14	2.04	0.82	0.68
Na_2O					
K_2O					
H_2O+	17.79[1]	5.26	18.02	18.95	19.05
H_2O-		1.42			
TiO_2					
P_2O_5	0.30				
MnO					
CO_2	37.03	43.64	35.98	36.10	36.17
SO_3		0.51			
Cl	nil	trace			
Total	100.90	100.10 (100.08)	100.45	99.76	99.55
Sp.gr.			1.92	1.61	1.35

[1] With some organic matter

903. HYDROMAGNESITE. From the surface midway along the eastern border of the northwestern deposit lying east of Atlin, Atlin mining district, B.C.

104–N–W½ (Anal. N.L. Turner) Ser. No. *1915–6*

Analyses:

(a) from the northeast corner of the deposit, at a depth of 1½ feet, material partly granular, partly sticky and clay-like with a few hard walnut-sized pieces.

(b) is from the surface midway along the eastern border.

G.A. Young (1916, p. 54)

904. HYDROMAGNESITE. From a layer about 4 inches above the base of the deposit just east of Atlin, Atlin mining district, B.C.

104–N–W½ (Anal. N.L. Turner) Ser. No. *1915–7*

Compacted material traversed with veins of basic hydrous magnesium carbonate.

G.A. Young (1916, p. 55)

905. HYDROMAGNESITE. Representative of the upper white bed, 24 inches deep at the centre of the deposit; lot 178, Riske Creek, 70 miles northwest of Clinton, B.C.

92–O–E½ (Anal. A. Sadler) Ser. No. *1920–9*

Fairly coherent white to cream-white aggregate made up of extremely fine particles showing glistening faces with a beautiful silky lustre in reflected light. Scattered through it may be a few black particles of small size. Material is fairly dense, becoming granulated with more impurities. It forms a surface layer 24 inches deep under which is a granulated cream-coloured bed, and under this a dirty white layer of cemented earth.

	903 (a)[1]	903 (b)[1]	904[1]	905	906
SiO_2	0.96	0.62	1.18	1.85	2.30
Al_2O_3	0.23	0.41	0.33	0.48	0.63
Fe_2O_3	0.12	0.09	0.10	0.20	0.13
FeO	0.53	0.36	0.71	0.16	
MgO	43.04	43.45	42.12	41.74	41.60
CaO	0.16	0.26	0.48	0.17	0.22
H_2O+	19.26	18.95	19.42	12.98	17.53
H_2O-	(9.34)	(1.21)	(21.77)	1.67	1.12
CO_2	36.21	36.23	35.89	40.85	35.88
SO_3				0.11	0.36
Cl				nil	trace
Total	100.51	100.37	100.23	100.21	99.77

[1] Dried at 105°C

The surface is broken into nearly circular humps full of radiating cracks. The deposit forms a thin flat-lying sheet of nearly uniform depth.

L. Reinecke (1920, p. 29)

906. HYDROMAGNESITE. Representative of the upper white bed 24 inches thick; Clinton, B.C.

92–P–W½ (Anal. F. Baridon) Ser. No. *1920–6*

Description same as No. 905.

L. Reinecke (1920, p. 29)

907. HYDROMAGNESITE. Representative of the upper white bed 15 inches thick; at the centre of the main deposit at Meadow Lake, 20 miles northwest of Clinton, B.C.

92–P–W½ (Anal. A. Sadler) Ser. No. *1920–1*

Description same as No. 905.

L. Reinecke (1920, p. 29)

908. HYDROMAGNESITE. Representative of the upper white bed 26 inches deep overlying a granulated cream-coloured bed toward the southeastern end of the deposit; lot 1188, Riske Creek, about 70 miles northwest of Clinton, B.C.

92–O–E½ (Anal. A. Sadler) Ser. No. *1920–10*

Fairly coherent white to cream-white aggregate made up of extremely fine particles showing glistening faces with a beautiful silky lustre. Scattered through it may be a few black particles of small size. Material is fairly dense.

L. Reinecke (1920, p. 29)

909. HYDROMAGNESITE. Representing 26 inches of white earth and part of the underlying layer of cream earth; westerly deposit at Watson Lake, 40 miles north of Clinton, B.C.

92–P–W½ (Anal. ?) Ser. No. *1920–11*

L. Reinecke (1920, p. 31)

910. HYDROMAGNESITE. Samples taken from a pit in the northern part of the main body, towards the middle of a group of deposits about ½ mile from Atlin wharf, Atlin mining district, B.C.

104–N–W½ (Anal. N.L. Turner) Ser. No. *1915–3*

The hydromagnesite is white, fine-grained, powdery, without grit, and plastic like clay when wet. At a depth of a foot or so beneath the surface it has a faint yellow tinge. The material showed no signs of bedding, or any other structure, save a very prominent hackly fracture. In places toward the bottom of the deposit the material is more strongly coherent and forms a porous rock still preserving its hackly fracture, and traversed by irregular vein-like films of a glassy crystalline substance, which lines minute cavities.

Analyses:

(a) of a sample taken at a depth of 4 inches;

(b) of a sample taken at a depth of 16½ inches.

G.A. Young (1916, p. 53)

	907	908	909	910 (a)[1]	910 (b)[1]
SiO_2	4.00	1.22	6.36	1.22	1.96
Al_2O_3	1.36	0.48	0.20	0.67	0.14
Fe_2O_3	0.14	0.25	0.12	0.18	0.45
FeO	0.23	0.09		0.63	0.65
MgO	41.38	41.14	41.06	40.56	41.93
CaO	1.32	0.10	1.62	1.26	1.50
Na_2O					
K_2O	0.14				
H_2O+	12.12	17.78	11.25	19.04	17.66
H_2O-	1.48	1.28	1.32	(1.31)	(2.64)
CO_2	37.67	37.70	38.04	35.96	36.04
SO_3		0.08	0.08		
Cl		nil	trace		
Total	99.84	100.11 (100.12)	100.05	99.52	100.33
Sp.gr.				1.45	1.31

[1] Dried at 105°C

911. **HYDROMAGNESITE.** From the centre of the southeastern deposit, just east of Atlin, Atlin mining district, B.C.

104–N–W½ (Anal. N.L. Turner) Ser. No. *1915–5*

The average thickness is 3 feet. The surface is comparatively irregular and the material wetter than that on the other deposits.

Analyses:

(a) of a sample from a depth of 1 foot 9 inches;

(b) of a sample from a depth of 1 foot 4 inches.

G.A. Young (1916, p. 54)

912. **HYDROMAGNESITE.** From a layer as much as 39 inches deep, taking in the white uppermost layer and the top of the underlying cream layer; near the centre of deposit 3, Meadow Lake, 20 miles northwest of Clinton, B.C.

92–P–W½ (Anal. ?) Ser. No. *1920–4*

L. Reinecke (1920, p. 31)

913. **IMPURE HYDROMAGNESITE**. Underlying white hydromagnesite and forming a bed 15 to 51 inches from the surface; at the centre of deposit 3, Meadow Lake, 20 miles north-northwest of Clinton, B.C.

92–P–W½ (Anal. ?) Ser. No. *1920–2*

Granulated cream-coloured earth overlain by pure white hydromagnesite and underlain by cemented earth. It carries a fairly large percentage of silica and other impurities. The division between the hydromagnesite and granulated earth is marked by an irregular layer of brown sand.

L. Reinecke (1920, p. 31) *See also* Nos. 907, 915 *(1920–1, 5)*

914. **HYDROMAGNESITE**. From a pit in the northern end of the main body toward the middle of the deposit; in the group of deposits situated ½ mile from Atlin wharf, Atlin mining district, B.C.

104–N–W½ (Anal. N.L. Turner) Ser. No. *1915–4*

Yellowish material of a comparatively coarsely granular texture appears under 21 inches of white hydromagnesite. This coloration is possibly of organic origin and seems to disappear on exposing the mineral to the air. The sample was taken from a depth 7 inches below its upper limit.

G.A. Young (1916, p. 53)

	911 (a)[1]	911 (b)[1]	912	913	914[1]
SiO_2	0.74	3.48	13.10	11.33	9.22
Al_2O_3	0.35	2.85	1.34	2.88	0.94
Fe_2O_3	0.15	0.56	0.11	0.24	0.73
FeO	0.66	0.81	0.17	0.20	0.78
MgO	42.85	38.94	36.63	35.68	35.23
CaO	0.32	0.42	2.86	6.38	6.44
Na_2O					
K_2O				0.14	
H_2O+	19.10	18.10	7.00	4.15	8.20
H_2O-	(1.21)	(1.18)	2.58	2.29	(2.64)
TiO_2					
P_2O_5					
MnO					
CO_2	36.35	34.31	35.64	36.63	37.70
SO_3			0.13	nil	
Cl			trace	nil	
Total	100.52	99.47	99.56	99.92	99.24
Sp.gr.					2.64

[1] Dried at 105°C

915. IMPURE HYDROMAGNESITE. 39 to 60 inches from the surface below the hydromagnesite; near the centre of deposit 3, Meadow Lake, 20 miles northwest of Clinton, B.C.

92–P–W½ (Anal. ?) Ser. No. *1920–5*

Grey to cream-yellow, with a granulated texture. Often shows well-defined thin beds lying flat but with a slightly wavy outline. Between the bands are flattened cavities with rounded and curved surfaces. It is made up almost wholly of rounded carbonate grains 0.002 to 0.005 mm in diameter that are undoubtedly anhydrous carbonates, possibly dolomite. There are also fine, needle-shaped crystals of high birefringence, probably brucite, and a cloudy looking, very finely divided substance, the nature of which was not determined, but part of which may be amorphous silica.

L. Reinecke (1920, p. 31)

916. IMPURE MAGNESITE. From a depth of 0 to 24 inches at the northeast end of Meadow Lake, about 20 miles north-northwest of Clinton, B.C.

92–P–W½ (Anal. ?) Ser. No. *1920–12*

Typical of the composition of minute patches of grey-white earth lying near the deposits of clean hydromagnesite at Meadow Lake, Clinton, and elsewhere. It is very high in siliceous impurities and also in lime. The basic deposit is at 27 inches.

L. Reinecke (1920, p. 31)

	915	916	917	918[1]	919[1]
SiO_2	10.32	36.78			
Al_2O_3	1.35	1.54			
Fe_2O_3	0.49	0.84			
FeO		0.59			
MgO	24.32	20.14			
CaO	20.12	9.20	20.42	trace	0.11
H_2O+	2.93	6.80	9.46		
H_2O-	1.45	3.52	32.46	(0.06)	(0.05)
CO_2	38.64	20.24			
SO_3	0.14	0.07	0.55	42.09	
Cl	trace	trace			
SrO				48.30	56.31
BaO				9.44	trace
B_2O_3			37.44		
H_2SO_4					43.51
Total	99.76	99.72	100.33	99.83	99.93
Sp.gr.				3.994	3.958

[1] Dried at 105°C

917. **INYOITE.** Whitehead gypsum quarry, Hillsborough, N.B.

21–H–E½ (Anal. H.V. Ellsworth) Ser. No. *1921–5*

Occurs with selenite crystals, sometimes superimposed on them, developed on a piece of greyish white, fairly compact gypsum. The inyoite forms white translucent crystals, which are remarkably well developed and clear and with rare exceptions are doubly terminated. The birefringence is strong and negative. Dispersion is weak.

E. Poitevin and H.V. Ellsworth (1921, p. 18)

918. **CELESTITE.** Forming a vein traversing Laurentian strata; lot 7, con. 10, Bagot tp., Renfrew co., Ont.

31–F–E½ (Anal. R.A.A. Johnston) Ser. No. *1898–1*

Milk-white, pearly, translucent, radiating columnar, massive celestite.

G.C. Hoffmann (1900, p. 9)

919. **CELESTITE.** Found in a well-defined vein traversing crystalline limestone; lot 2, con. 8, Lansdowne tp., Leeds co., Ont.

31–C–E½ (Anal. R.A.A. Johnston) Ser. No. *1894–3*

The celestite was in some places nearly pure, at other places was associated with calcite, constituting a gangue through which galena is irregularly distributed in crystals and small masses. The celestite examined was a rather large, tabular, crystalline mass. It is semi-transparent, bluish or fairly pale reddish, but at times colourless. Usually it has a faint yellowish brown tinge.

G.C. Hoffmann (1896, p. 10)

920. **MIRABILITE.** Occurs on cliffs of shale; Fort St. John, Peace River, B.C.

94–A–E½ (Anal. G.C. Hoffmann) Ser. No. *1875–8*

A friable white opaque mineral with a saline, bitter taste. It is very soluble in water. The sample consisted of an effervescent granular aggregate with intermingled fragments of a dark grey shale.

G.C. Hoffmann (1877, p. 421)

921. **GYPSUM AND ANHYDRITE.** On the steep hillsides near the main masses of hydromagnesite just above the wagon road north at ¼ mile from the west end of Kelly Lake, Clinton area, B.C.

92–P–W½ (Anal. ?) Ser. No. *1920–13*

Nodular gypsum.

L. Reinecke (1920, p. 32)

922. HEXAHYDRITE. Seams and scattered patches in altered rock; east coast of the Bonaparte River, about halfway between Cargill and Scottie Creeks, Lillooet mining district, B.C.

92–P–E½ (Anal. R.A.A. Johnston) Ser. No. *1910–4*

Some of the seams are nearly ½ inch thick and generally have a moderately coarse columnar structure, but occasionally a delicately fibrous form. No distinct crystals were seen, and the cleavage is not well

	920 insol.	921	922	923	924 (a) insol.	924 (b) insol.
SiO_2	8.61	3.75				
Al_2O_3	3.45	0.67		13.48		
Fe_2O_3		0.41		2.89		
FeO	1.32			0.16		
MgO	0.24	0.48	17.15	0.14		
CaO	0.68	31.48		0.14		
Na_2O				0.13		
K_2O				0.09		
H_2O+		2.18	) 46.42	) 45.11		
H_2O-		18.00				
MnO	trace					
CO_2		2.22				
SO_3		41.09	34.52			
NH_3				trace		
H_2SO_4	0.83			36.94		
organic matter	1.20					
insoluble			1.78	0.24		
Total	16.33	100.28	99.87	99.32	21.25	18.35
	sol.				sol.	sol.
$Al_2(SO_4)_3$	0.53					
$Al_2(SO_4)_3 .18 H_2O$					59.55	53.63
$FeSO_4$	0.65					
$MgSO_4$	26.69					
$MgSO_4 .7 H_2O$					18.73	26.87
$MgCl_2$	0.42					
$CaSO_4$	2.28					
$NaSO_4$	51.35					
K_2SO_4	0.25					
H_2O	17.33					
$MnSO_4$	0.50					
Total	100.00				99.53	98.85
Sp.gr.			1.757			

defined. Readily friable hexahydrite, breaking with a fine sub-conchoidal fracture. It is white with a pearly lustre, and a bitter, saline taste.

R.A.A. Johnston (1911, p. 256)

923. **ALUNOGEN.** From an old heap of shale; Scotia Mine, Springhill coal field, Cumberland co., N.S.

21–H–E½ (Anal. F.D. Adams) Ser. No. *1878–1*

Occurs in the form of a crust 5 to 6½ cm thick. It is white, in some places light yellow, with an inky astringent taste, and is soluble in water. It melts in its water of crystallization and at a higher temperature gives off sulphuric acid.

G.C. Hoffmann (1880, p. 8)

924. **ALUNOGEN.** From a vein 9 inches wide; near Vernon, B.C.

92–I–W½ (Anal. F.T. Shutt) Ser. No. *1927–13*

The material is not uniform in mineral composition. Quartz, epsomite, and other minerals are readily seen. The alunogen occurs as minute acicular or capillary, pinkish white crystals, forming intricate masses or filling druses. The indices of refraction of minute crystals are: $\alpha = 1.463 \pm 0.003$; $\beta = 1.475 \pm 0.003$; $\gamma = 1.483 \pm 0.003$.

Two analyses, (a) and (b), were made.

E. Poitevin (1926, pp. 16, 17)

925. **LINARITE.** Occurs along the walls of cavities in an orebody consisting of galena and chalcopyrite; at the Beaver Group, Beaver Mountain, Slocan, West Kootenay District, B.C.

82–K–W½ (Anal. R.A.A. Johnston) Ser. No. *1910–5*

Occurs, along with anglesite, in individual crystals (some nearly ½ inch long) and in crystal groups. Vitreous lustre, deep azure-blue, some thin tabular forms are sub-transparent.

R.A.A. Johnston (1911, p. 260)

926. **JAROSITE (?).** Coats some of the fragments in the body of hydrous silica and also forms narrow veinlets or seams crossing the white silica; at the Minaki deposit of hydrous silica, Rainy River district, B.C.

52–E–E½ (Anal. R.J.C. Fabry) Ser. No. *1934–9*

Yellowish to orange-coloured powder, which extends apparently only a few feet below the glacial drift.

(J.F. Wright and C.H. Stockwell)

927. **LITHIOPHILITE.** From the lithium-rich middle zone of a pegmatite dyke cutting volcanic rocks; on Bear Mineral Claim, lot 17, rge. 16, tp. 16, 10 miles northeast of Point du Bois, Man.

52–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1927–9*

Occurs as compact cleavable masses varying in colour from salmon to orange, and as a rule is very fresh but some surrounding feldspars show dark stains of manganese oxide derived from alteration of the lithiophilite. It is optically positive. Indices of refraction: α = 1.665 ± 0.001; β = 1.670 ± 0.001; γ = 1.680 ± 0.001; birefringence ($\gamma - \alpha$) = 0.0148 ± 0.001.

H.V. Ellsworth (1932, pp. 156, 264)

928. **COLLINSITE.** Vein 4 inches to 12 inches wide between basaltic lava flows; 1,000 feet from a farm-house, 2 miles northwest from the ferry landing on the north side of François Lake, B.C.

93–L–W½ (Anal. E.A. Thompson) Ser. No. *1927–12*

	925	926	927	928	929
SiO_2				0.10	
Al_2O_3				0.39	33.14
Fe_2O_3		48.09		0.80	
FeO			0.24	6.86	
MgO			0.04	6.34	
CaO			1.03	32.18	
Na_2O		3.61	0.50		2.96
K_2O		11.82	trace		0.26
H_2O+	) 4.73	3.35[1]	) 1.39	12.28	) 5.12
H_2O-				0.15	
TiO_2					
P_2O_5			44.47	39.83	48.63
MnO			45.18		
CO_2				0.23	
SO_3		33.13			
F				0.27	2.15
Li_2O			6.99		8.20
Mn_2O_3				0.36	
Cu_2O_3	19.88				
$PbSO_4$	75.17				
organic matter				0.18	
Total	99.78	100.00	99.84	99.97	100.46
Less O≡ F				0.11	0.91
				99.86	99.55
Sp.gr.	5.23			2.95	

[1] By difference

The vein material consists of botryoidal phosphate associated with some asphalt and brecciated andesite. The phosphorite is an association of collinsite and quercyite arranged in layers about andesite fragments. The collinsite layers consist of medium brown masses of elongated blades without crystallographic forms but having their axis approximately perpendicular to the surfaces of the layers. The blades vary in size from 1 cm long by ½ mm wide to those of microscopic dimensions and are not grouped with any particular optical orientation. The blades are light brown and somewhat translucent with a silky lustre. The indices of refraction are: α = 1.632 ± 0.003; β = 1.642 ± 0.003; γ = 1.657 ± 0.003; $(\gamma - \alpha) = 0.015$. Elongation positive. Optically positive, 2V = 80°, triclinic.

E. Poitevin (1926, p. 8)

929. AMBLYGONITE (VARIETY MONTEBRASITE). From the lithium-rich middle zone of a pegmatitic dyke cutting volcanic rocks; Bear Mineral Claim, lot 17, rge. 16, tp. 16, 10 miles northeast of Point du Bois, Man.

52–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1927–2*

Occurs in greyish white masses with polysynthetic twinning and was at first mistaken for feldspar. Indices of refraction are:
α = 1.600; β = 1.611; γ = 1.620.

H.V. Ellsworth (1932, pp. 159, 255)

930. APATITE. Ritchie Mine, lot 7, rge. 7, Portland tp., Papineau co., Que.

31–G–W½ (Anal. G. Hoffmann) Ser. No. *1877–6*

Taken from an exposed mass nearly 20 feet across where the only apparent foreign mineral admixture was a few crystals of pyroxene and mica. It is massive, lamellar, with the lamellae varying in thickness from 1 to 8 mm and frequently coated with a film of calcite. It is brittle with uneven angular fracture across the lamellae. The lustre of the fracture is vitreous and on clean surfaces resinous. It is bright sea-green, semi-transparent, and in thin sections transparent.

G.C. Hoffmann (1879, p. 5)

931. APATITE. Grant Mine, lot 18, rge. 12, Buckingham tp., Papineau co., Que.

31–G–W½ (Anal. G.C. Hoffmann) Ser. No. *1877–4*

Massive, vitreous, brittle, pale greenish grey apatite with angular to subconchoidal fracture; thin splinters are translucent. It is not unfrequently penetrated by thin seams of calcite and resembles 'porcelain jasper' in its aspect.

G.C. Hoffmann (1879, p. 3)

932. **APATITE.** Lot 10, rge. 10, Loughborough tp., Frontenac co., Ont.

31–C–E½ (Anal. G.C. Hoffmann) Ser. No. *1877–7*

Massive, compact, brittle, dull red apatite, with uneven angular fracture and dull to subresinous lustre. It is interpenetrated by delicate films of specular iron.

G.C. Hoffmann (1879, p. 6)

933. **APATITE.** Doctor Pit, lot 12, rge. 12, Templeton tp., Papineau co., Que.

31–G–W½ (Anal. G.C. Hoffmann) Ser. No. *1877–10*

Massive, compact, translucent, pale greenish white apatite with uneven fracture and feeble waxy lustre.

G.C. Hoffmann (1879, p. 9)

934. **APATITE.** Watts Mine, lot 6, rge. 1, Portland tp., Papineau co., Que.

31–G–W½ (Anal. G.C. Hoffmann) Ser. No. *1877–8*

Massive, crystalline, granular, friable, greenish white apatite with glimmering lustre. The texture of this variety varies from a very fine granular, crystalline, greenish to greyish white, homogeneous, somewhat easily friable rock closely resembling a disintegrating sandstone to a crystalline, granular, sea-green rock with embedded rounded fragments of semi-transparent sea-green apatite perhaps constituting a conglomerate.

G.C. Hoffmann (1879, p. 7)

	930	931	932	933	934
SiO_2					
Al_2O_3	0.57	0.71	0.84	0.57	0.27
Fe_2O_3	0.09	0.13	0.91	0.13	0.08
FeO					
MgO	0.18	0.16	0.16	0.62	0.21
CaO	49.34	49.16	48.48	49.10	49.04
F	3.86	3.47	3.73	3.55	3.38
Cl	0.23	0.26	0.43	0.04	0.09
Ca	4.20	3.80	4.17	3.76	3.60
H_2CO_3	0.22	0.37	0.11	0.52	0.86
H_3PO_4	41.14	41.08	40.87	40.81	40.52
insoluble	0.06	0.37	1.15	0.63	1.63
Total	99.89	99.51	100.85	99.73	99.68
Sp.gr.	3.1884	3.1493	3.1641	3.1750	3.1676

935. **APATITE.** Lot 14, rge. 6, Storington tp., Frontenac co., Ont.

31–C–E½ (Anal. G.C. Hoffmann) Ser. No. *1877–3*

Massive, compact, greyish to reddish white apatite with reddish brown stripes or bands that impart to the rock a stratified appearance. The lustre is dull and fracture is uneven.

G.C. Hoffmann (1879, p. 2)

936. **APATITE.** Lot 16, rge. 3, North Burgess tp., Lanark co., Ont.

31–C–E½ (Anal. G.C. Hoffmann) Ser. No. *1877–5*

Massive, confusedly crystalline apatite, with a weakly defined schistose texture. It is dull red with uneven fracture and sub-vitreous to dull lustre.

G.C. Hoffmann (1879, p. 4)

937. **APATITE.** Grant Mine, south half of lot 18, rge. 12, Buckingham tp., Papineau co., Que.

31–G–W½ (Anal. G.C. Hoffmann) Ser. No. *1877–9*

Massive, crystalline, fine granular apatite, with occasional embedded rounded fragments of semi-transparent sea-green apatite. Greyish green with a glistening lustre due to the presence of intermixed grains of pyrrhotite. The fracture is unevenly granular.

G.C. Hoffmann (1879, p. 8)

938. **QUERCYITE.** A vein 4 inches to 12 inches wide between basaltic lava flows; 1,000 feet from a farm-house 2 miles northwest from the ferry landing on the north side of François Lake, B.C.

93–L–W½ (Anal. E.A. Thompson) Ser. No. *1927–14*

The vein consists of botryoidal phosphate associated with some asphalt and breciated andesite. The phosphorite is an association of collinsite and quercyite arranged in layers about andesite fragments. The quercyite layers are of variable width and where narrowest have a somewhat wavy structure in addition to the general botryoidal curvature. They are dark brown and cryptocrystalline. The indices of refraction: $\alpha = 1.613 \pm 0.002$; $\beta = 1.626 \pm 0.002$; $\gamma = 1.629 \pm 0.002$. Distinctly biaxial with $2V = 5°$ to $10°$.

E. Poitevin (1926, p. 10)

939. **LAZULITE.** Veins traversing greyish white subtranslucent quartz; ¾-mile east of the mouth of Churchill River, Man.

54–K–W½ (Anal. G.C. Hoffmann) Ser. No. *1878–12*

Massive, fine deep azure-blue subtranslucent material with a vitreous lustre and uneven brittle fracture.

G.C. Hoffmann (1880, p. 2)

	935	936	937	938	939
SiO_2				0.19	
Al_2O_3	0.61	1.19	1.98	0.60	29.14
Fe_2O_3	0.15	1.29	0.12	0.12	
FeO				1.90	2.09
MgO	0.15	0.55	0.42	0.62	13.84
CaO	47.83	46.33	44.20	50.22	2.83
H_2O				4.20	6.47
P_2O_5				34.96	
Mn_2O_3				0.12	
CO_2				5.45	
S			3.51		
F	3.31	3.79	2.86	1.83	
Cl	0.44	0.48	0.10		
Ca	3.73	4.26	3.06		
Fe			5.37		
H_2CO_3	0.03	0.10	2.85		
H_3PO_4	40.37	39.05	34.03		46.39
organic				0.82	
insoluble	3.89	3.49	2.05		
Total	100.51	100.53	100.55	101.03	100.76
Less O≡ F				0.77	
				100.26	
Sp.gr.	3.1393	3.1603	3.2441	3.04	3.0445

940. CARNOTITE. Occurs in small fissures in the rocks of a copper deposit; in the vicinity of Gowland Harbour, Quadra Island, B.C.

92–K–W½ (Anal. Dr. Archibald) Ser. No. *1932–44*

Soft, greenish yellow.

H.V. Ellsworth (1932, p. 139)

941. HUBNERITE. Irregularly distributed in a lenticular quartz vein cutting gneissic or granitic rock; Emerald, on Tom Murphy's Brook about 9 miles by road from Margaree Forks, Inverness co., N.S.

11–K–E½ (Anal. R.A.A. Johnston) Ser. No. *1898–3*

Associated with small quantities of chalcopyrite and a very little pale yellow, hydrous mica, irregularly distributed in light greyish white translucent quartz. The hubnerite occurs as narrow seams and small irregular masses in the quartz. It is brownish black with a sub-metallic lustre and breaks with a small subconchoidal fracture.

G.C. Hoffmann (1900, p. 10)

942. **WOLFRAM.** In a boulder of Laurentian gneiss; Lake Couchiching, Ont.
31–D–W½ (Anal. T.S. Hunt) Ser. No. *1863–47*

Occurs with magnetic iron ore.

Geological Survey (1863, p. 503)

943. **SCHEELITE.** Lot 1, rge. 7, Marlowe tp., Beauce co., Que.

21–L–E½ (Anal. R.A.A. Johnston) Ser. No. *1890–40*

Occurs in pale wine-yellow crystals, together with some specular iron, pyrrhotite, and pyrite, in a white subtranslucent quartz.

G.C. Hoffmann (1892, p. 21)

944. **SCHEELITE.** In a quartz lead intersecting the main auriferous vein; at the Ballou or Old American Mine, Malaga Gold Mining district, Queen's co., N.S.

21–A–E½ (Anal. R.A.A. Johnston) Ser. No. *1895–49*

A light, smoke grey, subtranslucent, massive mineral with vitreous lustre.

G.C. Hoffmann (1897, p. 9)

	940	941	942	943	944[1]
SiO_2	17.54	1.33	0.20	0.29	
Fe_2O_3	) 22.0			0.70	
FeO		0.47	9.05		
MgO		0.86			
CaO	4.5	0.02		19.37	19.80
Na_2O	2.2				
K_2O	3.2				
H_2O+	) 5.0				
H_2O-					
MnO		22.73	15.35		
CO_2					0.71
V_2O_5	19.00				
MoO_3		trace			
WO_3		74.28	73.45[2]	79.90[2]	79.01
U oxide	27.70				
columbic acid			1.95		
insoluble					0.11
Total	101.14	99.69	100.00	100.26	99.63
Sp.gr.		6.975	6.938	6.059	6.002

[1] Mean of two analyses
[2] Listed in these two analyses as "tungstic acid"

945. **OLIVINE.** Ste. Anne's, Jacques Cartier co., Que.

31–H–W½ (Anal. B.J. Harrington) Ser. No. *1877–18*

Angular masses of olivine occasionally more than an inch in diameter occur in a rather fine-grained groundmass, which also contains large plates of mica, sometimes an inch or more across, and irregular masses or occasionally bright crystals of augite. The olivine colours the rock a bright red. It has the usual fissured or cracked appearance. Along some of the cracks an alteration to serpentine has taken place, whereas along others a little red oxide of iron is visible and gives the olivine its red colour.

B.J. Harrington (1879, p. 39)

946. **OLIVINE.** Occurs in a granite dolorite; Montarville, Chambly co., Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1858–19*

Olivine is the predominant mineral and occurs in olive- or amber-coloured imperfect crystals sometimes ½ inch in diameter, forming 45.0% of the rock. It is serpentinized along cracks and partings.
Analyses:
(a) of one part of the olivine;
(b) of another part of the olivine.

T.S. Hunt (1859, p. 183)

947. **KNEBELITE.** From the south side of Nahwitti Lake, North Vancouver Island, B.C.

92–L–W½ (Anal. R.J.C. Fabry) Ser. No. 1937–5

(M. Hepler)

948. **ALMANDITE.** Among the heavier materials carried down in the sluice boxes, Hoole Canyon, Pelly River, Yukon Territory.

105–G–W½ (Anal. R.A.A. Johnston) Ser. No. *1910–1*

	945	946 (a)	946 (b)	947	948
SiO_2	38.56	37.13	37.17	30.97	37.7
Al_2O_3					21.1
Fe_2O_3	1.36			19.39	2.4
FeO	12.65	22.57	39.68	29.65	31.9
MgO	44.37	39.36	22.54	0.33	5.1
CaO				14.27	nil
H_2O	2.91[1]			1.81	
MnO	0.11			3.59	1.5
Total	99.96	99.06	99.39	100.01	99.7
Sp.gr.					3.991

[1] By ignition

Occurs in the form of minute angular grains frequently found on the edges. They have a pale reddish colour and vitreous lustre. It is associated with awaruite and magnetite.

R.A.A. Johnston (1911, p. 259)

949. GARNET. In the vicinity of Grenville, Rivière Rouge, Argenteuil co., Que.

31–G–E½ (Anal. T.S. Hunt) Ser. No. *1858–14*

Disseminated through a peculiar gneissoid feldspathic rock in small rounded masses from 1/10 to ½ inch in diameter. It is much fissured, very fragile, and fragments were transparent and red-rose, inclining to brownish.

T.S. Hunt (1859, p. 193)

950. SPESSARTITE. From pegmatite dykes, genetically related to, and cutting in all directions, a muscovite granite; south of Lake Lortie, Lacorne tp., Abitibi, co. Que.

32–C–W½ (Anal. H.V. Ellsworth) Ser. No. *1950–15*

Occurs commonly in minute, bright yellow to orange-yellow grains, uniformly distributed throughout a spodumene-bearing pegmatite.

L.P. Tremblay (1950, p. 47)

951. UVAROVITE. Lot 6, rge. 12, Orford tp., Sherbrooke co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1863–15*

Transparent emerald-green garnet forms granular masses in a white crystalline calcite.

Geological Survey (1863, p. 497)

	949	950	951	952	953
SiO_2	37.80	38.2	36.65	39.49	38.60
Al_2O_3	21.00	20.8	17.50	22.35	22.71
Fe_2O_3		) 2.2			) 1.60[1]
FeO	29.03		4.97	1.00	
MgO	8.85	0.4	0.81	0.28	0.49
CaO	1.81	0.4	33.20	36.62	34.83
Na_2O & K_2O					0.47
MnO		38.0		0.15	
Cr_2O_3			6.20		
volatile	0.18		0.30		
loss on ignition					1.10
Total	98.67	100.00	99.63	99.89	99.80
Sp.gr.		4.279		3.60	

[1] Including Mn

952. GROSSULARITE. Southwark Pit, lot B, rge. 28, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. R.P.D. Graham) Ser. No. *1918–18*

Forms granular, somewhat cavernous, crystalline masses composed almost entirely of grossularite with a little reddish brown vesuvianite in prismatic crystals, and minute six-sided flakes of clinochlore. It is colourless and transparent. Within the cavities fine crystals occur plentifully, some of which attain a diameter of ½ cm. They are always dodecahedral. Refractive index = 1.734.

E. Poitevin and R.P.D. Graham (1918, p. 47)

953. GARNET. Lot 16, rge. 16, Orford tp., Sherbrooke co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1856–11*

Amorphous, finely granular, extremely tenacious garnet, with a conchoidal fracture and a feeble waxy lustre. It is yellowish-greenish white, and subtranslucent. It occurs in a rock in contact with an ophiolite and consists of white garnet intermingled with a small amount of soft green serpentine, which fills the interstices between irregular rounded masses of the garnet.

T.S. Hunt (1857c, p. 449)

954. GROSSULARITE. Lot 12, rge. 1, Litchfield tp., Pontiac co., Que.

31–F–E½ (Anal. F.G. Wait) Ser. No. *1892–12*

A massive garnet, honey-yellow with a vitreous lustre.

G.C. Hoffmann (1895, p. 16)

955. GROSSULARITE. Whitehorse Copper Belt, on the west side of the Lewes River opposite Whitehorse and Miles Canyon, Yukon Territory.

105–E–W½ (Anal. R.A.A. Johnston) Ser. No. *1899–8*

Faintly yellowish, light grey, wood-brown, occasionally brownish grey, compact masses of grossularite. More rarely as yellowish brown and reddish brown, imperfectly crystalline, grossularite.

G.C. Hoffmann (1901, p. 14)

956. ANDRADITE. Cawood tp., Pontiac co., Que.

31–F–E½ (Anal. F.G. Wait) Ser. No. *1892–2*

A massive brittle garnet with brilliant lustre. It is black by reflected light and dark purplish red in thin splinters.

G.C. Hoffmann (1895, p. 16)

957. **ANDRADITE.** Near Foster's Bar about 23 miles above Lytton, Fraser River, Yale District, B.C.

92–I–W½ (Anal. F.G. Wait) Ser. No. *1892–3*

A massive, very finely granular, clove-brown garnet with dull resinous lustre.

G.C. Hoffmann (1895, p. 16)

958. **SCHORLOMITE.** From the nepheline syenite of the Ice River complex, Ice River, B.C.

82–N–E½ (Anal. F.G. Wait) Ser. No. *1899–27*

A massive garnet without cleavage. Velvet-black, with here and there a tarnished blue. It has a vitreous lustre with irregular, occasionally subconchoidal fracture. It occurs in masses of considerable size as an accessory constituent.

G.C. Hoffmann (1901, p. 12)

	954	955	956	957	958
SiO_2	36.80	38.94	36.09	34.52	25.77
Al_2O_3	20.53	15.11	12.69	4.09	3.21
Fe_2O_3	2.38	6.30	12.33	25.82	9.69
FeO	0.56		3.30	2.66	8.01
MgO	1.51	1.62	0.94	0.59	1.22
CaO	37.41	36.93	34.46	31.49	31.76
H_2O	0.07		0.04	0.03	
TiO_2					19.95
MnO	0.50	0.78	0.48	0.94	0.76
loss on ignition		0.35			
Total	99.76	100.03	100.33	100.14	100.37
Sp.gr.	3.623	3.603	3.690	3.706	3.802

959. **ZIRCON.** Grenville, Argenteuil co., Que.

31–G–E½ (Anal. T.S. Hunt) Ser. No. *1850–9*

Brownish red, passing into flesh-red and cherry-red, subtranslucent to transparent zircon, associated with tabular barite, calcite, sphene, pyroxene, and plumbago. It forms crystals often ½ inch in diameter and an inch or more long, with finely modified terminations.

T.S. Hunt (1852a, p. 43)

960. CYANITE (KYANITE). North Thompson River, B.C.

92–P–E½ (Anal. G.C. Hoffmann) Ser. No. *1878–4*

The mineral is embedded in a granular quartz, which in addition contains a few scales of silvery white mica. It occurs for the most part as radiated columnar aggregates, which are in parts pure blue passing into greenish grey, and other parts a uniform light bluish grey It is transparent with vitreous lustre.

G.C. Hoffmann (1880, p. 1)

961. TOPAZ. In the lithium-rich middle zone of the pegmatite dyke cutting volcanic rocks; Bear Mineral Claim, lot 17, rge. 16, tp. 16, 10 miles northeast of Point du Bois, Man.

52–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1930–4*

Crude long pyramidal crystals and crystalline masses of topaz as much as 3 inches or more in diameter, and a foot or more long, have been found, but the mineral is localized and not really abundant. It is whitish or faintly blue-green, and shows well-developed basal cleavages.

H.V. Ellsworth (1932, pp. 157, 267)

	959	960	961	962	963
SiO_2	33.7	36.29	32.13	36.94	32.09
Al_2O_3		62.25	58.16	0.12	
Fe_2O_3		0.55	trace	0.02	
FeO					1.16
MgO		0.36	0.37	0.05	
CaO		1.06	nil	34.90	28.50
Na_2O			0.24		
K_2O			trace		
H_2O+			) 0.24	) 5.68	
H_2O-					
TiO_2 (Ti acid?)					37.06
P_2O_5					
MnO					
CO_2					
F			16.51		
ZrO_2	67.3				
B_2O_3				22.37	
loss on ignition					0.66
Total	101.0	100.51	107.65	100.08	99.47
Less O≡ F			6.95		
			100.70		
Sp.gr.	4.602–2.625	3.6005		2.985	

962. DATOLITE. In the workings of the Daisy Mica Mine, lot 9, rge. 1, Derry tp., Papineau co., Que.

31–G–W½ (Anal. R.A.A. Johnston) Ser. No. *1899–2*

A greenish white to almost opaque mineral with a dull lustre, breaking with an uneven to sub-conchoidal fracture. It occurs in the form of hard, compact, irregularly shaped masses of variable size and occasionally as moist plastic masses embedded in a matrix of pyroxene, phlogopite, calcite, quartz, and fluorite, with some pyrite, pyrrhotite, barite, and faujasite.

G.C. Hoffmann (1901, p. 18)

963. SPHENE. Grenville, Argenteuil co., Que.

31–G–E½ (Anal. B.J. Harrington) Ser. No. *1877–15*

Occurs as crystals of various shades of brown. They vary in size from merely microscopic to several inches across and are commonly sub-translucent. They are usually brittle and difficult to obtain in perfect condition.

B.J. Harrington (1879, p. 23)

964. SPHENE. Grenville, Argenteuil co., Que.

31–G–E½ (Anal. T.S. Hunt) Ser. No. *1851–11*

Occurs in a vein of plumbago associated with white tabular feldspar, green pyroxene, yellow idocrase, and, more rarely, zircon and cinnamon stone garnet. In one place it forms masses often several feet in diameter; at other places it forms drusy-surfaced crystals often of considerable size. It is light clove-brown and translucent.

T.S. Hunt (1852b, p. 119)

965. ILVAITE. In a vein about 20 feet wide; near the head of Barclay Sound, Vancouver Island, B.C.

92–F–E½ (Anal. G.C. Hoffmann) Ser. No. *1890–7*

Occurs in large irregular masses containing only small quantities of white translucent cleavable calcite. The structure is more or less closely compacted crystalline. It is iron black, submetallic, and brittle, with an uneven fracture.

G.C. Hoffmann (1892, p. 11)

966. ALLANITE. On the face of a cliff of granite intrusive into adjoining hornblende gneiss; 200 yards east of the end of the portage leading to Lake Normand, Lacabaude, Normande tp., Champlain co., Que.

31–P–W½ (Anal. H.V. Ellsworth) Ser. No. *1932–57*

Tabular crystals of allanite of a maximum size of 6 inches by 4 inches by 1¼ inches are scattered through the granite of the cliff face. The larger crystals are centres of prominent radiating fractures and occur singly. The smaller crystals occur in clusters or bunches. When bruised they are dead black or grey.

H.V. Ellsworth (1932, p. 158)

967. **VESUVIANITE.** Southwark Asbestos Pit, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1929–10*

(Unpublished data from Laboratory Files)

968. **VESUVIANITE.** Dominion Chrome Mine, Montreal pit, lot 26, rge. 2, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. R.P.D. Graham) Ser. No. *1913–10*

	964	965	966	967	968
SiO_2	31.83	29.81	29.90	36.69	36.77
Al_2O_3		0.16	13.68	18.95	20.05
Fe_2O_3		18.89	4.64	1.76	nil
FeO		32.50	12.45	1.89	0.65
MgO		0.30	1.20	2.97	2.69
CaO	28.31	13.82	9.46	36.61	37.47
Na_2O			0.07	0.17	2.88
K_2O			0.03	0.12	0.21
H_2O+		1.62	0.59	0.37	
H_2O-			0.13		
TiO_2	40.00		1.91	0.25	
P_2O_5			0.04		
MnO		2.22	1.18	0.36	0.20
CO_2					
F				1.25	
Fe	trace				
$(Ce,La,Di)_2O_3$			21.15		
$(Yt,Er)_2O_3$			1.58		
ThO_2			0.41		
loss on ignition	0.40				
insoluble			1.26		
Total	100.54	99.32	99.68	100.39 (101.39)	100.92
Less O≡ F				0.53	
				99.86 (100.86)	
Sp.gr.	3.490–3.499	3.859			3.32

Occurs in shutes, veins, and irregular vugs as small, well-formed, translucent crystals up to 1.0 mm long, found in places lining the interior walls of drusy cavities. It is uniaxial and optically negative.

J.A. Dresser (1913, p. 81)

969. VESUVIANITE. Montreal Chrome Pit, lot 2, rge. 25, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. R.P.D. Graham) Ser. No. *1918–19*

Forms compact fine-grained crystalline masses having a deep lilac tint, which fades somewhat after exposure to air and light. It has the usual high index and low birefringence. Faint pleochroism is visible in thick sections. A fine even grained granitic texture, in which the rock is composed entirely of fairly stout interlocking prisms of vesuvianite, fades into a texture in which individuals are grouped radially and dovetail into one another at their common point of intersection and give rise to spheres.

E. Poitevin and R.P.D. Graham (1918, p. 60)

970. VESUVIANITE. American Chrome Pit, Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1929–11*

(Unpublished data from Laboratory Files)

971. VESUVIANITE. Montreal Chrome Pit, lot 2, rge. 25, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. M.F. Connor or R.P.D. Graham) Ser. No. *1918–20*

Occurs as pale yellow crystals associated with the diopside, which forms the walls and outer parts of certain dyke-like fissures within serpentine, and also as a network of irregular veins traversing massive chromite. The vesuvianite occurs in crystals resting on crystals of colourless or pale diopside lining cavities in this massive rock. Calcite, aragonite, clinochlore, porcellophite, and andradite are commonly associated.

E. Poitevin and R.P.D. Graham (1918, p. 60)

972. PREHNITE. Lot 16, rge. 12, Templeton tp., Papineau co., Que.

31–G–W½ (Anal. B.J. Harrington) Ser. No. *1877–19*

The mineral is translucent and yellowish white with a greenish tinge in places. It seems to have occurred in a cavity and exhibits surfaces made up of an aggregation of crystals.

B.J. Harrington (1879, p. 34)

973. PREHNITE. Jacobs Asbestos Mine, Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1933–1*

(E. Poitevin)

	969	970	971	972	973
SiO_2	36.88	36.96	36.62	42.82	42.40
Al_2O_3	20.03	18.05	15.96	23.86	25.02
Fe_2O_3	0.85	2.24	4.30	1.42	0.51
FeO		0.97	0.54		
MgO	2.17	2.10	1.25	0.09	0.20
CaO	37.61	36.76	38.66	27.64	27.18
Na_2O		0.19			
K_2O		0.13			
H_2O+	3.06	} 0.39	3.11	} 4.82	} 4.57
H_2O-	0.03		0.07		
TiO_2		0.18			
P_2O_5					
MnO	0.23	0.13	trace	0.10	
CO_2		0.10			
F		2.61			
Total	100.86	100.81	100.51	100.75	99.88
Less O≡ F		1.10			
		99.71			
Sp.gr.	3.32			2.891	

974. PREHNITE. Jacobs Asbestos Mine, Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1932–21*

(E. Poitevin)

975. PREHNITE. King asbestos Mine, Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1933–2*

(E. Poitevin)

976. PREHNITE. Occurs in veins traversing intrusive rocks; Admiralty Inlet, Adams Sound, Baffin Island, District of Franklin.

48–C–E½ (Anal. R.A.A. Johnston) Ser. No. *1913–61*

Fine green prehnite accompanied by quartz and calcite. Minute particles of a dark mineral (axinite) are scattered sparsely through the veins. Imperfectly formed quartz crystals radiate from loci midway between wall and central vein. The calcite and prehnite fill the interspaces in equal amounts. The prehnite forms small patches and reticulations up to ¼ inch wide. It occurs in the form of sheaves and bundles of minute crystals mixed with more or less of the calcite and some quartz. It has an indistinct prismatic cleavage. Birefringence > 0.20; index of refraction > 0.16; parallel extinction; optic axial angle is positive. It is very pale green and perfectly translucent with a weak pearly lustre. The axial

plane is either parallel to B (010) or to A (100). The mineral is biaxial and positive and the cleavage angle is 80°. The indices of refraction are as follows: $\alpha = 1.632$, $\beta = 1.642$, $\gamma = 1.665$.
2V calculated = 67°38'.

R.A.A. Johnston (1913, p. 97)

977. **AXINITE.** Along the contact between monzonite and sedimentary beds; on the western slope of Nickel Plate Mountain in the neighbourhood of Climax Bluff, Osoyoos Mining Division, Yale district, B.C.

92–H–E½ (Anal. R.A.A. Johnston) Ser. No. *1910–3*

Occurs in the form of dark hair-brown crystals and crystalline masses and often appears as segregated masses or individual crystals scattered through the rock in localized areas. The fragments are subtranslucent and have a highly vitreous lustre.

R.A.A. Johnston (1911, p. 259)

978. **BERYL.** Silver Leaf Mining Syndicate, lot 17, rge. 16, tp. 16, Oiseau River map-area, Man.

52–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1928–7*

(C.H. Stockwell)

	974	975	976	977	978
SiO_2	42.88	43.36	44.35	42.18	64.59
Al_2O_3	25.85	24.75	19.44	18.12	22.98
Fe_2O_3	0.57	0.85	6.58	0.98	0.21
FeO				7.20	0.11
MgO	0.20	0.20		1.43	0.23
CaO	30.03	26.86	25.50	19.91	0.41
Na_2O					1.08
K_2O					0.33[1]
H_2O+ / H_2O-	} 1.06	} 4.46	} 4.00	} 0.35	} 0.22
TiO_2					nil
P_2O_5					nil
MnO	nil			3.89	0.02
CO_2					
Li_2O					0.14
BeO					10.06
B_2O_3				5.22	
ZnO				0.09	
Total	100.59	100.48	99.87	99.37	100.38
Sp.gr.			2.924	3.296	

[1] Includes R_2O, Cs_2O

979. BERYL. In the lithium-rich middle zone of a pegmatite dyke cutting volcanic rocks; at Bear Mineral Claim, lot 17, rge. 16, tp. 16, 10 miles northeast of Point du Bois, Man.

52–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1929–1*

Greenish beryl occurs in small crystals with milky-white and colourless beryl, but the mineral is not abundant. The largest individuals were about 6 inches long. Very few crystals were terminated. It is uniaxial and optically negative.

H.V. Ellsworth (1932, pp. 156, 259)

980. CORDIERITE. From a quartz-rich gneiss; Sherridon, west of Walton Lake, Batty Lake map-area, Man.

63–N–E½ (Anal. D.S. Robertson) Ser. No. *1953–12*

Gem quality cordierite. The appearance of cordierite is accompanied by decided coarsening of texture in the rock, by an increase in the amount of quartz, and by the appearance of wormy lenticles of magnetite. Sillimanite is commonly present and is a later product than the cordierite. The plagioclase composition remains normal. Indices of refraction: 2V(+) 87.5° – 88.5°; $\alpha = 1.533$; $\gamma = 1.539$; $\gamma - \alpha = 0.006$.

D.S. Robertson (1953, p. 32)

981. CORDIERITE. From an anthophyllite band; north of Batty Lake map-area, Man.

63–N–E½ (Anal. D.S. Robertson) Ser. No. *1953–13*

	979	980	981	982 (a)	982 (b)
SiO_2	65.83	46.55	46.72	51.35	51.85
Al_2O_3	19.01	33.80	35.39	3.70	3.90
Fe_2O_3	0.49				
FeO		7.92	8.30	20.56	20.20
MgO	0.08	10.85	9.21	22.59	21.91
CaO	0.84		0.60	1.68	1.60
Na_2O	0.43				
K_2O	trace				
H_2O	0.08				
TiO_2	nil				
MnO	nil				
BeO	12.74				
Mn					trace
volatile				0.10	0.20
Total	99.50	99.12	100.20 (100.22)	99.98	99.66
Sp.gr.				3.41	3.41

About 97% pure, with chlorite and quartz impurities. The appearance of cordierite is accompanied by a decided coarsening of texture in the rocks and by an increase in the amount of quartz and by the appearance of wormy lenticles of magnetite. The plagioclase composition remains normal. Indices of refraction: 2V (+) 87°: $\alpha = 1.537$; $\gamma = 1.547$; $\gamma - \alpha = 0.010$.

D.S. Robertson (1953, p. 32)

982. HYPERSTHENE. Associated with andesite and ilmenite in the anorthosite rocks of the Laurentian Series; Chateau Richer, Montmorency co., Que.

21–M–E½ (Anal. T.S. Hunt) Ser. No. *1854–8*

Blackish brown or yellowish brown, in lamellae with vitreous sub-metallic lustre and brittle uneven fracture. It is subtranslucent. Two analyses, (a) and (b), were made.

T.S. Hunt (1857b, p. 378)

983. DIALLAGE. Ham tp., Wolfe co., Que.

21–E–W½ (Anal. T.S. Hunt) Ser. No. *1856–3*

Coarsely cleavable and bronze coloured.

T.S. Hunt (1857c, p. 445)

984. DIALLAGE. Lot 15, rge. 13, Orford tp., Sherbrooke co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1856–4*

Small masses of celandine-green diallage, translucent with a pearly lustre, are embedded in an amorphous soft greenish base. It is exceedingly tough, weathering to a superficial reddish brown. Two analyses (a) and (b) were made.

T.S. Hunt (1857c, p. 444)

985. AUGITE. From diabase; Gowganda Mining Division, Timiskaming district, Ont.

41–P–E½ (Anal. M.F. Connor) Ser. No. *1913–23*

Augite is the chief ferromagnesian mineral of the diabase and is partly uralitized. It is faint reddish brown in transmitted light and shows no crystal outlines except in incomplete crystallized basaltic rock types. By decomposition it changes to a hornblende with strong blue-green pleochroic coloration.

W.H. Collins (1913, p. 70)

986. JADEITE (?). Bell Pit, Thetford Mines, Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1935–15*

Fine-grained, light grey material like chert, occurring over a width of 1 inch to 2 inches along the edge of a feldspathic dyke, some 5 or 6 feet thick, which intrudes serpentine.

(H.C. Cooke)

	983	984 (a)	984 (b)	985	986
SiO_2	50.00	47.20	47.10	48.00	57.82
Al_2O_3		3.40	3.50	4.31	nil
Fe_2O_3				3.06	1.33
FeO	13.59	8.91	8.55	17.34	4.09
MgO	27.17	24.53	24.58	9.82	21.60
CaO	3.80	11.36	11.34	14.84	14.55
Na_2O				0.91	
K_2O				0.15	
H_2O+	) 6.30	) 5.80	) 5.85	1.00	1.10
H_2O-				0.07	0.21
TiO_2				0.91	0.13
Cr & Ni oxides		traces	traces		nil
Total	100.86	101.20	100.92	100.40 (100.41)	100.83
Sp.gr.		3.02	3.03		

987. **PYROXENE.** Grenville Mica Mines, Argenteuil co., Que.

31–G–E½ (Anal. B.J. Harrington) Ser. No. *1874–15*

Pale greenish grey pyroxene passing into greenish white on one hand and to dark greenish grey on the other, and associated with phlogopite and calcite. It is massive, crystalline, and often affords cleavage planes several inches long and wide. Crystals are common, occasionally 5 or 6 inches long and frequently penetrating plates of mica. It is opaque to translucent with uneven fracture and vitreous or resinous lustre.

B.J. Harrington (1876, p. 302)

988. **PYROXENE.** Lot 2, con. 9, Bathurst tp., Lanark co., Ont.

31–C–E½ (Anal. T.S. Hunt) Ser. No. *1852–6*

Massive cleavable pyroxene locally exhibiting small crystals; forms crystalline masses, mixed with a little mica, calcite, apatite, copper, pyrite, and pink wilsonite. The lustre is vitreous and pearly on cleavage surfaces. It is colourless to greyish white, translucent with an uneven sub-conchoidal fracture. Two samples, (a) and (b), were analyzed.

T.S. Hunt (1854, p. 170)

989. AUGITE. St. Bruno Mountain, Chambly co., Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1858–2*

Black pyroxene in short, thick, terminated prisms readily detached from their matrix, embedded in the olivinitic dolerite, which is a coarse-grained, granitoid, dark greenish grey rock containing also biotite, feldspar, and olivine. The augite appears flesh-coloured in thin sections.

T.S. Hunt (1859, p. 183)

990. DIOPSIDE. Montreal Chrome Pit, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1929–9*

(Unpublished data from Laboratory files)

	987	988 (a)	988 (b)	989	990
SiO_2	51.27	51.50	50.90	49.40	51.94
Al_2O_3	4.00	6.15	) 6.77	6.70	3.46
Fe_2O_3	0.10	0.35		7.83	0.23
FeO					0.49
MgO	17.46	17.69	18.14	13.06	15.93
CaO	25.27	23.80	23.74	21.88	27.15
Na_2O	0.62			) 0.74	
K_2O	0.14				
H_2O+	) 1.63				0.19
H_2O-					0.25
TiO_2					nil
P_2O_5					
MnO					0.29
CO_2					nil
LiO_2	trace				
volatile		1.10	0.90	0.50	
Total	100.49	100.59	100.45	100.11	99.93
Sp.gr.	3.35	3.19	3.19	3.341	

991. DIOPSIDE. From dyke-like bodies of diopsidic rock cutting serpentine in the form of narrow stringers and veinlets in massive chromite; Montreal Chrome Pit, lot 2, rge. 25, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. ?) Ser. No. *1918–17*

In white compact diopsidic rock. Upon the walls of fissures and drusy cavities within the massive diopside rock, the mineral occurs as small, well-formed, colourless crystals. The rock has a granitic texture and is composed entirely of diopside with the exception of a very little calcite or dolomite. The diopside is colourless, very fresh and clean, and forms fairly large interlocking idiomorphic individuals, the interstices between which are filled with granular aggregates of smaller crystals.

E. Poitevin and R.P.D. Graham (1918, p. 41)

992. **PYROXENE.** Embedded in crystalline limestone; probably a boulder in the vicinity of Ottawa, Ont.

31–G–W½ (Anal. T.S. Hunt) Ser. No. *1863–38*

Large white semi-transparent prisms often an inch in diameter and highlv modified.

Geological Survey (1863, p. 467)

993. **PYROXENE.** Lot 27, rge. 13, Templeton tp., Papineau co., Que.

31–G–W½ (Anal. B.J. Harrington) Ser. No. *1877–23*

Occurs in crystals, some apparently quite unaltered, others having been converted into hornblende for a greater or lesser depth from the surface. Some are entirely changed to hornblende and show no trace of pyroxene. The analysis is of the unaltered pyroxene.

B.J. Harrington (1879, p. 21) *See also* Nos. 1138, 1139 *(1877–24, 25)*

	991	992	993	994	995
SiO_2	54.77	54.50	50.87	50.66	50.36
Al_2O_3			4.57	4.47	4.42
Fe_2O_3	0.17		0.97	0.70	
FeO	0.89	1.98	1.96	2.75	3.34
MgO	18.46	18.14	15.37	17.45	18.21
CaO	26.33	25.87	24.44	21.81	20.85
Na_2O			0.22		
K_2O			0.50		
H_2O+				) 0.69	1.11
H_2O-					0.37
TiO_2					
P_2O_5					
MnO	0.11		0.15		
CO_2					
Cr_2O_3				1.40	0.47
volatile		0.40			
loss on ignition			1.44		
Total	100.73	100.89	100.49	99.93	99.13
Sp.gr.	3.267	3.26–3.27	3.181	3.238	

994. **DIALLAGE.** Occurs in serpentine; lot 22, rge. 2, Melbourne tp., Richmond co., Que.

31–H–E½ (Anal. R.A.A. Johnston) Ser. No. *1892–10*

Thin-foliated, massive, light greenish grey diallage with a pseudo-metallic lustre.

G.C. Hoffmann (1895, p. 18)

995. **DIALLAGE.** From a pyroxene-pyroxenite hill; short distance from the Danville Asbestos Mine, Shipton tp., Richmond co., Que.

21–E–W½ (Anal. M.F. Connor) Ser. No. *1913–7*

Pyroxene is the most abundant mineral in a dark green, holocrystalline, coarsely textured pyroxenite. Pyroxene frequently occurs in very large crystals and is sometimes altered to talc and other decomposition minerals. Remnants of olivine are occasionally found in serpentine.

J.A. Dresser (1913, p. 30)

996. **DIOPSIDE.** High Falls and the ragged chute on Madawaska River, Renfrew co., Ont.

31–F–E½ (Anal. T.S. Hunt) Ser. No. *1863–36*

Occurs as crystals of pale greenish grey pyroxene which are sometimes several inches in diameter. They are often replaced on their acute lateral edges and are associated with crystals of green hornblende and black tourmaline.

Geological Survey (1863, p. 467)

997. **TITANIFEROUS AUGITE.** In the jacupirangites and other basic differentiates of the nepheline-syenite of the Ice River complex; Ice River Valley, Kootenay district, B.C.

82–N–E½ (Anal. M.F. Connor) Ser. No. *1914–23*

Abundant titaniferous augite, black, and of rather irregular habit, with a well-marked tendency toward prismatic development. It is fine-grained with a distinct rather poorly developed cleavage. There is perhaps a suggestion of a schistose texture. It is commonly associated with barkevikitic hornblende, biotite, nephelite, apatite, sphene, and ilmenite. It occurs in irregular forms with a tendency to elongation in the direction of the vertical axis, and shows minute, black, rod-like inclusions arranged in two distinct series, one parallel to the vertical axis, and the other parallel to the 001–010 edge. Pleochroism: α = reddish or pinkish brown; β = reddish or pinkish brown; γ = pale bright yellow. Absorption $\alpha \leqq \beta > \gamma$. Strong dispersion $\rho > \nu$; maximum inclined extinction 42.3°; 2E = 59°. Indices of refraction: α = 1.725; γ = 1.746; birefringence = 0.021.

J.A. Allan (1914, p. 171)

998. PYROXENE. Granular pyroxene rock occurring with ophiolite; Orford tp., Sherbrooke co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1863–39*

Tabular twin crystals line geodes, associated with cinnamon-coloured garnets, or are grouped in bladed masses of an opaque greenish white. The crystals from the geodes were opaque and seemed somewhat earthy in their fracture.

Geological Survey (1863, p. 468)

999. DIOPSIDE. Orford tp., Sherbrooke co., Que.

31–H–E½ (Anal. R.J.C. Fabry) Ser. No. *1929–12*

Green.
(Unpublished data from Laboratory files)

1000. PYROXENE. Lot 13, rge. 11, Templeton tp., Papineau co., Que.

31–G–W½ (Anal. B.J. Harrington) Ser. No. *1877–22*

Black or blackish green pyroxene, translucent on the edges with a vitreous, sometimes almost splendent lustre, and uneven to conchoidal fracture. It is associated with green apatite, white orthoclase, scapolite, graphite, and small grains of titanite. Pyroxene crystals often contain

	996	997	998	999	1000
SiO_2	54.20	41.80	54.50	52.87	51.28
Al_2O_3		9.30		0.44	2.82
Fe_2O_3		5.44		1.03	1.32
FeO	3.24	3.30	4.86	6.69	9.16
MgO	17.02	10.82	15.29	12.93	11.61
CaO	25.65	22.89	25.20	25.40	23.34
Na_2O					
K_2O					
H_2O+		1.10		0.71	
H_2O-		0.16		0.03	
TiO_2		4.84		nil	
P_2O_5					
MnO		0.10		0.63	0.33
CO_2					
volatile	0.45		0.55		
loss on ignition					0.17
Total	100.56	99.75	100.40	100.73	100.03
Sp.gr.	3.273–3.275	3.39	3.13–3.15		3.385

little round or irregular masses of the orthoclase as well as scales of graphite and the surfaces are sometimes coated by broad plates of graphite.

B.J. Harrington (1879, p. 17)

1001. **PYROXENE**. Occurs in ijolites of the Ice River complex, Ice River Valley, Kootenay district, B.C.

82–N–E½ (Anal. M.F. Connor) Ser. No. *1914–25*

Faint greenish coloured pyroxene, slightly pleochroic, soda-rich variety. Absorption: A = grey to colourless, B = pinkish, C = faint reddish pink. C > B > A. Maximum extinction 32° – 38°.

J.A. Allan (1914, p. 171)

1002. **SPODUMENE**. From a pegmatite dyke, which is conformable with the enclosing nodular greywacke of the Yellowknife Group; 3½ miles due west from a point on the west shore of Buckham Lake, 3 miles from its north end, and about 50 miles slightly south of east from Yellowknife, District of Mackenzie, N.W.T.

85–I–E½ (Anal. R.J.C. Fabry) Ser. No. *1943–11*

The dyke shows four mineral zones of which the central two are spodumene bearing. The spodumene is evenly distributed, each zone carrying about 30% by weight, and crystals are equally large in each, ranging from 1 inch across to 10.7 feet by 1 foot. Visible impurities, chiefly quartz stringers, comprise less than 5% and no alteration products are evident.

	1001	1002	1003	1004
SiO_2	45.75	64.09	63.72	66.50
Al_2O_3	4.49	27.06	26.24	26.04
Fe_2O_3	5.09		0.90	trace
FeO	11.48	1.25	trace	0.11
MgO	7.25	0.27	0.16	0.07
CaO	20.50	0.51	0.22	0.25
Na_2O		1.59	2.25	0.92
K_2O		0.15	0.03	0.12
H_2O+	0.81		0.52	
H_2O-	0.37			
TiO_2	2.18		0.06	nil
P_2O_5				
MnO	0.19	0.02	0.06	0.01
CO_2				
Li_2O		5.70	5.77	6.47
Total	98.11	100.64	99.93	100.49
Sp.gr.	3.44			

Other minerals of the dyke include quartz, feldspar, cleavelandite, muscovite, beryl, amblygonite, tantalite-columbite, and lithiophilite.

A.W. Jolliffe (1944, p. 13)

1003. **SPODUMENE.** From a pegmatite dyke with sharp, tabular, steeply dipping walls and fairly constant composition; northeast corner of Preissac tp., Lamotte map-area, Abitibi co., Que.

32–D–E½ (Anal. R.J.C. Fabry) Ser. No. *1944–8*

Albite, microcline, quartz, and spodumene are the chief constituents with minor muscovite, in places a little pale green to pale blue beryl and more rarely tantalite-columbite. In close segregation spodumene may be 2 inches by 18 inches long.

G.W.H. Norman (1944, p. 12)

1004. **SPODUMENE.** Occurs in the lithium-rich middle zone of a pegmatite dyke cutting volcanic rocks; Bear Mineral Claim, lot 17, rge. 16, tp. 16, 10 miles northeast of Point du Bois, Man.

52–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1927–4*

Occurs as greyish to white cleavable masses characterized by unusual freshness. Indices of refraction: α = 1.660 ± 0.001; β = 1.665 ± 0.001; γ = 1.676 ± 0.001.

H.V. Ellsworth (1932, pp. 155, 266)

1005. **ANTHOPHYLLITE.** In a band of anthophyllite-rich rock; north of the lake, 2 miles north of the west end of Batty Lake map-area, Man.

63–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1949–8*

The anthophyllite-rich rock is composed mainly of yellowish brown anthophyllite in large radiating crystals, some of which are 4 inches long. Garnet is an occasional constituent and a little quartz and biotite are generally present. The anthophyllite crystals are long, brownish pink, bladed, of radiating habit, with pink to yellow-brown to yellowish pleochroism. It is optically negative with an optic angle of 75°. Indices of refraction: α = 1.651; β and γ = 1.656.

D.S. Robertson (1953, p. 19)

1006. **ANTHOPHYLLITE (GEDRITE).** From an anthophyllite-rich band of the Sherridon Group; Star Lake, Batty Lake map-area, Man.

63–N–E½ (Anal. R.J.C. Fabry) Ser. No. *1949–7*

Anthophyllite occurs in grey-green bladed crystals of radiating habit, with brownish green to yellow to brownish yellow pleochroism. It is optically negative with an optic angle of 75°, and is invariably poikiloblastic Characteristic mineral assemblages are anthophyllite-cordierite-biotite and anthophyllite-cordierite-biotite-almandine, with minor quartz and feldspar.

D.S. Robertson (1953, p. 19)

1007. **RAPHILITE**. Lanark, Lanark co., Ont.

31–F–E½ (Anal. T.S. Hunt) Ser. No. *1850–6*

A fibrous radiating grey mineral, associated with carbonate of lime and phlogopite. It occurs in delicate fibrous masses slightly divergent and often several inches long. The fibres are readily separable and brittle, somewhat elastic, with vitreous, silky lustre. The greyish colour becomes reddish on weathered surfaces.

T.S. Hunt (1852a, p. 41)

1008. **ACTINOLITE**. In beds with serpentines of the Lower Silurian Series; St. Francis, Beauce co., Que.

21–L–E½ (Anal. T.S. Hunt) Ser. No. *1856–1*

Disseminated in talc, sometimes forming great beds of very tough greenish rock. It is a finely fibrous variety without admixture. Dark greyish green, weathering nearly white.

T.S. Hunt (1857c, p. 445)

	1005	1006	1007	1008	1009
SiO_2	45.32	44.03	55.30	52.30	56.70
Al_2O_3	22.74	19.06	0.40	1.30	1.62
Fe_2O_3					3.06
FeO	14.15	19.77	6.30	6.75	7.19
MgO	16.90	15.20	22.50	21.50	17.20
CaO	1.11	1.30	13.36	15.00	10.62
Na_2O			0.80		0.64
K_2O			0.25		0.24
H_2O+					2.05
H_2O-					0.64
TiO_2	0.25	0.47			
P_2O_5					
MnO					0.30
CO_2					
Mn			traces		
NiO				traces	0.54
volatile			0.30	3.10	
Total	100.47	99.83	99.21	99.95	100.80
Sp.gr.			2.845[1]		2.941

[1] In powder

1009. **ACTINOLITE.** Westmeath tp., Renfrew co., Ont.

31–F–E½ (Anal. F.G. Wait) Ser. No. *1892–1*

Light greenish grey, fine fibrous, massive actinolite.

G.C. Hoffmann (1895, p. 15)

1010. **ACTINOLITE.** Occurs with magnetic iron ore; Madoc, Hastings co., Ont.

31–C–W½ (Anal. T.S. Hunt) Ser. No. *1869–1*

Occurs occasionally in radiating masses.

T.S. Hunt (1870, p. 259)

1011. **EDENITE.** Lot 15, rge. 9, Grenville tp., Argenteuil co., Que.

31–G–E½ (Anal. R.A.A. Johnston) Ser. No. *1900–10*

Occurs as somewhat finely laminated masses that are brownish red with a hyacinthine tinge. It is sub-transparent to transparent with a vitreous lustre and sub-conchoidal fracture. It is one of the most important constituents of a veinstone also containing pyroxene, calcite, sphene, scapolite, garnet, apatite, and graphite.

G.C. Hoffmann (1903, p. 14)

	1010	1011	1012	1013	1014
SiO_2	59.89[1]	46.09	55.05	40.02	41.0
Al_2O_3		12.93	4.50	15.55	14.6
Fe_2O_3		0.79		3.44	4.1
FeO	11.95	nil	5.85	8.60	10.5
MgO	17.15	20.82	20.95	14.37	13.2
CaO	11.01	12.91	13.44	12.21	11.6
Na_2O		2.36		2.40	2.7
K_2O		1.84		2.13	0.4
H_2O+		0.48			
H_2O-		0.18			
TiO_2					2.7
MnO		0.36			
F		2.84			
volatile			0.35		
loss on ignition				1.81	
Total	100.00	101.60	100.14	100.53	100.8
Less O≡ F		1.19			
		100.41			
Sp.gr.			3.050–3.058		

[1] By difference

1012. **PARGASITE**. High Falls on the Madawaska River, Renfrew co., Ont.

31–F–E½ (Anal. T.S. Hunt) Ser. No. *1863–27*

Finely terminated crystals of dark green pargasite, sometimes an inch in diameter, are found implanted upon, or embedded in, a greenish white pyroxene. Nearly opaque prisms.

Geological Survey (1863, p. 466)

1013. **HORNBLENDE**. McVeigh lot in Bathurst tp., Lanark co., Ont.

31–C–E½ (Anal. B.J. Harrington) Ser. No. *1873–7*

Beautiful black or dark green hornblende associated with coarsely crystalline diorite.

B.J. Harrington (1874b, p. 201)

1014. **HORNBLENDE**. From hornblendites; about 2 miles beyond the Ahnuati Valley on the north side of Knight Inlet, B.C.

92–K–W½ (Anal. W.B. Campbell) Ser. No. *1913–21*

Hornblende occurs in the form of small greenish black prisms upon which crystal faces are seldom seen, but they possess an excellent cleavage. Blade-like crystals sometimes 2 or 3 inches long.

J.A. Bancroft (1913, p. 87)

1015. **HORNBLENDE**. Near Foster's Bar, 23 miles from Lytton, Fraser River, Yale district, B.C.

91–I–W½ (Anal. F.G. Wait) Ser. No. *1892–14*

A fine-fibrous, radiated, confusedly aggregated, massive, blackish green hornblende.

G.C. Hoffmann (1895, p. 17)

1016. **WOLLASTONITE**. Grenville, Argenteuil co., Que.

31–G–E½ (Anal. Mr. Bunce) Ser. No. *1863–48*

White fibrous masses of wollastonite, several inches long, are associated with a dark green pyroxene and white feldspar to form a rock in which garnet, idocrase, sphene, pyroxene, and graphite occur.

Geological Survey (1863, p. 465)

1017. **RENSSELAERITE**. Portage du Fort, Pontiac co., Que.

31–F–E½ (Anal. B.J. Harrington) Ser. No. *1876–22*

A whitish to pale greenish grey compact or cryptocrystalline mineral, slightly waxy and translucent on the edges. It is mostly free from admixture but in places contained crystals of a white mineral, probably tourmalite.

B.J. Harrington (1878, p. 484)

1018. **RENSSELAERITE.** Occurs as a bed in crystalline limestone; lot 13, rge. 5, Grenville tp., Argenteuil co., Que.

31–G–E½ (Anal. T.S. Hunt) Ser. No. *1856–23*

Occurs as a coarsely granular mass composed of cleavable crystalline grains which are strongly coherent. It is translucent, a greenish white, pale sea-green, with a vitreous lustre, shining on cleavage surfaces and elsewhere waxy. Sectile and, when powdered, unctuous like steatite.

T.S. Hunt (1857c, p. 484)

1019. **TALC.** Occurs in a vein cutting a dark green igneous rock; lots 8 and 9 of con. 5, Grimsthorpe tp., Hastings co., Ont.

31–C–W½ (Anal. F.G. Wait) Ser. No. *1892–52*

Foliated, massive, pale yellowish green mineral with pearly lustre on the cleavage surface. It is transparent in thin laminae.

G.C. Hoffmann (1895, p. 18)

	1015	1016	1017	1018	1019
SiO_2	38.79	53.05	61.33	61.60	60.45
Al_2O_3	11.51				0.27
Fe_2O_3	16.88				0.78
FeO	15.96	1.20	0.67	1.53	2.04
MgO	2.86		31.78	31.06	29.84
CaO	11.57	45.74	trace		0.16
Na_2O	0.71				
K_2O	1.36				
H_2O+	0.83		5.85	5.60	5.42
H_2O-	0.09				0.32
MnO	0.62				
NiO					0.50
Total	101.18	99.99	99.63	99.79	99.78
Sp.gr.	3.404	2.89–2.92	2.743	2.757	2.65

1020. **TALC.** Associated with tremolitic dolomite, quartzite, and madocite dykes, all intricately folded; Henderson mine, less than ¼ mile east of Madoc village, on the southeast slope beneath a prominent knob near the north shore of Myra Lake, lot 4, con. 14, Huntingdon tp., Hastings co., Ont.

31–C–W½ (Anal. A. Sadler) Ser. No. *1926–21*

Snow-white, cream-white, or pale grey flaky to micaceous talc, which in places along the wall of the deposit is massive and deep grey or resinous-brown. The principal impurities are lenticular aggregates of calcite and dolomite, scattered crystals of pyrite, and a few prismatic crystals of tremolite. The talc flakes range from specks to sheets, ½ inch or more in diameter in the more micaceous varieties. In section the talc is seen to consist of two main varities: one a fine, massive grey talc with individual fibres not more than 1 mm long, the other a coarse micaceous type ½ inch or more in diameter. The mass of grey talc consists entirely of a felt of fine fibrous talc or of frayed-out flakes in the matrix of fine fibrous talc. The micaceous type is flaky and consists chiefly of frayed-out flakes in roughly parallel arrangement. The talc, much bent and broken in all sections, has evidently been subjected to intense deformation.

M.E. Wilson (1926, p. 82)

1021. **SERICITE.** Occurs in a sericite-schist which constitutes extensive rock masses intersected by quartz veins; from Wait-a-Bit Creek, which flows into the Columbia River about 2 miles north of Donald, East Kootenay district, B.C.

82–N–W½ (Anal. R.A.A. Johnston) Ser. No. *1892–50*

The sericite consists of very minute, white yellowish scales of pearly lustre. The schist has a foliated structure, a light brownish grey to light reddish brown colour, and a faintly glistening lustre.

G.C. Hoffmann (1895, p. 22)

1022. **CHROMIFEROUS MUSCOVITE.** Matawatchan, Renfrew co., Ont.

31–F–W½ (Anal. F.G. Wait) Ser. No. *1890–15*

A very handsome, scaly, massive, bright emerald-green muscovite with some intermixed scales of dark brown mica, a little quartz, and a few grains of pyrite.

G.C. Hoffmann (1892, p. 21)

1023. **DAMOURITE.** Kicking Horse Valley, East Kootenay district, B.C.

82–N–E½ (Anal. R.A.A. Johnston) Ser. No. *1892–9*

Occurs in the form of yellowish green, scaly aggregations in a gangue consisting of an association of a ferruginous dolomite with small particles of quartz and a little calcite, containing here and there a few particles of pyrite and in part coated with ferric hydrate. It is unctuous to the feel and of a pearly lustre.

G.C. Hoffmann (1895, p. 20)

1024. **MUSCOVITE.** In the lithium-rich middle zone of a pegmatite dyke cutting volcanic rocks; Bear Mineral Claim, lot 17, tp. 16, rge. 16, 10 miles east of Point du Bois, Man.

52–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1928–1*

Light lilac in colour, forming a massive rock composed of minute scales mostly 1 mm or less in diameter. It is distinguished from lepidolite only by its lighter colour and finer grain. Indices of refraction: α = 1.555; β = 1.588; γ = 1.595; 2V = 46°.

H.V. Ellsworth (1932, pp. 156–266)

	1020	1021	1022	1023	1024
SiO_2	53.92	46.05	43.72	44.28	45.58
Al_2O_3	0.32	38.36	35.51	33.60	37.45
Fe_2O_3	nil	0.97	2.94	0.62	0.16
FeO	0.36				
MgO	29.63	0.47	1.36	3.03	0.13
CaO	5.02	2.40	4.46		0.28
Na_2O		2.98	0.39	0.40	0.93
K_2O		6.19	8.88	9.87	10.90
H_2O+	5.05				
H_2O-		) 2.48	) 3.68	) 6.25	) 3.16
TiO_2					
P_2O_5					
MnO			0.26		0.15
CO_2	5.51				
F				0.59	0.97
Cl				0.51	
Cr_2O_3			1.26		
Li_2O		0.34			0.13
Cs_2O		0.03			
Total	99.81	100.27	102.46	99.13 (99.15)	99.84
Less O≡ F and Cl				0.36	0.41
				98.77 (98.79)	99.43
Sp.gr.			2.93	2.857	

1025. **MARGARODITE.** Associated with reddish perthitic albite in the lithium-rich middle zone of the pegmatite dyke cutting volcanic rocks; Annie Mining Claim, Silver Leaf Mining Syndicate, lot 17, tp. 16, rge. 16, 10 miles northeast of Point du Bois, Man.

52–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1929–3*

Faint lilac coloured muscovite, characterized by curved faces sometimes almost hemispherical about the C axis. It occurs, along with a silvery or pearly-grey variety of muscovite (No. 1026), as nodules sometimes several inches in diameter. The laminae are brittle and not so easily cleavable as ordinary muscovite. Indices of refraction: $\alpha = 1.542$; $\beta = 1.571$; $\gamma = 1.573$; 2V = 40°.

H.V. Ellsworth (1932, pp. 155, 167)

1026. **MUSCOVITE.** In the lithium-rich middle zone of a pegmatite dyke cutting hornblende basalt; Annie Mining Claim, Silver Leaf Mining Syndicate, lot 17, tp. 16, rge. 16, 10 miles northeast of Point du Bois, Man.

52–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1927–25*

Easily identified by its nodular form, silver or pearly lustre, and curvilaminar structure. Some of the nodules are several inches in diameter. The associated rocks are composed of a reddish perthitic albite, and a faint lilac coloured muscovite (No. 1025). The muscovite is characterized by curved faces sometimes almost hemispherical about the C axis. Indices of refraction: $\alpha = 1.555$; $\beta = 1.592$; $\gamma = 1.596$; all ± 0.002; 2V =38°.

(E. Poitevin, R.J.C. Fabry, and C.H. Stockwell)

	1025	1026	1027
SiO_2	46.56	45.36	31.32
Al_2O_3	29.53	33.21	12.20
Fe_2O_3	0.12	2.20	
FeO	0.10	2.57	5.29
MgO	0.29	0.13	2.26
CaO	0.15	0.13	
Na_2O	2.65	1.14	0.33
K_2O	11.01	11.14	5.05
H_2O+	) 3.12	) 1.41	5.25
H_2O-			
TiO_2	nil	nil	
P_2O_5			
MnO	2.32	0.90	
CO_2			
F	3.45	1.84	
Li_2O	1.80	0.90	
Cs_2O	0.33		
Rb_2O	trace		
quartz			35.96
Total	101.43	100.93	97.66
Less O≡ F	1.45	0.77	
	99.98	100.16	
Sp.gr.		2.85	

1027. GLAUCONITE. Occurs along the grains of quartz in thin layers on friable sandstone between beds of dolomitic conglomerate; Island of Orleans, Que.

21–L–E½ (Anal. T.S. Hunt) Ser. No. *1858–16*

Occurs as soft green grains. A second partial analysis gave SiO_2 31.30%; Al_2O_3 12.15%; FeO 5.27%; K_2O 5.60%.

T.S. Hunt (1859, p. 196)

1028. LEPIDOMELANE. In a fine granular arsenopyrite; at the Bob Neill Mine on lot 14, con. 10, Marmora tp., Hastings co., Ont.

31–C–W½ (Anal. F.G. Wait) Ser. No. *1892–15*

Found in considerable quantity in aggregations of brilliant black plates or scales.

G.C. Hoffmann (1895, p. 15)

1029. PHLOGOPITE. From pyroxenic rock; North Burgess tp., Lanark co., Ont.

31–C–E½ (Anal. T.S. Hunt) Ser. No. *1863–28*

Phlogopite is embedded in a pyroxenic rock with loganite, and affords plates that sometimes measure 20 by 30 inches.

Geological Survey (1863, p. 495)

1030. PHLOGOPITE. (No location given).

(Anal. R.J.C. Fabry) Ser. No. *1944–11*

(M.F. Goudge)

1031. LEPIDOLITE. Occurs in the lithium-rich middle zone of pegmatite dykes cutting volcanic rocks; Bear Mineral Claim, lot 17, tp. 16, rge. 16, 10 miles northeast of Point du Bois, Man.

52–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1927–3*

Typical lepidolite occurring as massive, deep lilac-coloured rock, composed almost entirely of small scales less than ¼ inch in diameter; Indices of refraction: α = 1.542; β = 1.570; γ = 1,573; all ± 0.002. 2V = 40°.

H.V. Ellsworth (1932, pp. 155, 264)

1032. LEPIDOLITE. From a coarse granite vein; lot 25, rge. 7, Wakefield tp., Hull co., Que.

31–G–W½ (Anal. R.A.A. Johnston) Ser. No. *1899–13*

Occurs in broad foliations having a rough distorted hexagonal contour, a pearly lustre and a light purplish colour. By reflected light in layers of 1½ inches thick it is rich purplish brown, and in thin laminae it is transparent and colourless. Occurs with quartz, microcline, albite, some aggregations of fluorite, and fine crystals of tourmaline.

G.C. Hoffmann (1901, p. 12)

	1028	1029	1030	1031	1032
SiO_2	32.79	40.97	41.58	49.06	47.89
Al_2O_3	14.34	18.56	8.81	27.22	21.16
Fe_2O_3	4.52		1.16	0.24	2.52
FeO	26.32			trace	
MgO	4.68	25.80	31.40	0.52	0.36
CaO	1.45		0.84	0.44	
Na_2O	2.00	1.08	0.32	1.92	1.34
K_2O	7.24	8.26	6.14	11.03	10.73
H_2O+	3.68		8.40	1.95	1.90[1]
H_2O-	1.38				
TiO_2	0.92		0.12	nil	
P_2O_5					
MnO	0.29			0.90	4.19
CO_2					
F			0.93	4.30	7.41
Li_2O				3.39	5.44
Cs_2O				0.21	
volatile		1.00			
loss on ignition		4.33			
Total	99.61	100.00	99.70	101.18	102.94
Less O≡ F			0.40	1.81	3.12
			99.30	99.37	99.82
Sp.gr.	3.19				2.858

[1] By direct estimation

1033. LEPIDOLITE ? From the lithium-rich middle zone of a pegmatite dyke cutting volcanic rocks; Bear Mineral Claim, lot 17, rge. 16, tp. 16, 10 miles northeast of Point du Bois, Man.

52–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1927–8*

Occurs as veinlets an inch or more wide in albite and as borders surrounding large spodumene crystals between the spodumene and the enclosing albite. It has a radiating, narrow, fan-shaped structure normal to the vein wall, and the cleavage surfaces show a fine radiating wrinkling parallel to the long direction of the fans. Sometimes occurs as rosettes with fine wrinkling radiating from the centres. Indices of refraction: $\alpha = 1.533$; $\beta = 1.578$; $\gamma = 1.581$; $2V = 41°$.

H.V. Ellsworth (1932, p. 264)

1034. **SAPONITE ?** About 15 miles northwest of the River Desert post office, Egan tp., Hull co., Que.

31–K–E½ (Anal. R.A.A. Johnston) Ser. No. *1910–9*

Occurs with a dark green or greenish black amphibole in scattered patches in rocks composed of coarse masses of white quartz and feldspar. It has a characteristic wax-like texture and slightly soapy feel and is uniform pale yellowish grey. Undoubtedly it has been derived by alterations from the amphibole, with which it is generally mixed.

R.A.A. Johnston (1911, p. 260)

1035. **LOGANITE.** In a white crystalline limestone; Calumet Falls, Litchfield tp., Pontiac co., Que.

31–F–E½ (Anal. T.S. Hunt) Ser. No. *1850–3*

Occurs in short, thick, oblique rhombic prisms replaced on the edges, or on the acute solid angles, and is associated with pale green serpentine, brown phlogopite and apatite. There is a distinct cleavage with the sides and the base of the prism and an imperfect one with the longer diagonal. The surface of the crystal is dull, the lustre of cleavages

	1033	1034	1035 (a)	1035 (b)	1036
SiO_2	47.18	42.76	32.84	32.14	35.14
Al_2O_3	31.80	4.32	13.37	13.00	10.15
Fe_2O_3	0.07	2.57	2.00	2.28	
FeO	0.16				8.60
MgO	0.28	25.30	35.12	36.43	31.47
CaO	0.40	1.92	0.96	0.93	
Na_2O	2.94				
K_2O	10.50				
H_2O+ / H_2O-	2.40	23.13			14.64
TiO_2					
P_2O_5					
MnO	2.05				
CO_2					
F	2.15				
Li_2O	1.06				
volatile			17.02	16.83	
Total	100.99	100.00	101.31	101.61	100.00
Less O≡ F	0.89				
	100.10				
Sp.gr.		2.162	2.60–2.64	2.60–2.64	

vitreous and shining. The colour is clove-brown or chocolate-brown, often pale, and the mineral is sub-translucent, brittle, and with an uneven fracture.
Two analyses, (a) and (b), were made.

Geological Survey (1863, p. 491)

1036. LOGANITE. Deposited in the cells and chambers of *Eozoon canadense* left vacant by the disappearance of the animal matter from the calcareous skeleton; Burgess tp., Lanark co., Ont.

31–C–E½ (Anal. T.S. Hunt) Ser. No. *1866–1*

The loganite is a cast of the soft parts of the animal in which not only chambers and connecting canals but the minute tubuli and pores are represented by solid mineral.

T.S. Hunt (1866, p. 232)

1037. CHLORITE. In a compact serpentine rock; Montreal chrome pit, Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1930–6*

Occurs in green plates.

(Unpublished data from Laboratory files)

1038. CLINOCHLORE. Lot 24, rge. 12, Buckingham tp., Papineau co., Que.

31–G–W½ (Anal. R.A.A. Johnston) Ser. No. *1892–6*

White or faint bluish white mineral with a pearly lustre, occurring in the form of scales of more or less broadly foliated aggregations distributed through a rock composed of white scapolite and light green-yellow serpentine. It is transparent in thin laminae.

G.C. Hoffmann (1895, p. 17)

1039. CLINOCHLORE. Lot 16, con. 7, Bagot tp., Renfrew co., Ont.

31–F–E½ (Anal. R.A.A. Johnston) Ser. No. *1892–5*

Broadly foliated, dark green, transparent mineral with pearly lustre.

G.C. Hoffmann (1895, p. 18)

1040. COLERAINITE. Lining irregular druses in a vein of somewhat cavernous pegmatitic material which intersects massive serpentine; from the dump at the Old Standard mine, Block A, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. M.F. Connor) Ser. No. *1918–21*

Occurs in the form of extremely hexagonal flakes lining irregular druses. They appear as a crust of 1 or 2 mm thick upon a fine granular to compact matrix, or as spheroidal aggregates of rosettes (botryoidal structure) in which the nucleus of each little sphere is the same matrix material. The entire vein is composed almost exclusively of this compact material, there being only a little associated brown platy mica and the occasional small crystal of garnet and zircon, and some pale green actinolite in short radiating fibres. The individual crystals are essentially colourless and translucent with a vitreous lustre. In bulk the pure mineral appears white with a glistening or dull lustre depending on the size of the crystal. The compact matrix is generally white with a dull matte lustre. Adjacent to the crystals there is usually a narrow translucent and nearly colourless zone, and thus a tendency for the material to be banded. The crystal flakes are isotropic and yield a uniaxial figure. Birefringence is positive and weak, with the mean refractive index about 1.56. Drusy cavities are everywhere bordered by aggregates of colerainite crystals, which are almost without exception wedge-shaped. The simultaneous extinction in such groups of four component wedges inclined at 90° to one another gives rise to a black cross, which revolves as the section is turned on the stage. Frequently the wedges are traversed by a series of fine lines parallel to their base. This relatively coarsely crystallized material forms a zone of fairly uniform width around the margin of each druse. Below this the structure abruptly becomes very fine grained, although under a higher power. The material is seen to be similar and to display the same radial arrangement.

Analyses:
(a) crystals of the colerainite;
(b) of the matrix.

E. Poitevin and R.P.D. Graham (1918, p. 68)

	1037	1038	1039	1040 (a)	1040 (b)
SiO_2	34.39	28.65	27.23	24.40	26.98
Al_2O_3	17.35	18.96	19.44	22.77	16.10
Fe_2O_3	2.94		2.17	0.45	0.22
FeO	2.70		4.91		nil
MgO	31.08	37.49	32.67	32.70	36.56
CaO	2.08			0.10	0.12
Na_2O	0.34			} 0.30	} 0.28
K_2O	nil		0.08		
H_2O+	9.25	} 15.22[1]	} 12.04[2]	} 19.63	} 19.91
H_2O-	0.08				
TiO_2	nil				
P_2O_5					
MnO	nil			0.09	0.20
CO_2	nil				
Cr_2O_3			0.99		
Total	100.21	100.32	99.53	100.44	100.37
Sp.gr.		2.631		2.51	2.44

[1] By ignition
[2] By direct estimation

1041. COLERAINITE. From a vein of somewhat cavernous pegmatitic material, which intersects massive serpentine; from the dump near the Union Pit, Block B, lot 28, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. M.F. Connor) Ser. No. *1918–22*

Occurs with a botryoidal form as spherical aggregates of rosettes in which the nucleus of each little sphere is a fine granular to compact matrix. The spheres vary from ⅛ to ½ inch and are composed of compact material with only a very thin imperfectly crystalline crust on their surface. The compact material is concentrically banded immediately adjacent to the crystalline crust. The material is commonly translucent and nearly colourless, and this zone is followed by banding of white, pale cream, and pink. Altogether the specimens have very much the appearance of banded chalcedony.

E. Poitevin and R.P.D. Graham (1918, p. 70)

1042. CHLORITE. Northwest half of lot 18, rge. 9, Templeton tp., Papineau co., Que.

31–G–W½ (Anal. B.J. Harrington) Ser. No. *1877–12*

A green chlorite-like mineral associated with apatite, quartz, iron pyrites, and calcite, and occurring in uneven folia mostly olive-green, with a pearly lustre. The folia are flexible but scarcely elastic.

B.J. Harrington (1879, p. 34)

1043. CHLORITE. In a massive bed of slaty chlorite, lot 26, rge. 6, Potton tp., Brome co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1856–2*

Pale greenish grey material composed of lamellae of chlorite in such a way as to give a schistose structure to the mass. Unctuous to the touch.

T.S. Hunt (1857c, p. 447)

1044. "CHAMOSITE". From a sandstone 3 inches above zone 4, location 215 d8, Wabana Iron Ore Formation, Belle Island, Nfld.

1–N–E½ (Anal. A.O. Hayes) Ser. No. *1914–67*

A chamositic sandstone 3 inches thick overlies zone 4 and is composed almost entirely of equal parts of chamosite and quartz, frequently so close together as to suggest simultaneous formation. Most of the quartz is detrital with considerable number of grains crystallized diagenetically. Much of the chamosite is microcrystalline, some is cryptocrystalline or amorphous, and some is coarsely crystalline. Minute grains resembling detrital zircon and sphene are scattered through it. There is a suggestion of leucoxene. Laminated, wavy, dark bands are argillaceous and carbonaceous matter.

A.O. Hayes (1915, p. 53)

1045. "CHAMOSITE". From a sandstone 3 inches above zone 4, Scotia Ore, location 215 d8, Wabana Iron Ore Formation, Belle Island, Nfld.

1–N–E½ (Anal. A.O. Hayes) Ser. No. *1915–68*

A chamositic sandstone 3 inches thick overlies zone 4, and is composed almost entirely of equal parts of chamosite and quartz, frequently so close together as to suggest simultaneous formation. Most of the quartz is detrital with considerable number of grains crystallized diagenetically. Much of the chamosite is microcrystalline, some is cryptocrystalline or amorphous, and some is coarsely crystalline. Minute grains resembling detrital zircon and sphene are scattered through it. There is a suggestion of leucoxene. Laminated, wavy dark bands are argillaceous and carbonaceous matter.

A.O. Hayes (1915, p. 58)

	1041	1042	1043	1044	1045
SiO_2	33.00	35.80	29.60	62.83	10.56
Al_2O_3	13.12	13.18	19.70	9.96	9.61
Fe_2O_3		4.28		5.37	2.83
FeO		10.18	14.49	14.69	14.69
MgO	35.30	22.80	25.95	1.43	1.42
CaO	trace			0.69	0.49
Na_2O	0.15			0.19	
K_2O	0.11			0.11	
H_2O+	16.12	12.64 (H₂O+ and H₂O−)	11.30	5.42	4.74
H_2O-	2.55			0.27	0.92
TiO_2					0.98
P_2O_5				0.30	0.30
MnO					0.14
CO_2				nil	0.13
insoluble					53.87
Total	100.35	98.88	101.04	101.26	100.68
Sp.gr.	2.34–2.35	2.61		2.93	2.93

1046. "CHAMOSITE". Immediately above the ore; Scotia Bed, zone 4, location 206 J 4b, Wabana Iron Ore Formation, Belle Island, Nfld.

1–N–E½ (Anal. A.O. Hayes) Ser. No. *1915–64*

From a green ferruginous chamositic sandstone 9 inches thick.

A.O. Hayes (1915, p. 52)

1047. "CHAMOSITE". From an oolitic hematite and chamosite ore from the lowest band of workable ore; location 215 d2, Scotia Bed zone, Wabana Iron Ore Formation, Bell Island, Nfld.

1–N–E½ (Anal. A.O. Hayes) Ser. No. *1915–65*

The ore band is 5½ inches thick and consists of spherules of hematite in a groundmass of chamosite. The nuclei of the spherules are chamosite. Fragments of quartz occur in the groundmass. The chamosite appears to be microcrystalline.

A.O. Hayes (1915, p. 53)

1048. **COOKEITE.** From the schist and from small cavities in quartz veins traversing the schist; Wait-a-Bit Creek, which flows into Columbia River about 2 miles north of Donald, East Kootenay district, B.C.

82–N–W½ (Anal. R.A.A. Johnston) Ser. No. *1892–7*

Occurs in the form of thin layers in the schist and in small cavities in the quartz veins. It occurs in crystalline, foliated, translucent masses of a faint greyish white to white or silvery white and pale apple-green. In thin folia it is colourless and transparent with a pearly lustre and greasy feel.

G.C. Hoffmann (1895, p. 22)

1049. **CHLORITOID.** From mica schist of the Quebec Group; Leeds tp., Megantic co., Que.

21–L–W½ (Anal. T.S. Hunt) Ser. No. *1858–3*

Occurs in small lamellar masses rarely more than ¼ inch broad and ⅛ inch thick. In some specimens there occur spherical masses ½ inch or more

	1046	1047	1048	1049	1050
SiO_2	63.33	15.29	32.00	26.30	44.60
Al_2O_3	11.68	9.63	45.87	37.10	39.15
Fe_2O_3	0.46	44.17			1.04
FeO	17.88	19.38		25.92	
MgO	1.49	1.45	0.78	3.66	0.21
CaO	0.27	1.54	1.63		0.39
Na_2O		0.46	0.65		0.27
K_2O		0.08	0.06		0.20
H_2O+	4.90	5.80	17.29	6.10	} 14.24
H_2O-	0.26	0.83			
TiO_2	0.49				
P_2O_5	0.07	1.07			
MnO	0.10	0.26		0.93	
CO_2	0.30	0.43			
F			0.02		
Li_2O			2.10		
Total	100.96	100.39	100.40	100.01	100.10
Less O≡ F	(101.23)		0.01		
			100.39		
Sp.gr.	2.86			3.513[1]	2.577

[1] Density

in diameter. The lamellae are often curved and are not easily separable. It is dark greenish grey to black, appearing brilliant black upon the faces of perfect cleavage, which have a vitreous lustre. Surfaces of fracture have a feeble, waxy lustre.

T.S. Hunt (1859, p. 194)

1050. **KAOLINITE.** Lot 25, rge. 5, Acton tp., Bagot co., Que.

31–H–E½ (Anal. G.C. Hoffmann) Ser. No. *1874–6*

Occurs lining cavities in rock, and is composed of minute pearly scales of yellowish colour. In a freshly collected state it is unctuous and plastic.

G.C. Hoffmann (1876, p. 314)

1051. **PHOLERITE.** Filling fissures in a bed of sandstone of the Quebec Group; just below the falls of Chaudière River near Quebec City, Que.

21–L–W½ (Anal. T.S. Hunt) Ser. No. *1854–9*

Made up of minute soft scales very unctuous to the touch with a silvery lustre. It sometimes forms masses ½ inch thick, which are greenish or yellowish white and have little coherence.

T.S. Hunt (1857b, p. 386)

1052. **KAOLIN.** From test pits along a quartzite ridge; on the east side of the wagon road 7 miles from Huberdeau on the road to St. Remi D'Amerst, Arundel tp., Argenteuil co., Que.

31–G–E½ (Anal. G.E.F. Lundell) Ser. No. *1911–4*

Crude kaolin is a mixture of fine-grained white clay particles and angular fragments of quartz with a little tourmaline occasionally present. In some parts of the vein the material is almost free from quartz but in most proportions this mineral forms about 50% of the mass. The washed product was analyzed.

H. Ries (1912a, p. 230)

1053. **KAOLIN.** Occurs in a dyke 1 foot to 3 feet thick, cutting through massive beds of Potsdam sandstone; Grand Frenier, Two Mountains co., Que.

31–G–E½ (Anal. G.C. Hoffmann) Ser. No. *1878–11*

Occurs in compact friable masses with a greasy feel and fine earthy texture. Light brownish yellow mottled with white.

G.C. Hoffmann (1880, p. 7)

1054. **SERPENTINE.** Lot 20, con. 1, Ireland tp., Megantic co., Que.

21–L–W½ (Anal. T.S. Hunt) Ser. No. *1851–9*

Almost opaque greyish green.

T.S. Hunt (1852b, p. 99)

1055. **PORCELLOPHITE.** Megantic Mine and Hall Chromepit, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. ?) Ser. No. *1918–24*

Compact clay-like material with a smooth flat conchoidal porcelain-like fracture. Material from Megantic mine is very pale grey and that from the Hall chromepit is pale brown.

E. Poitevin and R.P.D. Graham (1918, p. 78)

	1051	1052	1053	1054	1055
SiO_2	46.05	46.13	32.01	43.70	50.29
Al_2O_3	38.37	39.45	29.91	) 23.00	) 6.23
Fe_2O_3		0.72	14.02		
FeO					1.00
MgO	0.63		0.25	23.46	29.99
CaO	0.61		0.41		nil
Na_2O		0.09	traces		
K_2O		0.20	traces		
H_2O+	) 14.00		) 13.01	) 11.57	10.20
H_2O-					3.10
TiO_2					
P_2O_5					
MnO					
CO_2					
CrO			0.55		
titanic acid			9.56		
loss on ignition		13.81			
Total	99.66	100.40	99.72	101.73	100.81
Sp.gr.				2.652–2.658	

1056. **SERPENTINE.** From a calcareous ophiolite; lot 10, rge. 6, Orford tp., Sherbrooke co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1856–19*

T.S. Hunt (1857c, p. 436)

1057. **SERPENTINE.** Associated with chromic iron; Bolton and Melbourne tps., Brome and Richmond counties, Que.

31–H–E½ (Anal. B.J. Harrington) Ser. No. *1874–18*

Massive or slightly foliated translucent to subtranslucent, pale violet to deeper violet serpentine, with a greasy to somewhat pearly lustre.

B.J. Harrington (1876, p. 304)

1058. **SERPENTINE.** From a conglomerate ophiolite of Silurian age; lot 12, rge. 18, Orford tp., Sherbrooke co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1856–24*

Blackish green with conchoidal fracture. It contains a small quantity of chromic iron.

T.S. Hunt (1857c, p. 435)

1059. **SERPENTINE.** From a vein about 1 inch wide; Lambly mine near Coleraine village, Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1935–11*

The vein is flanked by altered zones, and in this way resembles an asbestos vein.

H.C. Cooke (1937, p. 123)

1060. **SERPENTINE.** From serpentine deposits which occur along, or near fracture or shear zones in the greenstone underlying the Ladner Series; Cache Creek Group, Coquihalla River, Yale district, B.C.

92–H–W½ (Anal. M.F. Connor) Ser. No. *1924–4*

The pure serpentine has a beautifully bladed structure and bluish birefringence. It is intersected by talc and calcite veinlets. A few grains of magnetite are present. The texture is minutely fibrous and bladed and seems to have resulted from gradual but complete replacement of both the feldspathic and the mafic minerals of the greenstone.

C.E. Cairnes (1924, p. 35)

	1056	1057	1058	1059	1060
SiO_2	41.20	43.94	42.90	36.61	38.84
Al_2O_3	2.67	5.69 (with Fe_2O_3)		nil	0.10
Fe_2O_3				12.63	6.49
FeO	11.16		7.47	3.29	3.60
MgO	32.16	34.80	36.28	36.69	36.90
CaO	0.65	1.22		0.07	traces
Na_2O					0.13 (with K_2O)
K_2O					
H_2O+	12.70 (with H_2O-)		13.14 (with H_2O-)	10.33	13.03
H_2O-		14.54		0.65	0.27
TiO_2					
P_2O_5					
MnO					0.14
CO_2				0.10	0.23
Cr_2O_3		0.67	0.25		0.37
NiO			0.15	trace	0.16
Total	100.54	100.86	100.19	100.37	100.26
Sp.gr.			2.622		

1061. **SERPENTINE.** From white lamellar dolomite of Laurentian age; Grenville tp., Argenteuil co., Que.

31–G–E½ (Anal. T.S. Hunt) Ser. No. *1856–28*

Honey-yellow grains of serpentine were separated from a white lamellar dolomite.

T.S. Hunt (1857c, p. 482)

1062. **SERPENTINE.** Lower pit, Megantic Lambly mine, Ireland tp., Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1930–5*

White.
(Unpublished data from Laboratory files)

1063. **SERPENTINITE.** From the Cassiar serpentinite body; 3 miles north of Cassiar, B.C.

104–P–W½ (Anal. J.A. Maxwell) Ser. No. *1954–40*

	1061	1062	1063	1064	1065
SiO_2	44.10	45.23	40.78	37.42	41.20
Al_2O_3		0.56	1.20	0.34	
Fe_2O_3	1.15	0.44	3.37	1.79	0.80
FeO		0.08	0.04	3.00	
MgO	40.05	40.28	40.47	43.27	43.52
CaO		1.07	nil	trace	
Na_2O			nil		
K_2O			nil		
H_2O+	14.70	12.19	12.76	13.51	15.40
H_2O-		1.29	1.18	0.29	
TiO_2		nil	0.01	nil	
P_2O_5			nil		
MnO		nil	0.03	0.12	
CO_2		nil	0.21	nil	
S		0.14		nil	
Cr_2O_3			0.16	0.39	
NiO			0.13	0.05	
Total	100.00	100.28 (101.28)	100.34	100.18	100.92
Less O≡S		0.06			
		100.22 (101.22)			
Sp.gr.				2.67	2.36–2.38

This type of serpentinite occurs in a veinlet about ½ inch wide which cuts antigoritic serpentinite, the host rock for the chrysotile asbestos at Cassiar.

H. Gabrielse (1960, p. 332) *See also* Nos. 296, 435, 436, 437, 1069 *(1955–5; 1954–39, 22, 20; 1955–1)*

1064. **SERPENTINE.** Serpentine from the altered zone adjoining an asbestos vein; Bell pit, Thetford Mines, Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1934–20*

Olivine and pyroxene have been completely replaced by serpentine with about 25% brucite. The texture of the brucite shows that it has replaced antigorite laths.

H.C. Cooke (1937, p. 113)

1065. **SERPENTINE.** Laurentian age; Calumet Island, Pontiac co., Que.

31–F–E½ (Anal. T.S. Hunt) Ser. No. *1850–8*

Pale wax yellow.

T.S. Hunt (1852a, p. 42)

1066. **ASBESTOS.** Vimy Ridge, Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1930–3*

Coarse fibre asbestos from which weathered parts have been cut.
(Unpublished data from Laboratory files)

1067. **ASBESTOS.** Locality unknown.

(R. Harvie) (Anal. M.F. Connor) Ser. No. *1921–26*

	1066	1067	1068	1069	1070
SiO_2	42.43	42.80	40.91	42.24	39.99
Al_2O_3	0.90	0.32	0.64	0.48	1.19
Fe_2O_3	0.90	0.38	0.55	1.37	1.10
FeO	1.56	0.88	1.70	0.16	1.15
MgO	40.69	41.33	41.64	41.88	42.11
CaO	0.13	traces	traces	nil	trace
Na_2O				nil	
K_2O				nil	
H_2O+	} 13.86	13.57	13.80	12.49	} 14.52
H_2O-		0.45	0.60	0.90	
TiO_2	nil	nil	nil	nil	nil
P_2O_5				nil	
MnO	0.11	0.08	0.08	0.05	0.05
CO_2				0.06	
Cr_2O_3			trace	0.16	
NiO		trace	trace	0.17	
Total	100.58	99.81	99.92	99.96	100.11

1068. **ASBESTOS.** Locality unknown.

(Anal. M.F. Connor) Ser. No. *1921–25*

(R. Harvie)

1069. **CHRYSOTILE ASBESTOS.** Cassiar Asbestos Corporation property, Cassiar, B.C.

104–P–W½ (Anal. J.A. Maxwell) Ser. No. *1955–1*

Fibrous asbestos typical of that found on the property, occurring in cross fibre veinlets up to 2 inches wide cutting green waxy-looking serpentinite. It has low birefringence and indexes greater and less than balsam. It has parallel extinction and is length slow.

H. Gabrielse (1960, p. 332) *See also* Nos. 296, 435, 436, 437, 1063 *(1955–5; 1954–39, 22, 20, 40)*

1070. **ASBESTOS.** Thetford, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1930–2*

Fine fibre asbestos.
(Unpublished data from Laboratory files)

1071. **ASBESTOS.** Bell Pit, Thetford Mines, Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1934–19*

An asbestos vein about an inch wide. This specimen is one of a series showing an asbestos vein, the altered zone flanking it and the country rock beyond the zone of alteration by the vein.

(H.C. Cooke) *See also* Nos. 1065, 210 *(1934–20, 18)*

1072. **ASBESTOS.** Locality unknown.

(Anal. M.F. Connor) Ser. No. *1921–28*

Asbestos with some serpentine, magnetite, etc.

(R. Harvie)

1073. **ASBESTOS.** Lake Station, Ireland tp., Megantic co., Que.

21–L–W½ (Anal. M.F. Connor) Ser. No. *1913–1*

The asbestos vein parallels the serpentine band in which it occurs and is invariably accompanied by a band of pure serpentine on either side. The serpentine occurs in a body of peridotite, which is, in places, dunite.

J.A. Dresser (1913, p. 60) *See also* Nos. 218, 434 *(1913–2, 3)*

1074. **ASBESTOS.** Locality unknown.

(Anal. M.F. Connor) Ser. No. *1921–27*

(R. Harvie)

1075. **PICROLITE.** Silurian age; lot 7, rge. 8, Bolton tp., Brome co., Que.
31–H–E½ (Anal. T.S. Hunt) Ser. No. *1856–30*

Fibrous, very compact, calandine-green mineral with splintery fracture. It shows an oblique cleavage, silky vitreous lustre and is transparent in small fragments.

T.S. Hunt (1857b, p. 346)

	1071	1072	1073	1074	1075
SiO_2	36.53	37.75	39.62	42.93	43.70
Al_2O_3	) 8.71	0.73	0.81	1.04	
Fe_2O_3		6.83	4.52	1.45	
FeO	6.00	3.77	1.90	1.02	3.51
MgO	37.93	38.12	39.73	40.40	40.68
CaO	0.05	traces	trace	traces	
Na_2O					
K_2O					
H_2O+	10.25	12.13	13.32	12.72	) 12.45
H_2O-	0.32	0.33	0.43	0.57	
TiO_2		nil		nil	
P_2O_5					
MnO		0.07		0.07	
CO_2	nil				
NiO		0.05		traces	
Total	99.79	99.79 (99.78)	100.33	100.20	100.34
Sp.gr.					2.607

1076. **RETINALITE.** A Laurentian serpentine found embedded in a white limestone; Grenville, Argenteuil co., Que.

31–G–E½ (Anal. T.S. Hunt) Ser. No. *1850–7*

Honey-yellow to oil-green, resinous, shining mineral with conchoidal fracture.
Two analyses, (a) and (b), were made.

T.S. Hunt (1852a, p. 42)

1077. **APHRODITE.** Fills fissures in rensselaerite lot 13, rge. 5, Grenville tp., Argenteuil co., Que.
31–G–E½ (Anal. T.S. Hunt) Ser. No. 1856–22

Yellowish white earthy mineral, very soft and sectile. Some parts ot tne mass contain disseminated scales of silvery mica.

T.S. Hunt (1857c, p. 484)

1078. **APHRODITE.** Found either in serpentine or in filling druses in apatite; Jacobs Asbestos Mine, Thetford, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1929–7*

Buff in colour, resembling clay, with a flat conchoidal porcelain-like fracture. Derived from surface water.
(Unpublished data from Laboratory files)

1079. **ANALCITE.** In a dyke in the reservoir extension at Montreal, Que.

31–H–W½ (Anal. B.J. Harrington) Ser. No. *1877–2*

Analcite occurs as white spots as much as an inch across in a dark dyke, with microscopic scales of dark brown mica and acicular prisms of hornblende. The analcite appears very transparent and shows but few inclusions. It is traversed by numerous reticulating cracks but displays no characteristic cleavage. The feldspar is mostly dull, but here and there shows its triclinic character.

B.J. Harrington (1879, p. 45)

1080. **ANALCITE.** From fragments of blairmorite in a 3-foot stratum of tuffaceous analcite breccia; in the valley of the South Fork River, Alta.

82–G–E½ (Anal. M.F. Connor) Ser. No. *1914–32*

Blush-red phenocrysts of analcite up to 1 inch in diameter are evenly distributed through a dark olive-green matrix and form half of the rock.

	1076 (a)	1076 (b)	1077	1078	1079	1080
SiO_2	39.34	40.10	46.66	52.28	53.29	54.16
Al_2O_3				2.11	23.33	22.35
Fe_2O_3	1.80	1.90		3.50	trace	0.92
FeO			1.33	0.29		0.06
MgO	43.02	41.65	38.05	29.01	trace	0.25
CaO				0.59	0.64	0.60
Na_2O		0.90			14.54	12.49
K_2O						0.59
H_2O+	) 15.09	) 15.00		7.81	) 8.47	8.50
H_2O-				4.50		
TiO_2						0.15
P_2O_5						
MnO				0.02		trace
CO_2						0.30
loss on ignition			13.96			
Total	99.25	99.55	100.00	100.11	100.27	100.37
Sp.gr.	2.47–2.52	2.47–2.52			2.255	

The analcite is distinguished with difficulty from garnet. Large phenocrysts occur in a finely crystalline groundmass of a second generation of analcite, aegirite-augite, nephelite, sanidine, and melanite, which are in turn embedded in an unresolvable matrix. The analcite phenocrysts are faintly pink, homogeneous, and isotropic. Cubic cleavage is well developed and faint dust-like inclusions are seen along cleavage cracks. Narrow rims of clear analcite border most phenocrysts. Alteration to calcite is frequent.

J.D. MacKenzie (1914, p. 24)

1081. **PERISTERITE.** In a coarse-grained granite; Bathurst tp., Lanark co., Ont.

31–C–E½ (Anal. T.S. Hunt) Ser. No. *1850–4*

White, passing into pearl-grey and reddish and showing an opalescence in which blue predominates, mingled however with pale green and yellow. In some parts of the rock quartz is disseminated through the peristerite to give rise to a graphic granite, but large cleavable masses are free from this admixture and exhibit the usual striations of the crystals of the triclinic feldspars.

T.S. Hunt (1852a, p. 38)

1082. **OLIGOCLASE.** From the diorite (essexite) of Mount Johnson; Iberville co., Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1858–18*

Occurs in crystals ½ inch in diameter, which weather to an opaque-white. It is white, or rarely greenish or greyish with vitreous lustre inclining to pearly.

T.S. Hunt (1859, p. 181)

1083. **FELDSPAR.** Fournier mine, South Sherbrooke tp., Lanark co., Ont.

31–C–E½ (Anal. B.J. Harrington) Ser. No. *1873–3*

White to pale grey, resembling oligoclase or andesite.

B.J. Harrington (1874b, p. 198)

1084. **FELDSPAR.** From micaceous diorite; Beloeil, Verchères co., Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1858–12*

Cleavable grains of white, vitreous feldspar, appearing to be an admixture of albite and anorthite.

T.S. Hunt (1859, p. 181)

1085. **ANDESINE.** From anorthosite; Chateau Richer, Montmorency co., Que.

21–M–E½ (Anal. T.S. Hunt) Ser. No. *1854–3*

Reddish cleavable feldspar occurring in large striated masses with hypersthene and ilmenite.
Three analyses, (a), (b), and (c), were made.

T.S. Hunt (1857b, p. 376)

	1081	1082	1083	1084	1085 (a)
SiO_2	66.80	62.05	58.58	58.30	59.55
Al_2O_3	21.80	22.60	24.78	) 24.72	25.62
Fe_2O_3	0.30	0.75	traces		0.75
FeO					
MgO	0.20		0.20	0.91	traces
CaO	2.52	3.96	4.84	5.42	7.73
Na_2O	7.00	7.95	6.63	6.73	5.09
K_2O	0.58	1.80	2.15	2.74	0.96
H_2O+			) 1.85		
H_2O-					
TiO_2............					
P_2O_5					
MnO					
CO_2					
volatile	0.60	0.80		0.50	0.45
Total	99.80	99.91	99.03	99.32	100.15
Sp.gr.	2.625	2.631	2.63–2.64		2.66–2.67

1086. **FELDSPAR.** From the andesine-anorthosite phase of a small boss that is on the margin of a belt of masses extending throughout Quebec; St. Urbain area, Charlevoix district, Que.

21–M–E½ (Anal. A.H. Phillips) Ser. No. *1922–5*

Orthoclase in perthitic intergrowth forms an average of 15% of the feldspar. Little or none is interstitial to the plagioclase grains. The feldspar forms over 98% of the rock.

J.B. Mawdsley (1927, p. 25)

1087. **FELDSPAR.** Chateau Richer, Montmorency co., Que.

21–M–E½ (Anal. T.S. Hunt) Ser. No. *1854–6*

Greenish, finely granular, strongly coherent material, which forms the base for andesine (No. 1085).

T.S. Hunt (1857b, p. 377)

1088. **ANDESINE.** Lachute, Argenteuil co., Que.

31–G–E½ (Anal. T.S. Hunt) Ser. No. *1854–1*

Occurs in large, finely striated, cleavable masses in a greenish granular base. It is semi-transparent, lavender-blue passing into sapphire-blue and is intermediate between andesine and labradorite.

T.S. Hunt (1857b, p. 381)

	1085 (b)	1085 (c)	1086	1087	1088
SiO_2	59.85	59.80	58.52	58.50	58.15
Al_2O_3	25.55	25.39	25.67	25.80	26.09
Fe_2O_3	0.65	0.60	0.43	1.00	0.50
FeO					
MgO	0.11	0.11	0.14	0.20	0.16
CaO	6.94	7.78	7.97	8.06	7.78
Na_2O	5.09	5.14	6.55	5.45	5.55
K_2O	0.96	1.00	0.81	1.16	1.21
H_2O+					
H_2O-					
TiO_2			0.05		
P_2O_5					
MnO					
CO_2					
volatile	0.30				0.45
loss on ignition				0.40	
Total	99.45	99.82	100.14	100.57	99.89
Sp.gr.	2.66–2.67	2.66–2.67		2.67	2.687

1089. **PLAGIOCLASE.** From a boulder at Chateau Richer, Montmorency co., Que.

21–M–E½ (Anal. T.S. Hunt) Ser. No. *1854–5*

Pale lavender-blue, vitreous, semi-transparent feldspar in large cleavable striated masses, often with curved surfaces and occurring in a reddish brown granular base. Its composition is between that of andesine and labradorite.
(Unpublished data from Laboratory files)

1090. **PLAGIOCLASE (LABRADORITE).** From a large boulder at St. Joachim, Montmorency co., Que.

21–M–E½ (Anal. T.S. Hunt) Ser. No. *1854–2*

Embedded in a reddish granular base with grains of ilmenite and brown mica.

T.S. Hunt (1857b, p. 379)

1091. **FELDSPAR.** From the andesine-anorthosite phase of a small boss that is on the margin of a belt of masses extending throughout Quebec; St. Urbain area, Charlevoix district, Que.

21–M–E½ (Anal. A.H. Phillips) Ser. No. *1922–4*

Andesine anorthosite makes up half the rock mass and contains less ferromagnesian mineral than do more basic phases. Orthoclase rods are rarely evenly distributed throughout the plagioclase and are sometimes confined to zones or twin lamellae. Feldspar constitutes over 97% of the analyzed material.

J.B. Mawdsley (1927, p. 25) *See also* Nos. 1086, 1098 (*1922–5*, 6)

1092. **PLAGIOCLASE (LABRADORITE)**. Chateau Richer, Montmorency co., Que.

21–M–E½ (Anal. T.S. Hunt) Ser. No. *1854–11*

Pale bluish or greenish grey with red spots. Lustre on the cleavage surfaces of the veins is vitreous.

T.S. Hunt (1857b, p. 379)

1093. **LABRADORITE.** From a coarse-grained diorite; lot 16, con. 3, North Sherbrooke tp., Lanark co., Ont.

31–C–E½ (Anal. G.C. Hoffmann) Ser. No. *1874–8*

White feldspar with vitreous lustre on cleavage surfaces, some of which display fine parallel striae. It is translucent except on weathered parts, where it becomes opaque white.

G.C. Hoffmann (1876, p. 315)

	1089	1090	1091	1092	1093
SiO_2	57.20	57.55	56.50	55.80	54.19
Al_2O_3	26.40	) 27.10	27.27	26.90	27.51
Fe_2O_3	0.40		0.45	1.53	0.45
FeO					
MgO			0.13	0.27	0.78
CaO	8.34	8.73	9.12	9.01	9.39
Na_2O	5.83	5.38	6.60	4.77	6.04
K_2O	0.84	0.79	0.23	0.86	1.40
H_2O+					) 1.12
H_2O-					
TiO_2			0.04		
P_2O_5					
MnO					
CO_2					
volatile	0.65	0.20		0.45	
Total	99.66	99.75	100.34	99.59	100.88
Sp.gr.	2.69			2.68	2.697

1094. **LABRADORITE.** Rawdon tp., Montcalm co., Que.

31–I–W½ (Anal. T.S. Hunt) Ser. No. *1854–10*

Bluish white, granular, homogeneous, often fine-grained labradorite with uneven sub-conchoidal fracture and a feebly vitreous lustre. Great masses are almost free from foreign minerals, whereas others abound in a green granular pyroxene.

T.S. Hunt (1857b, p. 380)

1095. **LABRADORITE.** From a grey gneiss; on one of the islands opposite the entrance of Partridge Bay, Georgian Bay, Lake Huron, Ont.

41–H–E½ (Anal. F.D. Adams) Ser. No. *1876–13*

The feldspar occurred in a nodule 5 inches in diameter and crusted with a layer ot white quartz.

R. Bell (1878, p. 197)

1096. **LABRADORITE.** From a boulder in Drummond tp., Lanark co., Ont.

31–C–E½ (Anal. T.S. Hunt) Ser. No. *1850–1*

A lavender-blue, cleavable feldspar with grey opalescence.

T,S. Hunt (1852a, p. 40)

1097. **LABRADORITE.** Lot 16, con. 3, North Sherbrooke tp., Lanark co., Ont.

31–C–E½ (Anal. G.C. Hoffmann) Ser. No. *1874–8*

Coarse-grained diorite containing small quantities of both a light and dark coloured mica but no quartz. Consists of dark olive-green hornblende and a translucent white feldspar, which becomes opaque-white on weathered surfaces. Lustre is vitreous on the cleavage surfaces, some of which display fine parallel striae.

G.C. Hoffmann (1876, p. 315)

1098. **FELDSPAR.** From the andesine anorthosite phase of a small boss that is on the margin of a belt of masses extending throughout Quebec; St. Urbain area, Charlevoix district, Que.

21–M–E½ (Anal. A.H. Phillips) Ser. No. *1922–6*

Contains some perthitic rods of orthoclase, which also occurs interstitially in the rock.

J.B. Mawdsley (1927, p. 25)

1099. **FELDSPAR.** From a peridotitic dolerite; Montarville, Chambly co., Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1858–11*

Occurs in yellowish vitreous grains along with augite, biotite, and occasionally olivine. It is rather broadly striated.

T.S. Hunt (1859, p. 184)

	1094	1095	1096	1097	1098	1099
SiO_2	54.45	53.86	54.70	54.19	53.56	53.10
Al_2O_3	28.05	27.73	29.80	27.51	29.86	26.80
Fe_2O_3	0.45	0.05	0.36	0.45	0.42	1.35
FeO						
MgO		trace	traces	0.78	0.16	0.72
CaO	9.68	11.77	11.42	9.39	11.30	11.48
Na_2O	6.25	6.97	2.44	6.04	4.60	4.24
K_2O	1.06		0.23	1.40	0.34	0.71
H_2O+				1.12		
H_2O-						
TiO_2					0.03	
P_2O_5						
MnO						
CO_2						
volatile	0.55		0.40			0.60
Total	100.49	100.38	99.35	100.88	100.27	99.00
Sp.gr.	2.69	2.68	2.697			2.73–2.74

1100. **FELDSPAR.** From the labradorite anorthosite phase of a small boss that is on the margin of a belt of masses extending through Quebec; St. Urbain area, Charlevoix district, Que.

21–M–E½ (Anal. A.H. Phillips) Ser. No. *1922–3*

Greyish mauve feldspar showing some schiller inclusions. Protoclastic structure is not well developed. Mineral grains are from 1 mm to 8 mm in diameter.

J.B. Mawdsley (1927, p. 25)

1101. **BYTOWNITE.** "Hole in the Rock", Tudor tp., Hastings co., Ont.

31–C–W½ (Anal. B.J. Harrington) Ser. No. *1874–4*

Pale greenish grey, mostly dull, here and there exhibiting crystalline faces, which have a vitreous lustre. Weathered surfaces are a pale rust, but this may be due to the oxidation of pyrite, small grains of which are scattered through the rock.

B.J. Harrington (1876, p. 310)

1102. **BYTOWNITE.** From a boulder near Ottawa, Carleton co., Ont.

31–G–W½ (Anal. T.S. Hunt) Ser. No. *1850–2*

A greenish white, massive, granular, strongly coherent feldspar with vitreous lustre approaching pearly on cleavage faces.

T.S. Hunt (1852a, p. 39)

1103. **ANORTHITE.** From intrusive diorite; Yamaska Mountain, Rouville co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1858–1*

In white crystals sometimes ½ inch long, beautifully striated, much penetrated by hornblende. Occurs with hornblende, sphene, small portions of mica, grains of pyrite, and a little disseminated carbonate of lime.

T.S. Hunt (1859, p. 179)

1104. **ORTHOCLASE.** From a porphyroid gneiss; Rivière Rouge, Argenteuil co., Que.

31–G–E½ (Anal. T.S. Hunt) Ser. No. 1858–20

Large cleavable masses of white, semi-transparent orthoclase occur in a fine-grained base of orthoclase, which also contains a little quartz, red garnet, and small quantities of silvery mica. The analysis is of the orthoclase phenocrysts.

T.S. Hunt (1859, p. 192) *See also* No. 1105 (*1858–25*)

1105. **ORTHOCLASE.** From a white porphyroid gneiss; Rivière Rouge, Argenteuil co., Que.

31–G–E½ (Anal. T.S. Hunt) Ser. No. *1858–25*

	1100	1101	1102	1103	1104
SiO_2	52.31	47.29	47.40	46.90	65.75
Al_2O_3	30.01	26.98	30.45	31.10	19.40
Fe_2O_3	0.61	3.11	0.80	1.35	
FeO		0.91			
MgO	0.07	0.66	0.87	0.65	
CaO	12.58	14.20	14.24	16.07	0.45
Na_2O	4.23	4.64	2.82	1.77	0.69
K_2O	0.32	0.06	0.38	0.58	13.60
H_2O+					
H_2O-		1.90			
TiO_2	0.04				
P_2O_5					
MnO					
CO_2					
volatile			2.00	1.00	0.25
Total	100.32 (100.17)	99.75	98.96	99.42	100.14
Sp.gr.		3.02	2.73	2.756–2.763	2.56

A fine-grained base of orthoclase occurring in gneiss, which also contains quartz, red garnet, small quantities and large cleavable masses of white, semi-transparent orthoclase. The analysis is of the fine-grained base.

T.S. Hunt (1859, p. 192) *See also* No. 1104 (*1858–20*)

1106. **ORTHOCLASE.** Lot 27, rge. 6, Buckingham tp., Papineau co., Que.

31–G–W½ (Anal. G.C. Hoffmann) Ser. No. *1876–18*

White, vitreous, translucent orthoclase is intimately associated with calcite and small quantities of an almost colourless, translucent quartz. It has two distinct cleavage planes meeting at an angle of 90° and has uneven fracture.

G.C. Hoffmann (1878, p. 511)

1107. **FELDSPAR.** From a granitoid quartzo-feldspathic rock; lot 27, rge. 6, Buckingham tp., Papineau co., Que.

31–G–W½ (Anal. G.C. Hoffmann) Ser. No. *1876–5*

Pale violet-grey, vitreous, subtransparent orthoclase is the main constituent of the rock, which is composed of small quantities of colourless translucent quartz and dark olive-green pyroxene, with a little clove-brown subtranslucent sphene, and an occasional crystal of fine red subtranslucent zircon.

G.C. Hoffmann (1878, p. 512)

	1105	1106	1107	1108 (a)	1108 (b)
SiO_2	70.10	64.14	63.46	66.23	65.40
Al_2O_3	16.40	18.62	18.78	18.77	18.80
Fe_2O_3		0.37	0.39	trace	trace
FeO					
MgO		0.07	0.22	nil	nil
CaO	1.42	0.74	1.28	0.31	nil
Na_2O	0.79	1.77	2.17	3.11	1.95
K_2O	10.96	14.87	13.92	12.09	13.90
H_2O+					
H_2O-					
TiO_2					
P_2O_5					
MnO		trace	trace		
CO_2					
volatile	0.40				
loss on ignition		0.41	0.47	nil	0.60
Total	100.07	100.99	100.69	100.51	100.65
Sp.gr.		2.5364	2.5780		

1108. **FELDSPAR.** Occurs in a vein cutting dark grey gneiss; Richardson mine, 7 miles east of Godfrey, Hunchinbrook tp., Frontenac co., Ont.

31–C–E½ (Anal. ?) Ser. No. *1911–1*

Mostly orthoclase, with occasional veins of plagioclase and some veins of later quartz. Occasional blotches of pyrite occur in the feldspar. Patches of tourmaline are found here and there. Two analyses, (a) and (b), were made.

H. Ries (1912a, p. 232)

1109. **ORTHOCLASE.** From a porphyritic trachyte of Chambly; Chambly co., Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1856–17*

The bountiful crystals of feldspar are more or less modified and terminated at both ends. They are easily detached from the rock and are yellowish and opaque on the exterior, but the interior parts of the larger ones are translucent and vitreous.

T.S. Hunt (1857c, p. 486)

1110. **ORTHOCLASE.** From trachyte; south side of Shefford Mountain, Shefford Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1858–21*

Yellowish, subtranslucent, pearly mineral disseminated through a completely crystalline fine-grained base with small portions of magnetite and yellow sphene and a little brilliant black hornblende. Two analyses, (a) and (b), were made.

T.S. Hunt (1859, p. 177)

	1109	1110 (a)	1110 (b)	1111	1112 (a)
SiO_2	66.15	65.15	66.15	63.25	61.10
Al_2O_3	19.75	20.55	19.75	22.12	20.10
Fe_2O_3					2.90
FeO					
MgO					0.79
CaO	0.95	0.73	0.95	0.56	3.65
Na_2O	5.19	6.67	5.19	6.29	5.93
K_2O	7.53	6.39	7.53	5.92	3.54
H_2O+					
H_2O-					
TiO_2					
P_2O_5					
MnO					
CO_2					
volatile	0.55	0.50	0.55	0.93	0.40
Total	100.12	99.99	100.12	99.07	98.41
Sp.gr.		2.561	2.561		2.563

1111. **FELDSPAR.** From compact trachyte; Mount Royal, Montreal Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1856–10*

T.S. Hunt (1857c, p. 488)

1112. **FELDSPAR.** From a granitoid micaceous trachyte; Yamaska Mountain, Rouville co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1858–13*

Occurs as brilliant yellowish or reddish grey grains of vitreous lustre. Triclinic, appearing to be a mixture of orthoclase and albite or some other triclinic feldspar. Resembles perthite. Two analyses, (a) and (b), were made of the rock.

T.S. Hunt (1859, p. 178)

1113. **CRYPTOPERTHITE.** Occurs in the nordmarkite of Brome Mountain, Brome and Shefford counties, Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1858–22*

Mottled in appearance and generally resembling orthoclase, but on closer examination proves to have a finely laminated perthitic intergrowth in spotted areas. These perthitic areas appear to be more numerous in proportion to the magnifying powers employed.

T.S. Hunt (1859, p. 176)

	1112 (b)	1113	1114	1115
SiO_2	58.60	65.70	66.44	54.60
Al_2O_3	21.60	20.80	18.35	22.17
Fe_2O_3	2.88		1.00	2.00
FeO				
MgO	1.84		0.24	1.30
CaO	5.40	0.84	0.67	4.62
Na_2O	5.51	6.52	5.56	4.46
K_2O	3.08	6.43	6.37	5.58
H_2O+		0.50		2.50
H_2O-				
TiO_2				0.60
P_2O_5				
MnO				
CO_2				
SrO				0.80
BaO				1.09
volatile	0.80		0.40	
Total	99.71	100.79	99.03	99.72
Sp.gr.	2.563	2.575	2.57–2.58	

1114. **PERTHITE.** From granite; Burgess tp., Lanark co., Ont.

31–C–E½ (Anal. T.S. Hunt) Ser. No. *1850–5*

Reddish with cleavage surfaces several inches broad which are barred with lighter and darker bands. These are flesh-red and reddish brown. The lustre is vitreous inclining to pearly, weathering darker. A second concordant analysis (partial) gave:
SiO_2 66.50%; Al_2O_3 and Fe_2O_3 19.25%; CaO 0.56%; K_2O 6.18%.

T.S. Hunt (1852a, p. 36)

1115. **RHOMBOFELDSPAR.** Occurs as phenocrvsts in a porphyry intrusive in oligocene sandstones and the conglomerates; where Rock Creek flows through a narrow steep-walled gorge just above its confluence with the Kettle River, Midway and Anarchist Mountain Plateau, B.C.

82–E–W½ (Anal. M.F. Connor) Ser. No. *1912–65*

The feldspar occurs in phenocrysts with augite, biotite, and a few small olivine crystals in a greenish grey, nearly or quite holocrystalline fine-grained rock abundantly charged with these phenocrysts. The feldspar is opaque and brownish due to inclusion of small augite, magnetite, and apatite crystals and granules. It is zoned with a core, resembling anorthite, an intermediate shell transitional between anorthoclase and orthoclase, and an outer shell of soda orthoclase, which is untwinned and glass clear.

R.A. Daly (1912, p. 403)

1116. **FELDSPAR.** Approximately 1 mile north of Waltham on the Ottawa River, Pontiac co., Que.

31–F–E½ (Anal. R.J.C. Fabry) Ser. No. *1938–1*

(H.V. Ellsworth) *See also* No. 1207 (*1938–12*)

1117. **SODALITE.** From a dyke cutting limestone at the Montreal reservoir extension; Montreal, Que.

31–H–W½ (Anal. B.J. Harrington) Ser. No. *1874–19*

Sodalite occurs with natrolite and analcite in small, irregular crystalline masses scattered through parts of the dyke and appears to have crystallized contemporaneously with feldspar and hornblende. It varies in colour from white to azure-blue. It is translucent to subtransparent and has a vitreous lustre, uneven fracture, and dodecahedral cleavage. The dyke is composed largely of feldspar and contains a good deal of hornblende and small quantities of iron pyrites.

B.J. Harrington (1876, p. 303)

1118. **SCAPOLITE.** From a boulder at Perth, Lanark co., Ont.

31–C–E½ (Anal. T.S. Hunt) Ser. No. *1852–7*

Associated with black mica; greenish grey, very tough, subtranslucent with a waxy lustre, and pearly upon the cleavage surfaces, which are very distinct in two directions at right angles.

T.S. Hunt (1854, p. 168)

1119. **SCAPOLITE.** Grenville Addition; lot 3, rge. 3, Harrington tp., Argenteuil co., Que.

31–G–E½ (Anal. R.J.C. Fabry) Ser. No. *1934–8*

Greenish grey.

(E. Poitevin)

1120. **SCAPOLITE.** Grenville Addition; north quarter of lot 18, rge. 2, Harrington tp., Argenteuil co., Que.

31–G–E½ (Anal. R.J.C. Fabry) Ser. No. *1934–6*

Greenish yellow.

(E. Poitevin)

	1116	1117	1118	1119	1120
SiO_2	59.62	37.52	46.30	44.16	44.20
Al_2O_3	21.98	31.38	26.20	29.91	28.87
Fe_2O_3	0.40	trace		1.21	0.96
FeO	0.15		0.60		
MgO	0.06	trace	3.63	0.40	0.18
CaO	0.68	0.35	12.88	18.89	21.52
Na_2O	2.39	19.12	4.30	2.17	2.03
K_2O	8.75	0.78	2.88	0.98	0.73
H_2O+	0.45			1.31	0.28
H_2O-	0.06				
TiO_2					
P_2O_5					
MnO					
CO_2				0.99	nil
Cl		6.91		trace	1.91
Na		4.48			
BaO	6.12				
volatile			2.80		
Total	100.66	100.54	99.59	100.12 (100.02)	100.68
Less O≡ Cl					0.43
					100.25
Sp.gr.		2.22	2.640–2.667		

1121. **SCAPOLITE.** Grenville Addition; lot 3, rge. 3, Harrington tp., Argenteuil co., Que.

31–G–E½ (Anal. R.J.C. Fabry) Ser. No. *1934–7*

Lemon yellow.

(E. Poitevin)

1122. **NATROLITE.** From a dyke cutting limestone at the Montreal reservoir extension; Montreal, Que.

31–H–W½ (Anal. B.J. Harrington) Ser. No. *1874–12*

Occurs in slender, almost acicular crystals often interlacing, and in groups of less perfect radiating crystals. It is colourless to white, and has a vitreous lustre, inclining to pearly in the radiating crystals. The dyke is composed largely of feldspar, and also contains hornblende and small quantities of iron pyrites.

B.J. Harrington (1876, p. 303)

1123. **HARMOTOME.** From a dark grey shale; Beaver mine, O'Connor tp., Thunder Bay district, Ont.

52–A–W½ (Anal. G.C. Hoffmann) Ser. No. *1890–3*

Occurs in small crystals implanted on prisms of calcite, resting on a layer of crystalline quartz coating the surface of a dark grey shale traversed by seams of similar quartz and purple fluorite. Pyrite occurs disseminated through the shale and attached to the layer of quartz upon which the calcite rests.

G.C. Hoffmann (1892, p. 16)

1124. **FAUJACITE.** Daisy Mica mine; lot 9, rge. 1, Derry tp., Papineau co., Que.

31–G–W½ (Anal. R.A.A. Johnston) Ser. No. *1900–11*

Occurs as simple octahedral crystals implanted upon the wall of small cavities in the quartz, or intimately associated with the fluorite in the matrix of the datolite. The crystals vary in size, are mostly milk-white, with in some instances a faint greenish tinge. They are opaque with a vitreous lustre and are occasionally colourless and translucent.

G.C. Hoffmann (1903, p. 13)

1125. **ZEOLITE.** Osoyoos mining district, Penticton, B.C.

82–E–W½ (Anal. R.J.C. Fabry) Ser. No. *1929–5*

(Unpublished data from Laboratory files)

1126. **ZEOLITE.** Osoyoos mining district, Penticton, B.C.

82–E–W½ (Anal. R.J.C. Fabry) Ser. No. *1929–2*

(Unpublished data from Laboratory files)

	1121	1122	1123	1124	1125[1]	1126
SiO_2	42.88	47.40	46.36	48.7	63.30	64.84
Al_2O_3............	29.58	26.38	17.16	17.0	11.94	12.38
Fe_2O_3	0.76				0.50	0.50
FeO						
MgO	0.36				0.39	0.04
CaO	22.11	0.48	2.25	4.6	9.54	7.14
Na_2O	1.33	16.48		3.2	3.28	3.67
K_2O	0.36	0.57			0.42	0.80
H_2O+	) 0.93		) 14.54	) 26.0	) 10.42	) 9.95
H_2O-		9.75				
TiO_2						nil
P_2O_5						
MnO						nil
CO_2	1.62					nil
Cl	1.04					
BaO			21.18		0.21	0.21
Total	100.97	101.06	101.49	99.5	100.00	99.53
Less O≡ Cl	0.23					
	100.74					
Sp.gr.		2.22	2.39	2.07		

[1]Analysis made on air-dried material

1127. **THUCHOLITE.** Consolidated Nicholson Mines Limited, Goldfields, Sask.

74–N–E½ (Anal. E.J. Brooker) Ser. No. *1955–12*

Occurs in nearly spherical masses much fractured radially as though from severe shrinkage in surface exposures. In the underground working it occurs in sooty form, apparently replacing pitchblende. It is associated with oxygen salts of uranium, nickel, cobalt, copper, and iron, and occurs in weathered, crumbly dolomite.

S.C. Robinson (1955, p. 69)

1128. **ANTHRAXOLITE.** Occurs in a quartz vein traversing limestone in the bituminous shales of the Cambrian system; Lake Hamilton River, Ungava district, Labrador.

23–J–E½ (Anal. G.C. Hoffmann) Ser. No. *1894–2*

Found in loose blocks scattered with broken shale. It has irregular structure with intermixed fragments and numerous small particles of white, translucent quartz, with thin films of ferric hydrate coating the walls of delicate fissures. It has a light brown ash, consisting mainly of silica.

G.C. Hoffmann (1896, p. 66)

1129. **NATURAL GAS.** A bore-hole 1,100 feet deep on Pender Island, Strait of Georgia, Victoria mining division, B.C.

92–B–W½ (Anal. D. McIntosh and F.M.G. Johns) Ser. No. *1915–30*

Nitrogen forms the principal constituent of the gas.

R.A.A. Johnston (1915, p. 168)

1130. **GREEN MINERAL.** From the line of traverse from the mouth of Qualicum River to Alberni, Vancouver Island, B.C.

92–F–E½ (Anal. B.J. Harrington) Ser. No. *1872–13*

Pale green mineral occurring in highly crystalline, fossiliferous limestone to which it appears to give the greenish tint. It weathers to a yellowish brown. It is not far removed from pyrophyllite in appearance and composition. The difference is in fusibility and mode of occurrence.

J. Richardson (1873, p. 83)

1131. **GREEN MINERAL.** Harvey, N.B.

21–G–E½ (Anal. B.J. Harrington) Ser. No. *1872–15*

Occurs in a coarse conglomerate in which angular fragments of fine red felsite and the green mineral are embedded in a feldspathic paste

	1127	1128	1129	1130	1131
SiO_2	0.18			66.54	66.84
Al_2O_3	} 0.11			16.02	19.66
Fe_2O_3					2.12
FeO				5.32[1]	
MgO	0.24			4.60	0.60
CaO	1.75			0.16	0.34
Na_2O					0.06
K_2O					3.54
H_2O		3.56			
CO_2			6.0		
N			94.0		
O			trace		
CoO	0.26				
NiO	0.58				
CuO	0.26				
PbO	0.32				
U_3O_8	0.28				
rare earth oxides	0.05				
loss on ignition	94.66	2.48		5.36	5.66
Fixed C		86.83			
ash		7.13			
R_2O_3 group insoluble	0.02				
Total	98.71	100.00	100.00	98.00	98.82

[1]Actual state of oxidation of the iron not specifically determined

containing large admixtures of similar greenish material. Mineral is leek-green with a dull lustre and in places is subresinous and resembles pyrophyllite.

B.J. Harrington (1873b, p. 300)

1132. **BLACK MINERAL.** Elizabethtown, lot 19, rge. 2, Leeds co., Ont.

31–B–W½ (Anal. G.C. Hoffmann) Ser. No. *1874–1*

Compact, amorphous, black, lustrous, earthy mineral with subconchoidal fracture. It occurs in large deposits of pyrite. Frequently it forms the gangue and is occasionally associated with a triclinic feldspar. It resembles hisingerite in appearance.

G.C. Hoffmann (1876, p. 315)

1133. **GREENISH GREY MINERAL.** Forming a small bed in limestone; North Elmsley, Lanark co., Ont.

31–C–E½ (Anal. T.S. Hunt) Ser. No. *1863–24*

With the limestone the mineral forms a granular mixture enclosing masses of the pure mineral, which closely resembles pyroxene in appearance. Prismatic cleavages are perfect, basal cleavages indistinct. It has resinous lustre and is brittle and somewhat translucent on the edges. Crystals of hard, unaltered, dark brown sphene and small masses of flesh-coloured calcite are embedded in it. It closely resembles loganite in character. Two specimens, (a) and (b), were analyzed.

Geological Survey (1863, p. 491)

	1132	1133 (a)	1133 (b)	1134 (a)	1134 (b)
SiO_2	29.07	36.90	36.50	39.70	38.90
Al_2O_3	12.12	11.13	10.80	14.20	14.30
Fe_2O_3	8.31				
FeO	30.78	9.18	9.54	4.50	4.32
MgO	7.28	28.11	28.26	25.84	25.62
CaO	0.36				
Na_2O					
K_2O					
H_2O+	10.73	) 14.00	) 14.62	) 16.20	) 17.66
H_2O-	1.64				
TiO_2					
P_2O_5					
MnO	0.10				
CO_2					
Total	100.39	99.32	99.72	100.44	100.80
Sp.gr.	2.990	2.538–2.539	2.538–2.539	2.32–2.35	2.32–2.35

1134. **GREYISH GREEN MINERAL.** North Burgess, Lanark co., Ont.

31–C–E½ (Anal. T.S. Hunt) Ser. No. *1863–23*

Occurs in a pyroxenic rock with large crystals of magnesium mica, and in embedded cleavable masses sometimes several inches in diameter. It has the cleavage of pyroxene with waxy lustre and translucent edges. It closely resembles loganite. Two analyses, (a) and (b), were made.

Geological Survey (1863, p. 491)

1135. **WILSONITE.** Lot 2, con. 9, Bathurst tp., Lanark co., Ont.

31–C–E½ (Anal. T.S. Hunt) Ser. No. *1852–9*

Massive, with cleavages that indicate an oblique system of crystallization. Vitreous lustre shining occasionally pearly on the cleavage surfaces. The colour is rose-red to peach blossom-red. Subtranslucent, with uneven fracture. Three analyses, (a), (b) and (c), were made.

T.S. Hunt (1854, p. 170)

1136. **WILSONITE.** Bathurst tp., Lanark co., Ont.

31–C–E½ (Anal. T.S. Hunt) Ser. No. *1863–46*

Associated with a white alumina pyroxene, together with calcite, mica, and prisms of blue apatite. Occurs as rose-red prismatic masses which

	1135 (a)	1135 (b)	1135 (c)	1136 (a)	1136 (b)
SiO_2	42.90	43.00	43.55	47.50	47.70
Al_2O_3	28.10[1] (Al_2O_3 + Fe_2O_3)	27.80	27.94	31.17	31.22
Fe_2O_3					
FeO		0.70[1]	0.20[1]		
MgO	3.99	3.83	3.81	4.25	4.14
CaO	6.94	6.72	6.50	1.51	0.39
Na_2O	0.95	0.95	1.45	0.82	0.95
K_2O	8.27	8.27	8.37	9.22	9.38
H_2O+ / H_2O-	9.00	9.40	8.61	5.50	5.35
TiO_2					
P_2O_5					
MnO					
CO_2					
Total	100.15	100.67	100.43	99.97	99.13
Sp.gr.				2.76–2.77	2.76–2.77

[1]Including MnO

have two parallel perfect cleavages, besides two distinct diagonal cleavages. The lustre is vitreous, shining somewhat pearly on cleavage surfaces, and thin fragments are translucent.
Two analyses, (a) and (b), were made.

Geological Survey (1863, p. 483)

1137. **PYRALLOLITE.** Charleston Lake, Grenville co., Ont.

31–B–W½ (Anal. T.S. Hunt) Ser. No. *1863–30*

Coarsely columnar, greenish white, sea-green or pearl-white, translucent mineral with a vitreous lustre on cleavage surfaces, and elsewhere waxy. It is sectile and unctuous like steatite.

Geological Survey (1863, p. 470)

1138. **URALITE.** Lot 23, rge. 13, Templeton tp., Papineau co., Que.

31–G–W½ (Anal. B.J. Harrington) Ser. No. *1877–24*

Crystals of pyroxene have been more or less converted into hornblende in the final stage. Alternative pyroxene is obliterated and the mineral consists of an aggregation of hornblende prisms.

B.J. Harrington (1879, p. 21) *See also* Nos. 993, 1139 (*1877–23, 25*)

1139. **ALTERED PYROXENE.** Lot 23, rge. 13, Templeton tp., Papineau co., Que.

31–G–W½ (Anal. B.J. Harrington) Ser. No. *1877–25*

Dull, pale greenish or greyish white material including acicular prisms of green hornblende which is the stage transitional in the alteration of pyroxene crystal to hornblende. The hornblende increases gradually in amount toward the last stage of alteration. The centre of the crystal consisted of glassy grey pyroxene.

B.J. Harrington (1879, p. 21) *See also* Nos. 993, 1138 (*1877–23, 24*)

1140. **ALTERED PYROXENE.** Glasgow Pit, Canadian Asbestos, Black Lake, Ireland tp., Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1930–1*

Occurs in flat brown needles mixed up with white alteration products.
(Unpublished data from Laboratory files)

1141. **TALCOSE ALTERATION PRODUCT.** Along a feldspathic dyke 5 or 6 feet thick, Bell Pit, Thetford Mines, Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1935–30*

The dyke is edged over a width of 1 inch to 2 inches with material of No. 986, beyond which there is an inch or two of the talcose material here analyzed, which contains narrow veins of asbestos. Beyond the talcose again lies the more normal serpentine.

(H.C. Cooke)

	1137	1138	1139	1140	1141
SiO_2	61.90	52.82	50.90	40.98	60.43
Al_2O_3		3.22	4.83	6.14	1.31
Fe_2O_3		2.07	1.74	15.14	nil
FeO	1.45	2.71	1.36	1.28	3.31
MgO	30.42	19.04	15.27	14.83	29.52
CaO		15.39	24.39	2.42	0.66
Na_2O		0.90	0.08	0.46	
K_2O		0.69	0.15	trace	
H_2O+	) 6.54			9.03	3.86
H_2O-				8.06	0.15
TiO_2				0.37	
P_2O_5					
MnO		0.28	0.15	0.43	0.04
CO_2				nil	nil
Cr_2O_3					0.23
loss on ignition		2.40	1.20		
Total	100.31	99.52	100.07	99.14	99.51
Sp.gr.	2.644	3.003	3.205		

1142. **EPSOMITE AND FIBROFERRITE.** Saline encrustation; occurs at the source of the small stream that issues from the base of high cliffs of limestone and flows into Canon branch of Elbow River, Alta.

82–J–E½ (Anal. R.A.A. Johnston) Ser. No. *1896–2*

Straw-yellow, very fine crystalline and massive.
Two analyses, (a) and (b), were made.

G.C. Hoffmann (1898, p. 13)

1143. **NEWBERYITE.** Struvite from the tusk of a mammoth; found at a depth of 15 feet, in the surface bed of dark, frozen, swamp muck of Quartz Creek, a tributary of Indian River, which flows into the Yukon some 20 miles south of Dawson City, Yukon Territory.

115–O–E½ (Anal. R.A.A. Johnston) Ser. No. *1899–19*

Occurred in the form of readily removable plates from 1 to 2 mm thick, which were at first colourless and transparent, but on exposure became white, and lost their transparency. They occurred in concentric rings of interglobular spaces in the ivory of the tusk.

G.C. Hoffmann (1901, p. 14)

1144. **BADDECKITE.** From a highly plastic clay about ½ mile from the town of Baddeck, Victoria co., N.S.

11–K–E½ (Anal. R.A.A. Johnston) Ser. No. *1896–1*

Occurred in the form of minute isolated scales. Small scaly aggregations and thin scaly layers are distributed through a highly plastic clay which also contains kaolinite, quartz, pyrite, and calcite. It is fine, copper-red, and has a pearly lustre with a tile-red streak.

G.C. Hoffmann (1898, p. 11)

1145. **HYDRONEPHELITE.** From the nepheline syenite of the Ice River complex; Ice River, Kootenay district, B.C.

82–N–E½ (Anal. R.A.A. Johnston) Ser. No. *1899–12*

White to pinkish, minute spherules having a radiated structure.

G.C. Hoffmann (1901, p. 13)

	1142 (a)	1142 (b)	1143	1144	1145
SiO_2	36.37	36.49		48.96	42.80
Al_2O_3	5.62	5.53		13.85	28.50
Fe_2O_3	13.12	13.18		25.82	0.34
FeO	0.94	0.91			
MgO		5.92	21.93	2.65	
CaO				1.17	1.90
Na_2O				0.22	14.33
K_2O				3.47	0.30
H_2O+ / H_2O-	) 37.06	) 36.92	) 37.18	) 3.78	) 10.81
TiO_2					
P_2O_5			38.53		
MnO					
CO_2			0.42		
NH_3			1.94		
insoluble	0.45	0.51			
Total	93.56	99.46	100.00	99.92	98.98
Sp.gr.					2.243–2.275

1146. **LIEVRITE.** From a boulder; in the vicinity of Ottawa, Ont.

31–G–W½ (Anal. T.S. Hunt) Ser. No. *1852–4*

Velvet-black with yellowish ash-grey powder, weathering rusty red. It is slightly translucent on the edges and strongly magnetic. It is brittle, with uneven fracture, and consists mainly of lievrite but also contains black mica and red garnet. Within, its lustre is sub-metallic, shining and sometimes iridescent.

T.S. Hunt (1854, p. 172)

1147. **SULPHIDE MINERALS.** Worthington Mines, lot 2, con. 2, Drury tp., Sudbury district, Ont.

41–I–W½ (Anal. W.F. Hillebrand) Ser. No. *1890–50*

White nickel ore occurs in the form of circular or oval patches, surrounded by the more common pyrrhotite or rock matter, and embedded in the pyrrhotite, chalcopyrite, and associated rock matter. It is probably a mixture and not a definite species.

E.D. Ingall (1893, p. 116)

1148. **PAROPHITE AGALMATOLITE.** St. Nicholas, Lotbinière co., Que.

21–L–W½ (Anal. T.S. Hunt) Ser. No. *1851–6*

(a) Occurs in schistose fragments with granular texture, fragile, pale greenish white, with waxy lustre, shiny, subtranslucent.
(b) Occurs in schistose fragments, pale yellowish green, translucent on the edges.
(c) Botryoidal with the appearance of concentric structure; olive-green, translucent with conchoidal fracture.

T.S. Hunt (1852b, p. 95)

1149. **AGALMATOLITE.** St. Francis, near Famine River, Beauce co., Que.

21–L–E½ (Anal. T.S. Hunt) Ser. No. *1863–1*

Forms a thin bed in clay slate. It is honey-yellow, translucent, granular with a waxy lustre, and is readily cut with a knife.

Geological Survey (1863, p. 485)

	1146	1147	1148 (a)	1148 (b)	1148 (c)	1149
SiO_2	27.80		48.50	48.42	49.13	50.50
Al_2O_3			27.50	27.60	27.80	33.40
Fe_2O_3	10.80					
FeO	56.52		5.67	4.50	5.90	traces
MgO	2.59	0.41	2.24	1.80	1.40	1.00
CaO	0.64	1.91	1.30	2.80	3.80	traces
Na_2O			1.91	2.78		0.63
K_2O			5.30	5.02		8.10
H_2O+						
H_2O-		0.55	7.00	6.88	6.30	5.36
MnO	trace					
S		45.11				
Mn		0.10				
Fe		38.36				
Ni		4.57				
H_2CO_3		1.49				
H_2SO_4		0.95				
volatile	1.20					
insoluble		4.80				
Total	99.55	98.25	99.42	99.80	94.33	98.99
Sp.gr.	4.15–4.16		2.705	2.703–2.714	2.784	

PARTIAL ANALYSES OF MINERALS

1150. **NATIVE PLATINUM.** From a sample of heavy black sand; in the sluice boxes at Camp McKinney, Rock Creek, Kettle River, Osoyoos division, Yale district, B.C.

82–E–E½ (Anal. R.A.A. Johnston) Ser. No. *1892–27*

Platinum occurs in the form of exceedingly minute to moderately coarse, irregular-shaped grains. The gold occurred in small very irregular shaped grains and the associated sand consisted of very fine grains of ash-grey quartz, with a few intermixed grains of a light reddish garnet, and an occasional grain of pyrite. A little chromite was detected in some of the pellets of platinum and very small quantities of white feldspathic rock were sometimes observed.
Platinum 44.7%; gold 1.8%; magnetite 47.4%; quartzose sand 6.1%.

G.C. Hoffmann (1895, p. 14)

1151. **GRAPHITE SPLIT ROCK.** Plumbago Mine at the Reversing Falls, Saint John River, N.B.

21–G–E½ (Anal. G.C. Hoffmann) Ser. No. *1878–5*

Greyish black, disseminated graphite with a loose shaly structure and readily parted into more or less lenticular fragments. The sample contained a rather large amount of pyrite evenly diffused through the graphitic rock.
Water 1.17%; graphitic carbon 48.78%; rock matter 50.06%.

G.C. Hoffmann (1880, p. 3)

1152. **GRAPHITE.** Associated with George River limestone in a bed 2 feet to 3 feet thick; half a mile south of Guthro Lake near the French Veil road, Cape Breton Island, N.S.

11–K–E½ (Anal. G.C. Hoffmann) Ser. No. *1879–5.*

The graphite occurs in the form of minute steel-grey scales of bright metallic lustre, very evenly disseminated through a graphitic shale. It leaves a reddish brown ash.

SiO_2 22.50%; Al_2O_3 14.36%; Fe_2O_3 5.13%; MgO 8.00%; CaO 1.80%; H_2O+ 3.55%; H_2O- 1.43%; FeS_2 0.41%; graphite 38.39%; Mn, Ni, Co, Cu, traces; alkalis not determined.

G.C. Hoffmann (1881, p. 2)

1153. **GRAPHITE.** Three quarters of a mile from the chapel on River Dennis Road, Inverness co., N.S.

11–F–W½ (Anal. R.A.A. Johnston) Ser. No. *1894–12*

A massive, earthy, graphitic material. Graphitic carbon 32.80%.

G.C. Hoffmann (1896, p. 67)

1154. **GRAPHITE.** Lot 23, rge. 6, Buckingham tp., Papineau co., Que.

31–G–W½ (Anal. G.C. Hoffmann) Ser. No. *1875–4*

More or less disconnected lenticular layers of a twisted fibrous graphite traverse a rock consisting of quartz and feldspar. The layers of graphite may be regarded as interstratified veins. The rock contains no calcite, but a small quantity of pyrrhotite.

H_2O 0.14%; graphite 30.52%; rock matter soluble in HCl 2.48%; rock matter insoluble in HCl 66.87%.

G.C. Hoffmann (1877, p. 428)

1155. **GRAPHITE.** Lot 28, rge. 6, Buckingham tp., Que.

31–G–W½ (Anal. G.C. Hoffmann) Ser. No. *1875–5*

Graphite occurs in scales disseminated closely and evenly through the rock so as almost to mask its nature entirely. The mineral contains some calcite and a small quantity of pyrrhotite or magnetite pyrites. H_2O 0.04%; graphite 27.52%; rock matter soluble in HCl, 17.54%; rock matter insoluble in HCl 54.90%.

G.C. Hoffmann (1877, p. 426)

1156. **GRAPHITE.** Lot 20, rge. 8, Buckingham tp., Papineau co., Que.

31–G–W½ (Anal. G.C. Hoffmann) Ser. No. *1875–2*

The graphite is evenly disseminated in scales through the rock, which contains some calcite and also some quantities of pyrrhotite.
H_2O 1.18%; graphite 23.80%; rock matter soluble in HCl 21.29%; rock matter insoluble in HCl 53.74%.

G.C. Hoffmann (1877, p. 428)

1157. **GRAPHITE.** Lot 22, rge. 6, Buckingham tp., Papineau co., Que.

31–G–W½ (Anal. G.C. Hoffmann) Ser. No. *1875–3*

Graphite occurs in disseminated scales evenly distributed through the rock, which was much decomposed and coloured brownish yellow to

reddish brown from the ferric hydrate present. The rock contains no calcite but a small quantity of pyrrhotite is present.
H_2O 1.74%; graphite 22.39%; rock matter soluble in HCl 19.47%; rock matter insoluble in HCl 56.41%.

G.C. Hoffmann (1877, p. 427)

1158. **GRAPHITE.** Glendale, River Inhabitants, Inverness co., N.S.

11–F–W½ (Anal. G.C. Hoffmann) Ser. No. *1878–6*

Graphite is very evenly disseminated through a bluish grey rock in the form of minute scales of steel-grey and metallic lustre. The lustre of fracture across the plane of deposition of the rock is dull, and that of fracture coincident with the lamination is sub-metallic and glistening.
H_2O 0.24%; graphite 13.97%; rock matter 85.80%.

G.C. Hoffmann (1880, p. 2)

1159. **ILMENITE.** Chateau Richer, Montmorency co., Que.

21–M–E½ (Anal. T.S. Hunt) Ser. No. *1854–4*

Occurs with hypersthene, feldspar, and quartz, generally near the hypersthene, but grains are occasionally in the crystalline feldspar, and it is interpenetrated with feldspar and quartz. It is iron-black, with sub-metallic lustre and is non-magnetic.
Al_2O_3, Fe_2O_3 and FeO 56.64%; MgO 1.44%; titanic acid 39.86%; insoluble (quartz, etc.), 4.90%.

T.S. Hunt (1857b, p. 376)

1160. **URANINITE-THUCHOLITE.** Wallingford Mine, lot 14, rge. 2, Derry tp., Papineau co., Que.

31–G–W½ (Anal. H.V. Ellsworth) Ser. No. *1932–52*

Thucholite occurs intimately associated with uraninite. It occurs intergrown with altered uraninite or possibly replacing it as cubes and octahedrons, which consist of crystals having a coating of lustrous thucholite next to the matrix with altered uraninite inside. They occur in the microcline, quartz, or plagioclase of a large pegmatite dyke.
SiO_2 3.46%; Fe_2O_3, Al_2O_3 and BeO 2.55%; CaO 0.93%; PbO 9.88%; U_3O_8 68.92%; ThO_2 6.76%; $(Ce, La, Di)_2O_3$ 0.66%; $(Yt, Er)_2O_3$ 4.04%.

H.V. Ellsworth (1932, p. 246, 270)

1161. **PYROCHLORE.** Molybdenum Corporation property, Oka region, Two Mountains co., Que.

31–G–E½ (Anal. Mines Branch) Ser. No. *1958–1*

Pyrochlore is the most important niobium mineral in the Oka complex. It occurs in grains and crystals up to 5 mm in size, in soda-pyroxene biotite-calcite rocks, particularly near bodies of microijolite or biotitized micro-ijolite. On smooth surfaces of the diamond drill core it is generally reddish brown but on rock surfaces it is usually chocolate brown. It is brownish red to reddish brown in thin sections. Grains and crystals are generally unzoned, but a few zoned crystals were noted. Inclusions of calcite, apatite, and biotite are common. Biotite near pyrochlore is usually bright orange-red and in general it is more or less radioactive. FeO 2.3%; CaO 17.1%; Na_2O 2.5%; TiO_2 7.7%; rare earth oxides 9.0%; U_3O_8 0.3%; ThO_2 1.8%; Nb_2O_5 49.4%; loss on ignition 2.1%.

R.B. Rowe (1958, p. 78)

1162. **MANGANO-COLUMBITE-TANTALITE.** Pegmatite and aplite dykes, which are genetically related to, and cut in all directions, muscovite granite; Lacorne tp., Abitibi co., Que.

32–C–W½ (Anal. H.V. Ellsworth) Ser. No. *1950–16*

Occurs commonly in tiny wedge-like grains in albite, more rarely in quartz and spodumene, scattered uniformly in very small amounts in the spodumene- or beryl-bearing pegmatite and aplite dykes.
TiO_2 2.5%; $(Cb, Ta)_2O_5$ 85.00%. Analyzed microchemically.

L.P. Tremblay (1950, p. 47)

1163. **CALCITE.** Second age of carbonate in crosscutting quartz carbonate veins; Negus Mine, Campbell system, Yellowknife, District of Mackenzie.

85–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1952–11*

FeO 0.43%; MgO 2.6%; CaO 55.20%; MnO 0.75%.

R.W. Boyle (1961, p. 147)

1164. **CALCITE.** Third age of carbonate in late fractures; Rycon mine, Negus-Rycon system, Negus Mine, Yellowknife, District of Mackenzie.

85–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1952–10*

Calcite scalenohedra.

FeO 0.46%; MgO 0.45%; CaO 54.91%; MnO 0.89%;

R.W. Boyle (1961, p. 147)

1165. **CALCITE.** Second age of carbonate in crosscutting quartz-carbonate veins; Negus Mine, Campbell system, Yellowknife, District of Mackenzie.

85–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1952–12*

FeO 0.72%; MgO 0.69%; CaO 53.85%; MnO 0.83%.

R.W. Boyle (1961, p. 147)

1166. **MAGNESITE.** Sample across 26 feet of good magnesite; 1½ miles south-southwest and nearly 1,000 feet higher than No. 1171; Difficulty Hill, Cranbrook area, B.C.

82–F–E½ (Anal. R.J.C. Fabry) Ser. No. *1932–19*

SiO_2 9.78%; Al_2O_3 and Fe_2O_3 2.19%; MgO 39.83%; CaO 1.10%; insoluble 3.96%.

(H.M.A. Rice)

1167. **MAGNESITE.** Taken across 12 feet of magnesite, including considerable quartzite, in limy layers; 1½ miles south-southwest and nearly 1,000 feet higher elevation than No. 1171; Difficulty Hill, Cranbrook area, B.C.

82–F–E½ (Anal. R.J.C. Fabry) Ser. No. *1932–18*

SiO_2 8.74%; Al_2O_3 and Fe_2O_3 2.59%; MgO 38.71%; CaO 1.46%; insoluble 5.02%.

(H.M.A. Rice)

1168. **MAGNESITE.** Representing a width of 18 feet; 1½ miles south-southwest and nearly 1,000 feet higher elevation than No. 1171; Difficulty Hill, Cranbrook area, B.C.

82–F–E½ (Anal. R.J.C. Fabry) Ser. No. *1932–16*

SiO_2 2.92%; Al_2O_3 and Fe_2O_3 2.80%; MgO 40.66%; CaO 0.46%; Insoluble 2.80%.

(H.M.A. Rice)

1169. **MAGNESITE.** At the extreme headwaters of the north fork of Moyie River, Consolidated Mining and Smelting Company property, Perry Creek, B.C.

82–F–E½ (Anal. R.J.C. Fabry) Ser. No. *1932–11*

Varies from coarse to finely crystalline, and is commonly thinly coated rusty brown. Fresh surfaces are pearly grey, white, and cream. In some places it is traversed by veinlets of quartz.

SiO_2 5.92%; Al_2O_3 and Fe_2O_3 5.11%; MgO 42.09%; CaO 1.79%; insoluble 2.39%.

C.E. Cairnes (1933, p. 103)

1170. **MAGNESITE.** Old Town Formation; south of St. Mary River, Marysville, B.C.

82–F–E½ (Anal. R.J.C. Fabry) Ser. No. *1932–12*

Crystalline rock magnesite containing quartz, serpentine, and sapphire. The showing is about 50 feet wide, of which the western part seems relatively pure and the eastern part is impure with numerous thin inter-beds of greenish shaly material.

SiO_2 5.41%; Al_2O_3 and Fe_2O_3 2.21%; MgO 42.34%; CaO 4.24%; insoluble 2.54%.

(C.E. Cairnes)

1171. **MAGNESITE.** Difficulty Hill, Cranbrook, B.C.

82–F–E½ (Anal. R.J.C. Fabry) Ser. No. *1932–15*

A member about 123 to 150 feet wide. Above the sample stratigraphic width is a wide zone of impure, more or less banded, magnesite.
SiO_2 3.73%; Al_2O_3 and Fe_2O_3 2.32%; MgO 43.66%; CaO 1.13%; insoluble 2.51%.

(C.E. Cairnes)

1172. **MAGNESITE.** Sample across a width of 20 feet containing a few narrow shale bands; ½ mile south-southwest and nearly 1,000 feet higher elevation than No. 1171; Difficulty Hill, Cranbrook area, B.C.

82–F–E½ (Anal. R.J.C. Fabry) Ser. No. *1932–17*

SiO_2 8.61%; Al_2O_3 and Fe_2O_3 3.00%; MgO 44.85%; CaO 0.84%; insoluble 1.35%.

(H.M.A. Rice)

1173. **SIDERITE.** Keno Hill, Mayo area, Yukon Territory.

105–M–W½ (Anal. R.J.C. Fabry) Ser. No. *1949–1*

Fe_2O_3 10.54%; FeO 29.84%; MgO 0.58%; CaO 0.28%; MnO 22.6%; insoluble 0.30%.

(H.S. Bostock)

1174. **RHODOCHROSITE.** In a vein crossing the much altered, fine-grained sediments and volcanic rocks of the Echo Bay Group; Eldorado Mine, LaBine Point, northwest of Cape of Echo Bay, Great Bear Lake, District of Mackenzie.

86–K–W½ (Anal ?) Ser. No. *1936–16*

Occurs with quartz and dolomite as the principal gangue minerals of veins in several fracture and shear zones.
MgO 5.00%; CaO 0.97%; MnO 38.74%; CO_2 38.3%; Fe 9.13%.

D.F. Kidd (1936, p. 36)

1175. **ANKERITE.** Early alteration carbonate, Giant-Campbell system; Yellowknife, District of Mackenzie.

85–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1952–8*

FeO 3.27%; MgO 18.43%; CaO 30.44%; MnO 0.42%.

R.W. Boyle (1961, p. 147)

1176. **ANKERITE.** Typical material of ankerite veins cutting crinoidal limestone near the southern limit of the large ankerite body; Monarch Mountain, Atlin map-area, B.C.

104–N–W½ (Anal. R.J.C. Fabry) Ser. No. *1953–1*

Grey rusty weathering material with a brecciated appearance and containing fragments of quartz. The carbonate grains are easily visible. SiO_2 21.51%; FeO 3.74%; MgO 7.76%; CaO 23.55%; MnO 0.06%; CO_2 31.10%.

(J.D. Aitken)

1177. **ANKERITE.** Dolomite in a vein crossing much altered fine-grained sediments and volcanic rocks of the Echo Bay Group; Eldorado Mine, LaBine Point, northwest of Cape of Echo Bay, Great Bear Lake, District of Mackenzie.

86–K–E½ (Anal. ?) Ser. No. *1936–15*

With quartz and ferruginous rhodochrosite it makes up the principal gangue minerals of the veins of several fracture and shear zones.
MgO 18.53%; CaO 28.53%; CO_2 44.50%; Fe 3.12%; Mn 0.52%; BaO 0.01%; Cu 0.28%.

D.F. Kidd (1936, p. 36)

1178. **ANKERITE.** Second age of carbonate in crosscutting quartz carbonate veins; Negus mine, Campbell system, Yellowknife, District of Mackenzie.

85–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1952–9*

FeO 6.41%; MgO 11.65%; CaO 28.05%; MnO 0.21%.

R.W. Boyle (1961, p. 147)

1179. **ANKERITE.** Early carbonate veinlets cutting early alteration carbonates; Giant-Campbell system, Vee-Vee Lake, Yellowknife, District of Mackenzie.

85–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1952–7*

FeO 7.37%; MgO 15.48%; CaO 28.57%; MnO 0.56%.

R.W. Boyle (1961, p. 147)

1180. **CARBONATE.** In lens-shaped bodies lying in close proximity to the post-Pennsylvanian fault marking the south face of the Cobequid Mountains, 900 feet east of Pine Brook, Colchester co., N.S.

11–E–W½ (Anal. Bureau of Mines, Ottawa) Ser. No. *1948–12*

Primary carbonate bodies are a series of roughly parallel lenses whose boundaries in detail are exceedingly irregular. The carbonate crystal grain varies from sugary with about ½ mm size to coarsely crystalline. They form ore when they have undergone oxide enrichment by surface waters.
MgO 12.02%; CaO 29.10%; CO_2 41.80%; insoluble 1.74%; Fe 10.77%.

L.J. Weeks (1948, p. 52)

1181. **CARBONATE.** From parallel lenses lying in close proximity to the post-Pennsylvanian fault marking the south face of the Cobequid Mountains from the crest of the high bank of Pine Brook, Colchester co., N.S.

11–E–W½ (Anal. Bureau of Mines, Ottawa) Ser. No. *1948–11*

Description same as No. 1180.

MgO 12.01%; CaO 27.99%; CO_2 41.74%; insoluble 4.50%; Fe 10.05%.

L.J. Weeks (1948, p. 52)

1182. **CARBONATE.** From parallel lenses lying in close proximity to the post-Pennsylvanian fault marking the south face of Cobequid Mountains from the open-cut, 1,000 feet east of Pine Brook, Colchester co., N.S.

11–E–W½ (Anal. Bureau of Mines, Ottawa) Ser. No. *1948–14*

Description same as No. 1180.

MgO 11.01%; CaO 30.21%; CO_2 41.88%; insoluble 0.16%; Fe 12.72%.

L.J. Weeks (1948, p. 52)

1183. **CARBONATE.** From parallel lenses lying in close proximity to the post-Pennsylvanian fault marking the south face of Cobequid Mountains from the open-cut, 1,000 feet east of Pine Brook, Colchester co., N.S.

11–E–W½ (Anal. Bureau of Mines, Ottawa) Ser. No. *1948–13*

Description same as No. 1180.

MgO 9.03%; CaO 22.46%; CO_2 40.84%; insoluble 1.94%; Fe 13.33%; Mn high.

L.J. Weeks (1948, p. 52)

1184. **CARBONATE.** From parallel lenses lying in close proximity to the post-Pennsylvanian fault marking the south face of Cobequid Mountains from the north side of the open-cut, Peter Totten Meadow, Colchester co., N.S.

11–E–W½ (Anal. Bureau of Mines, Ottawa) Ser. No. *1948–17*

Description same as No. 1180.

MgO 9.80%; CaO 29.00%; CO_2 39.14%; insoluble 0.39%; Fe 13.75%.

L.J. Weeks (1948, p. 52)

1185. **HYDROMAGNESITE.** West of the road to Campbell Range, about 13 miles southeast of Kamloops, B.C.

92–I–E½ (Anal. ?) Ser. No. *1942–9*

Irregular deposit.

MgO 37.44%; CaO 0.66%; Fe and Al group 0.93%; insoluble in HCl 7.37%; loss on ignition not determined.

(W.E. Cockfield)

1186. **HYDROMAGNESITE.** A deposit about ¼ mile long and 200 to 400 feet wide; east of Buce Lake, about ¼ mile south of Bernon Road, and about 17 miles east of Kamloops, B.C.

92–I–E½ (Anal. ?) Ser. No. *1942–8*

MgO 34.20%; CaO 1.76%; H_2O 6.56%; MnO 0.07%; SO_3 0.05%; loss on ignition 38.45%; Fe and Al group 3.91%; insoluble in HCl (including any silicate) 20.74%.

(W.E. Cockfield)

1187. **HYDROMAGNESITE.** Deposit, 6 feet deep, in a depression or dry lake; on the road to Campbell Range, about 2 miles east of Barnhart Vale, 12 miles east of Kamloops, B.C.

92–I–E½ (Anal. ?) Ser. No. *1942–7*

MgO 27.44%; CaO 5.71%; MnO 2.05%; Fe and Al group 3.56%; insoluble in HCl (silica) 23.28%; loss on ignition not determined.

(W.E. Cockfield)

1188. **GYPSUM.** Hillsboro, Albert co., N.B.

21–H–E½ (Anal. A.A. Breneman) Ser. No. *1897–5*

The deposits are varied in character. Some are snow-white, some are exceedingly fine grained, and some coarse and soft. Irregular veins of discoloured gypsum of all shades of red, grey, and blue-grey are intermixed. Occasionally seams of red marl-like stone fill the spaces in the latter. Underlying these pure beds are masses of anhydrite.
SiO_2 0.25%; Fe_2O_3 trace; MgO trace; CaO 32.45%; H_2O 21.05%; H_2SO_4 46.38%.

L.W. Bailey (1898, p. 89, 97)

1189. **GYPSUM.** Northwest of Knutsford on a bench 150 feet above the road, B.C.

92–I–E½ (Anal. ?) Ser. No. *1942–6*

Gypsum occurs in a deposit 4 to 8 feet thick. It is greyish cream, apparently due to the presence of organic matter.
Al_2O_3 and Fe_2O_3 0.06%; MgO trace; CaO 31.0%; SO_3 42.1%; insoluble 4.5%; ignition loss 21.6%.

(W.E. Cockfield)

1190. **AMBLYGONITE.** Moose pegmatite dyke; Beaulieu River area north side of Hearne Channel, east arm of Great Slave Lake, District of Mackenzie.
85–I–E½ (Anal. R.J.C. Fabry) Ser. No. *1944–10*

The dyke, up to 200 feet wide, cuts across nodular greywacke and pinches out at both ends. It is one of the largest lithium deposits in Canada. The minerals identified in the dyke include microcline, cleavelandite, quartz,

muscovite, spodumene, amblygonite, graphite, beryl, tantalite-columbite, cassiterite, tourmaline, and lazulite. The largest crystal faces of amblygonite were 2 feet by 3 feet.
Li_2O 4.68%.

A.W. Jolliffe (1944, p. 23)

1191. **CARNOTITE.** Occurs in small fissures in the rocks of the copper deposits of Quadra Island; Gowland Harbour, Vancouver Island, B.C.

92–K–W½ (Anal. Mines Branch) Ser. No. *1932–43*

Soft greenish yellow material occurring in small fissures.
SiO_2 10.6%; Fe_2O_3 and FeO 2.9%; H_2O 4.9%; uranium oxide 28.9%; V_2O_5 21.1%.

H.V. Ellsworth (1932, p. 139)

1192. **TOURMALINE.** Madoc, Hastings co., Ont.

31–C–W½ (Anal. T.S. Hunt) Ser. No. *1863–44*

Black tourmaline, forming veins an inch or more wide, found in white quartz, and made up of very fine fibres. Traversed to the sides of the vein. Velvet-black, with a silky lustre resembling masses of charcoal.
SiO_2 36.50%; Al_2O_3 27.45%; Fe_2O_3 14.90%; MgO 6.05%; CaO 1.12%.

Geological Survey (1863, p. 493)

1193. **SPODUMENE.** From the central part of a white pegmatite body 10 miles northeast of Point du Bois, near the north side of lot 17, rge. 16, tp. 16, Man.

52–L–W½ (Anal. M.F. Connor) Ser. No. *1924–10*

White or greyish white spodumene occurs in cleavable masses, which fracture unevenly in a pegmatite consisting principally of white alkali feldspar, spodumene, montebrasite, and a few small pockets of lepidolite.
Al_2O_3 18.13%; Fe_2O_3 0.07%; Na_2O 0.28%; K_2O 0.11%; F 0.16%; Li_2O 4.76%; H_2PO_4 1.25%.

J.F. Wright (1926, p. 103)

1194. **SPODUMENE.** From the Moose dyke of pegmatite, 200 feet wide cutting across nodular greywacke; Beaulieu River area, north side of Hearne Channel, east arm of Great Slave Lake, District of Mackenzie.

85–I–E½ (Anal. R.J.C. Fabry) Ser. No. *1944–9*

Spodumene occurs with microcline, cleavelandite, quartz, muscovite, spodumene, amblygonite, graphite, beryl, tantalite, columbite, cassiterite, tourmaline, and lazulite. Bands up to 50 feet long and 5 feet wide sometimes carry more than 25% spodumene, the largest crystals of which were 2 feet by 4 feet.
Li_2O 3.65%.

A.W. Jolliffe (1944, p. 23)

1195. **TALC.** Massive, 100-foot thickness underlying an albitic dyke through which the gold shafts pass; at the Pioneer extensions workings on Cadwallader Creek, Bridge River, B.C.

92–J–E½ (Anal. R.J.C. Fabry) Ser. No. *1936–2*

Within the talc body are large and small nodular masses of Fergusson sediments consisting of thinly interbedded chert and argillite. The borders of these nodular inclusions appear to show gradations to talc. Probably the talc body has resulted from the transformation of such material.
SiO_2 58.40%; Al_2O_3 and Fe_2O_3 (mostly Fe_2O_3) 8.07%; MgO 29.66%.

C.E. Cairnes (1937, p. 71)

1196. **STEATITE.** Among altered Silurian strata; lot 16, rge. 5, Potton tp., Brome co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1856–32*

Greenish white, translucent, and occurs in slaty masses.
SiO_2 59.50%; Al_2O_3 0.40%; FeO 4.50%; MgO 29.15%; volatile 4.40%; NiO traces.

T.S. Hunt (1857c, p. 446)

1197. **TALC.** Elzivir tp., Hastings co., Ont.

31–C–W½ (Anal. T.S. Hunt) Ser. No. *1863–42*

Soft flaky talc separated from greyish steatite or soapstone found in Laurentian rocks.
SiO_2 59.10%; FeO (with traces of Mn) 3.51%; MgO 29.05%; volatile 5.56%.

Geological Survey (1863, p. 469)

1198. **LEPIDOLITE.** From the central body of white pegmatite; near the north side of lot 17, rge. 16, tp. 16, 10 miles northeast of Point du Bois, Man.

52–L–W½ (Anal. M.F. Connor) Ser. No. *1924–9*

Two lenses or masses of lepidolite occur in the south side of the central body of pegmatite, which consists principally of white alkali feldspar, spodumene, and montebrasite. The lepidolite occurs as small flakes less than ¼ inch in diameter, some white, others with lilac tints.
Al_2O_3 26.63%; Fe_2O_3 0.10%; Na_2O 1.80%; K_2O 0.62%; F 4.10%; Li_2O 3.87%; H_3PO_4 traces.

J.F. Wright (1926, p. 103)

1199. **KAOLIN.** Occurs in a fracture zone 1,000 feet wide that traverses a belt of Grenville quartzite; St. Remi, Amherst tp., Labelle co., Que.

31–G–E½ (Anal. A.G. Spencer) Ser. No. *1919–20*

The kaolin occurs in narrow leads as matrix between broken fragments of quartzite or as a replacement. It is coloured in various shades of red,

brown and yellow from the presence of disseminated hydrous iron oxide with fine flakes of muscovite, aggregates of tourmaline, and disseminated flakes and aggregates of graphite present.
SiO_2 54.24%; Al_2O_3 34.24%; Fe_2O_3 and FeO 2.4%; MgO 0.46%; CaO 2.54%; loss on ignition 5.87%.

M.E. Wilson (1919, p. 24)

1200. **SERPENTINE.** Occurs in thin layers in fine-grained greenish grey greenstone; near the copper mine in Upton, Yamaska co., Que.
31–H–E½ (Anal. T.S. Hunt) Ser. No. *1863–8*
Soft, greenish, amorphous, translucent substance resembling serpentine. Pale green residue from acetic acid.
SiO_2 51.80%; Al_2O_3 11.30%; FeO 13.14%; MgO 7.80%; CaO 3.25%; K_2O, Na_2O, not determined; water 4.40%.

Geological Survey (1863, p. 604)

1201. **ORTHOCLASE.** From veins of graphite; lot 22, rge. 7, Buckingham tp., Papineau co., Que.
31–G–W½ (Anal. G.C. Hoffmann) Ser. No. *1876–19*
Orthoclase is the principal gangue of the greater number of graphite veins and is associated with a small quantity of colourless translucent quartz. It is pearl-grey, subtransparent, with vitreous lustre, uneven fracture and two distinct cleavage planes.
SiO_2 63.69%; Na_2O 3.11%; K_2O 12.75%.
Specific gravity 2.5796.

G.C. Hoffmann (1878, p. 511)

1202. **ORTHOCLASE.** In or with Laurentian limestone; Chatham, Argenteuil co., Que.
31–G–E½ (Anal. T.S. Hunt) Ser. No. *1863–26*
Associated with dark green pyroxene, brown sphene, and quartz, in beds of a coarse-grained rock.
SiO_2 65.20%; Al_2O_3 18.30%; CaO 0.34%; Na_2O 1.75%; K_2O 8.57%.
Specific gravity 2.55 to 2.57.
Geological Survey (1863, p. 475)

1203. **FELDSPAR.** From a peridotic dolerite; at the east end of Mount Royal, Montreal, Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1858–10*

White granular feldspar constitutes about half the rock mass and includes crystals of brilliant black augite and others of semi-transparent, amber-yellow olivine.
SiO_2 53.60%; Al_2O_3 25.40%; Fe_2O_3 4.60%; MgO 0.86%; CaO 8.62%; volatile 0.80%; Na_2O and K_2O 6.12%.

T.S. Hunt (1859, p. 185)

1204. **FELDSPAR.** From a boulder; Hunterstown, Maskinongé co., Que.

31–I–W½ (Anal. T.S. Hunt) Ser. No. *1854–7*

A large cleavable mass of feldspar, translucent, and pale green.
SiO_2 49.10%; Al_2O_3 26.80%; Fe_2O_3 0.80%; MgO traces; CaO 14.67%; Na_2O and K_2O 7.33%; loss by ignition 1.30%.
Specific gravity 2.695 – 2.703.

T.S. Hunt (1857b, p. 381)

1205. **LABRADORITE.** Morrin, Terrebonne co., Que.

31–H–W½ (Anal. T.S. Hunt) Ser. No. *1852–3*

Bluish, opalescent, cleavable feldspar associated with grains of magnetic iron and greenish amorphous material.
SiO_2 54.20%; Al_2O_3 29.10%; Fe_2O_3 1.10%; MgO 0.15%; CaO 11.25%; volatile 0.40%; Na_2O and K_2O undetermined.
Specific gravity 2.684 – 2.695.

T.S. Hunt (1854, p. 167)

1206. **ALBITE.** Templeton tp., Papineau co., Que.

31–G–W½ (Anal. B.J. Harrington) Ser. No. *1877–1*

Albite crystals form drusy linings in cavities or crevasses in apatite, sphene, and pyroxene.
Na_2O 8.96%; K_2O 2.75%.

B.J. Harrington (1879, p. 30)

1207. **FELDSPAR.** Approximately 1 mile northwest of Waltham, Pontiac co., Que.

31–F–E½ (Anal. R.J.C. Fabry) Ser. No. *1938–12*

A series of samples of feldspar were analyzed for barium content. For complete analysis of a sample from the same locality see No. 1116, Ser. No. *1938–1*.

Sample Nos:	1	2	3	4	5	6	7	8	9	10	11	12
BaO %	7.13	6.99	5.96	5.66	6.06	5.66	5.66	5.16	3.20	3.31	6.84	6.96

(H.V. Ellsworth)

1208. **AMBER.** From the west side of Cedar Lake a short distance south of Saskatchewan River, Man.

63–F–E½ (Anal. B.J. Harrington) Ser. No. *1890–42*

Light coloured fragments free from black carbonaceous matter. The substance occurs in small irregular-shaped pieces. The colour varies from pale yellow to dark brown. Many, under transmitted light, were

clouded or banded from the presence of dark carbonaceous matter. They were superficially dull with fresh surfaces resinous. Fracture was conchoidal.
C 79.96%; H 10.46%; O_2 9.49%; ash 0.09%.
Specific gravity 1.005 at 20° centigrade.

J.B. Tyrrell (1892, p. 226)

1209. **THUCHOLITE.** In a large pegmatite dyke; Wallingford mine, lot 14, rge. 2, Derry tp., Papineau co., Que.

31–G–W½ (Anal. H.V. Ellsworth) Ser. No. *1932–51*

Thucholite occurs in various forms in microcline, quartz, or plagioclase. Much is powdery and dead looking but some retains its original brilliant, black lustre. It is most often in rounded grains, but also occurs intergrown with altered uraninite, or possibly replacing the latter as cubes and octahedrons. These crystals have a coating of lustrous thucholite next to the matrix with altered uraninite inside. Freshly ignited ash gave when analyzed:
SiO_2 6.40%; Al_2O_3 and Fe_2O_3 4.30%; CaO 15.70%; U_3O_8 18.20%; ThO_2 10.40%; $(Ce, La, Di)_2O_3$ 22.80%; $(Yt, Er)_2O_3$ 12.80%.
The composition of the thucholite is approximately H_2O 13.33%, gases 28.70%, ash 19.84%, fixed carbon 37.93%. Heavy hydrocarbons were not detected.

H.V. Ellsworth (1932, p. 266)

1210. **ANTHRAXOLITE.** Considerable vein in shale; on the south side of the Island of Orleans, opposite Quebec City, St. Lawrence River, Que.

21–L–W½ (Anal. ?) Ser. No. *1915–29*

Volatile 21.0%.

R.A.A. Johnston (1915, p. 24)

1211. **OOLITIC CHAMOSITE.** Forms a 3-inch layer above the top of the Scotia Bed; location 215 D6, zone 4, Wabana Iron Ore Formation, Bell Island, Nfld.

1–N–E½ (Anal. A.O. Hayes) Ser. No. *1915–66*

Grey oolitic chamosite is marked from the red hematite below by a sharp colour line. The chamosite occurs as nodules and as a replacement of shell fragments. Siderite surrounds the nodules and sometimes replaces them.

SiO_2 16.22%; Al_2O_3 7.65%; Fe_2O_3 2.99%; FeO 35.38%; MgO 1.84%; CaO 4.01%; H_2O+ 2.61%; H_2O- 0.78%; TiO_2 0.61%; P_2O_5 4.91%; MnO 3.12%; CO_2 16.64%.
Specific gravity 3.50.

A.O. Hayes (1915, p. 53)

1212. **GREEN IRON SILICATE.** Piedmont Iron Ore, Colchester co., N.S.

11–E–W½ (Anal. H.A. Leverin) Ser. No. *1916–12*

Occurs with hexagonal plates of hematite scattered in irregular masses throughout a bed of ferruginous material.
SiO_2 42.42%; Fe 16.30%; P 2.84%.

A.O. Hayes (1917, p. 277)

1213. **AGALMATOLITE.** Forms a belt 150 feet wide; lot 1, rge. 1, Stanstead tp., on the east shore of Lake Memphremagog, Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1863–2*

A thin layer of pure agalmatolite has a banded structure and a ligneous aspect with a shiny satiny lustre. It is translucent, amber-yellow, or wax-coloured, and resembles steatite.
SiO_2 50.30%; Al_2O_3 32.60%; FeO trace; MgO 1.20%; H_2O 6.50%; alkalies undetermined.

Geological Survey (1863, p. 485)

ANALYSES OF ORES

1214. **IRON ORE.** At or near the contact of the Carboniferous conglomerate and Precambrian felsites; Gairloch Mountain, Middle River, Cape Breton Island, N.S.

11–K–E½ (Anal. G.C. Hoffmann) Ser. No. *1879–10*

Micaceous ore coated with a thin layer of purplish red hematite.

G.C. Hoffmann (1881, p. 14)

1215. **IRON ORE.** Cook's Brook, Acadia Mines, N.S.

11–E–W½ (Anal. G.C. Hoffmann) Ser. No. *1872–12*

Specular ore, which occurs in small crystals or scales of a steel-grey colour. It has a surface coating of hydrated peroxide of iron. Insoluble residue consisted of:
SiO_2 1.20%; Al_2O_3 0.07%.

B.J. Harrington (1873a, p. 31)

1216. **SPECULAR ORE.** East River, Pictou co., N.S.

11–E–E½ (Anal. T.E. Thorpe) Ser. No. *1873–16*

B.J. Harrington (1874b, p. 226)

1217. **SPECULAR ORE.** East River, Pictou co., N.S.

11–E–E½ (Anal. S. MacAdam) Ser. No. *1873–17*

B.J. Harrington (1874b, p. 227)

1218. **HEMATITE.** Near Big Pond, East Bay, Bras d'Or Lake, Cape Breton Island, N.S.

11–F–E½ (Anal. H. How) Ser. No. *1874–5*

A deposit of ochreous-red hematite apparently of great extent.

C. Robb (1876, p. 263)

1219. **IRON ORE.** From the 11-foot bed, Whykokomagh, at the southern extremity of St. Patrick's channel, Bras d'Or Lake, Inverness co., N.S.

11–F–W½ (Anal. Prof. Noad) Ser. No. *1875–6*

Beds are 10 to 12 feet thick and consist of brown hematite, sometimes pure, but for the most part more or less mixed with quartz.

G.C. Hoffmann (1877, p. 415) *See also* Nos. 1226, 1228 (*1875–6*)

1220. **HEMATITE.** Big Pond, East Pond, Bras d'Or Lake, Cape Breton Island, N.S.

11–F–E½ (Anal. Prof. Noad) Ser. No. *1875–7*

A deposit of ochreous-red hematite apparently of great extent.

H. Fletcher (1877, p. 415)

1221. **HEMATITE.** McNab tp., Renfrew co., Ont.

31–F–E½ (Anal. T.S. Hunt) Ser. No. *1869–2*

A purplish red, compact, finely crystalline ore, holding small quantities of siliceous matter and irregularly disseminated calcite.

T.S. Hunt (1870, p. 259)

1222. **HEMATITE.** From a bed resting upon crystalline limestone and limited on the south by compact grey limestone; lot 6, between cons. C and D, McNab tp., Madawaska River, Renfrew co., Ont.

31–F–E½ (Anal. T.S. Hunt) Ser. No. *1845–3*

	1214	1215	1216	1217	1218
SiO_2			3.20	3.68	0.26
Al_2O_3		0.33		0.21	trace
Fe_2O_3	97.56	96.93	96.63	92.01	88.21
FeO			0.89		
MgO		0.11		0.20	1.22
CaO		0.04		0.71	
H_2O+		0.79			) 1.53
H_2O-	0.02	0.03			
MnO		trace		2.16	
S			0.06[1]	0.16	trace
P					trace
H_2CO_3				0.79	
H_3PO_4		0.01		0.08	
H_2SO_4		nil			
titanic acid				trace	
siliceous gangue					8.78
insoluble	1.23	1.26			
Total	98.81	99.50	100.78	100.00	100.00
Sp.gr.		5.93			

[1] Pyrites

The ore presents a red, earthy, exterior aspect. Fresh fractures are purplish red and exhibit an aggregation of minute shiny scales. It contains patches of quartz and calcite.

T.S. Hunt (1847, pp. 78, 123)

1223. **HEMATITE.** From a contact deposit at the head of Loch Lomond, ¼ mile southwest of L'Ardoise Road, and ¼ mile southwest of McVicars Road, Cape Breton co., N.S.

11–F–E½ (Anal. F.D. Adams) Ser. No. *1880–1*

Compact, steel-grey material, which is red in part.

G.C. Hoffmann (1883, p. 7)

	1219	1220	1221	1222	1223
SiO_2		14.0		4.00	
Fe_2O_3	85.70	85.6	84.42	84.10	83.65
FeO					7.64
MgO	2.40				
H_2O-	2.00			3.10	0.34
MnO	0.20				0.29
S	nil		0.07		0.08
P			0.03		0.03
insoluble	6.09		7.16		7.77
$MgCO_3$			1.05		
$CaCO_3$			5.40	8.80	
H_3PO_4	3.56	trace			0.08
H_2SO_4					0.19
Total	99.86 (99.95)	99.6	99.13 (98.13)	100.00	100.07

1224. **IRON ORE.** East half of lot 1, con. 4, Dalhousie tp., Lanark co., Ont.

31–C–W½ (Anal. G. Broome) Ser. No. *1871–1*

H.G. Vennor (1872, p. 123)

1225. **HEMATITE.** Lot 14, rge. 11, Beckwith tp., Lanark co., Ont.

31–F–E½ (Anal. G.C. Hoffmann) Ser. No. *1888–9*

Dark greyish, reddish brown material, in part coated a purplish to brownish red. Unctuous powder. It has an uneven, minutely crystalline fracture and contains a little calcite and other minerals disseminated through it.

G.C. Hoffmann (1890, p. 21)

1226. **IRON ORE.** From the 11-foot bed, Whykokomagh, at the southern extremity of St. Patrick's channel, Bras d'Or Lake, Inverness co., N.S.

11–F–W½ (Anal. Prof. Noad) Ser. No. *1875–6*

Beds are 10 to 12 feet thick and consist of brown hematite, sometimes pure, but for the most part more or less mixed with quartz.

G.C. Hoffmann (1877, p. 415) *See also* Nos. 1219, 1228 (*1875–6*)

1227. **SPECULAR IRON.** Occurs in veins included in a light greenish, drab, granular quartzite, which they traverse in the most irregular manner; west side of the east branch of the East River, about 3½ miles above Springhill, Pictou co., N.S.

11–E–E½ (Anal. G. Broome) Ser. No. *1869–8*

The iron seems to exist over a considerable area, and some portions are pure.

E. Hartley (1870, p. 439)

1228. **IRON ORE.** From the 11-foot bed, Whykokomagh, at the southern extremity of St. Patrick's channel, Bras d'Or Lake, Inverness co., N.S.

11–F–W½ (Anal. Prof. Noad) Ser. No. *1875–6*

Beds are 10 to 12 feet thick and consist of brown hematite, sometimes pure, but for the most part more or less mixed with quartz.

G.C. Hoffmann (1877, p. 415) *See also* Nos. 1219, 1226 (*1875–6*)

	1224	1225	1226	1227	1228
SiO_2		13.85		32.50	
Al_2O_3		0.91			
Fe_2O_3	82.25	81.67	74.30	65.14	52.40
FeO			6.70		
MgO		0.05	2.75		3.32
CaO	trace	1.49			
Na_2O		0.07			
K_2O		0.02			
H_2O+		0.67			
H_2O-	0.66	0.33		0.91	
TiO_2		nil			
MnO		0.08	0.40		nil
S		0.01	nil		nil
P	0.03	0.11			
H_2CO_3		0.65			
H_3PO_4		0.25	1.00		1.50
H_2SO_4		0.03			
insoluble	16.05		14.80		42.80
Total	98.99	100.19	99.95	98.50 (98.55)	100.02
Sp.gr.				4.607	

1229. **LIMONITE.** In a vein 18 feet thick, with one wall of solid slate and the other of stiff red and white clay; Fraser Saddler area, East River, Pictou co., N.S.

11–E–E½ (Anal. B.J. Harrington) Ser. No. *1873–23*

Beautiful fibrous limonite of light brown colour containing but little sulphur and manganese, although heavy spar, manganite, and pyrolusite are found occasionally associated in parts of the vein. Two feet eight inches of the vein consists of loose concretionary limonite and the rest is a solid variety.
Insoluble residue consisted of:
SiO_2 1.98%; Al_2O_3 and traces of Fe_2O_3 0.18%; CaO traces.

B.J. Harrington (1874b, p. 233)

1230. **LIMONITE.** Eight-foot thick mass overlain by close-grained sandstone and granular quartzite; at the east side of the east branch of East River, near Springhill, Pictou co., N.S.

11–E–E½ (Anal. G. Broome) Ser. No. *1869–11*

Pure limonite of the mammillary stalactitic and fibrous varieties. It appears to be conformable to the stratification of the overlying sandstone.

E. Hartley (1870, p. 441)

1231. **LIMONITE.** Ross mine, Londonderry, Acadia Mines, N.S.

11–E–W½ (Anal. G.C. Hoffmann) Ser. No. *1872–10*

Occurs mostly in the form of lustrous botryoidal or mammillary and stalactitic masses of a dark brown colour. It exhibits a fibrous structure when broken. Insoluble residue consisted of:
SiO_2 2.54%; Al_2O_3 and traces of Fe peroxide 0.09%.

B.J. Harrington (1873a, p. 30)

1232. **LIMONITE.** From the north vein at Cumberland Brook, Acadia Mines, N.S.

11–E–W½ (Anal. B.J. Harrington) Ser. No. *1873–21*

Hard compact dark brown ore, without lustre except upon the surfaces of occasional cavities, which are interspersed through it.

B.J. Harrington (1873a, p. 29)

1233. **LIMONITE.** Martin's Brook, Acadia Mines, N.S.

11–E–W½ (Anal. G.C. Hoffmann) Ser. No. *1872–11*

Dark brown. Occurs in lustrous botryoidal masses exhibiting a fibrous structure when broken. Insoluble residue consisted of:
SiO_2 4.51%; Al_2O_3 and Fe_2O_3 0.28%.

B.J. Harrington (1873a, p. 30)

	1229	1230	1231	1232	1233
SiO_2				1.93	
Al_2O_3	0.69		0.23	0.66	0.56
Fe_2O_3	85.01	84.94	84.73	82.13	82.65
FeO	nil		trace	1.00	trace
MgO	0.19		0.14	0.25	0.10
CaO	0.49		0.14	0.88	0.15
H_2O+	10.77	15.43	11.07	11.07	10.51
H_2O-	0.36	0.92	0.33	0.44	0.31
MnO	0.38		0.23	0.72	0.25
S			trace		
P			0.08		
H_3PO_4	trace		0.19	0.86	0.38
H_2SO_4	0.06		0.01	0.04	0.02
organic	trace				
insoluble	2.14	0.41	2.67		4.79
Total	100.09	101.70	99.82	99.98	99.72
Sp.gr.	3.84		3.98	3.77	3.91

1234. **LIMONITE.** South vein, Cumberland Brook, Acadia Mines, N.S.

11–E–W½ (Anal. B.J. Harrington) Ser. No. *1872–8*

Yellowish brown, earthy and rather friable limonite containing a large amount of manganese.

B.J. Harrington (1873a, p. 29)

1235. **LIMONITE.** West branch of the East River, Pictou co., N.S.

11–E–E½ (Anal. G.C. Hoffmann) Ser. No. *1873–22*

Compact brown dark limonite.

B.J. Harrington (1874b, p. 234)

1236. **LIMONITE.** St. Maurice, Champlain district, Que.

31–I–E½ (Anal. T.S. Hunt) Ser. No. *1852–5*

(a) Bright reddish brown externally with a brilliant black fracture.
(b) 'Rotten Ore' containing a large amount of water and volatile organic matter.
(c) Dark coloured, evidently manganesian limonite, more like bog iron ore.

T.S. Hunt (1854, p. 175)

1237. **IRON ORE.** From a vein that goes eastward for ¼ mile; along the slope of the hill on the north side of a small swampy brook, which is a tributary of Totten's Brook, Londonderry, Colchester co., N.S.

11–E–W½ (Anal. B. J. Harrington) Ser. No. *1872–1*

B.J. Harrington (1873a, p. 22)

	1234	1235	1236 (a)	1236 (b)	1236 (c)
SiO_2	3.05	5.84	5.40	3.60	4.80
Al_2O_3	0.63	1.02			
Fe_2O_3	79.68	76.93	77.60	74.30	64.80
FeO		4.97			
MgO	0.34	0.05			
CaO	0.57	0.31			
H_2O+	11.65	9.29			
H_2O-	0.78	0.18			
MnO	2.51	0.07	0.30[1]	trace[1]	5.50[1]
H_3PO_4	0.44	0.99	1.81	1.80	1.25
H_2SO_4	0.01	0.11			
loss on ignition			17.25	22.20	23.65
organic		0.18			
Total	99.66	99.94	102.36	101.90	100.00
Sp.gr.	3.31–3.43	3.955			

[1]Exact formula questionable for values given in originals as "sesquioxyd of Mn"

1238. **BOG IRON ORE.** Upper rocky point; lot 21, rge. 8, Eardley tp., Hull co., Que.

31–F–E½ (Anal. T.S. Hunt) Ser. No. *1845–2*

Bog iron ore is deposited on clay overlying sand and arenaceous limestone. It is in honeycomb nodules, not continuously touching one another, with a little soil above them.

T.S. Hunt (1847, pp. 79, 124)

1239. **BOG IRON ORE.** St. Angelique, Vaudreuil co., Que.

31–G–E½ (Anal. B.J. Harrington) Ser. No. *1873–12*

Black or brownish black concretionary ore, with concretions averaging probably not more than ¾ inch in diameter and usually free from intermixed sand.

B.J. Harrington (1874b, p. 236)

1240. **MAGNETITE.** Airy tp., Nipissing district, Que.

31–E–E½ (Anal. F.G. Wait) Ser. No. *1895–18*

Compact masses of magnetite.

G.C. Hoffmann (1897, p. 19)

1241. **MAGNETITE.** Lot 29 or 30, con. 1, Bedford tp., Frontenac co., Ont.

31–C–E½ (Anal. Prof. Chapman) Ser. No. *1873–24*

B.J. Harrington (1874b, p. 211)

	1237	1238	1239	1240	1241
SiO_2		21.60			
Al_2O_3		1.60			0.67
Fe_2O_3...........	78.52[1]	57.15	40.96	64.81	59.39
FeO.............				31.57	26.93
MgO.............			trace		0.82
CaO.............			1.48		0.33
H_2O.............		18.85	17.97[2]		
MnO.............			26.34		trace
S				0.27	0.07
P				nil	trace
titanic acid[3]......					3.23
insoluble			12.08	1.66	8.38
$MgCO_3$	0.87				
$CaCO_3$	20.61				
H_3PO_4			0.60		
H_2SO_4...........			trace		
Total	100.00	99.20	99.43	98.31	99.82

[1] Hydrated
[2] Including organic matter
[3] As given in original

1242. **MAGNETITE ORE.** North shore of West Redonda Island, Gulf of Georgia, B.C.

92–K–E½ (Anal. F.G. Wait) Ser. No. *1892–22*

Greyish black, highly magnetic, somewhat fine-crystalline granular massive magnetite.

G.C. Hoffmann (1895, p. 35)

1243. **MAGNETIC IRON ORE.** Cherry Bluff, Kamloops Lake, B.C.

92–I–E½ (Anal. B.J. Harrington) Ser. No. *1877–14*

Bluish black, showing in places a curious subcolumnar structure. The only gangue visible was some quartz and calcite.

B.J. Harrington (1879, p. 46)

1244. **IRON ORE.** Hull, Hull co., Que.

31–G–W½ (Anal. T.S. Hunt) Ser. No. *1869–6*

Magnetic ore, red, coloured by an admixture of hematite and associated with graphite.

T.S. Hunt (1870, p. 254)

1245. **MAGNETIC IRON ORE.** Forming a series of beds interstratified with red syenitic gneiss and glistening micaceous and hornblendic schist; lots 21 and 22, rge. 2, Bristol, Pontiac co., Que.

31–F–E½ (Anal. B.J. Harrington) Ser. No. *1873–13*

Finely granular, dark steel-grey, containing scattered nests of pyrite and disseminated grains of quartz and calcite. It is a mixture of crystalline magnetite and hematite with a streak ranging in colour from reddish to blackish.

B.J. Harrington (1874b, p. 208)

1246. **IRON ORE.** Occurs in beds separated by bands of chloritic shale near a band of serpentine; lot 7, rge. 5, Leeds tp., Megantic co., Que.

21–L–W½ (Anal. B.J. Harrington) Ser. No. *1873–9*

Iron-black or reddish, fine-grained magnetite, more or less mixed with micaceous iron ore. Acid-insoluble portion consisted of:
SiO_2 2.42%; Al_2O_3 0.27%; CaO 0.01%; MgO 0.01%; K_2O 0.08%.

B.J. Harrington (1874b, p. 209)

	1242	1243	1244	1245	1246
SiO_2	4.35		10.44	11.45	0.01
Al_2O_3	0.22			0.60	0.71
Fe_2O_3	62.95	64.85	66.20	65.44	80.76
FeO	28.07	27.57	17.78	14.50	13.59
MgO	1.30	0.78	0.45[1]	0.45	0.45
CaO	2.23	1.26	0.76[1]	3.90	1.30
Na_2O	0.23				
K_2O	0.08				
H_2O+	0.05	0.37		0.14	0.17
H_2O-					0.05
MnO	0.11	0.09		0.11	
CO_2			2.66[2]		0.056
S	0.02		0.28		
P			0.02		
FeS_2				2.74	
H_2CO_3		0.33		1.64	
H_3PO_4	nil	0.23		trace	0.47
H_2SO_4		0.07			0.10
titanic acid	nil				nil
graphite			0.71		
organic					0.04
insoluble		4.07			2.75
Total	99.61	99.62	99.30	100.97	100.45
Sp.gr.				4.32	5.041

[1] As silicate
[2] As calcium carbonate

1247. **SPATHIC IRON ORE.** Pictou co., N.S.

11–E–E½ (Anal. T.E. Thorpe) Ser. No. *1873–15*

Highly crystalline, grey or brownish grey material somewhat nodular in structure, altering to a darker colour on exposure. Some of it is a good deal mixed with limestone. The junction with the overlying and underlying rocks has an undulating character.

B.J. Harrington (1874b, p. 239)

1248. **SPATHIC IRON ORE.** Sutherland River, Pictou co., N.S.

11–E–E½ (Anal. S. MacAdam) Ser. No. *1873–14*

Highly crystalline, grey or brownish grey material somewhat nodular in structure, altering to a darker colour on exposure. Some of it is much mixed with limestone. The junction with the overlying and underlying rocks has an undulating character.

B.J. Harrington (1874b, p. 239)

1249. **SPATHOSE ORE.** South bank of Sutherland Brook, Pictou co., N.S.

11–E–E½ (Anal. G. Broome) Ser. No. *1869–13*

The peculiar deposit of iron ore included in Indian-red and greenish drab sandstones appears to be a mixture of spathic iron and red hematite, with little impurity.

Analyses:

(a) is of a specimen from the outcrop of Sutherland Brook.

(b) is of a specimen from a costean pit about 75 feet farther westward.

E. Hartley (1870, p. 442)

	1247	1248	1249 (a)	1249 (b)	1250
SiO_2	2.70	1.51	3.76	2.38	
Fe_2O_3			16.98	20.52	
H_2O-			0.76	1.43	
S	0.55		nil		
P			0.01		
C (organic)			trace	nil	
insoluble					10.94
$FeCO_3$	88.59	88.48	65.61	57.40	52.70
$MgCO_3$	3.48	5.82	3.23	5.66	11.81
$CaCO_3$	1.53	2.34	2.67	4.02	trace
$MnCO_3$	2.85	1.85	7.98	8.29	24.64
Total	99.70	100.00	101.00	99.70	100.09
Sp.gr.				3.49	3.49

1250. **SPATHIC IRON ORE.** From the 'iron formation' of the upper part of the sedimentary series that forms the chain of Nastapoka Islands; Flint Island, Hudson Bay.

34–C–E½ (Anal. B.J. Harrington) Ser. No. *1877–16*

Dark brown to black, very compact material containing considerable manganese.

B.J. Harrington (1879, p. 47)

	1251 (a)	1251 (b)	1252	1253	1254
SiO_2			12.53	0.07	5.63
Al_2O_3	trace	trace		trace	2.00
Fe_2O_3	87.21	83.21		69.86	67.86
FeO					1.07
MgO	0.45	0.65	0.52	0.42	2.94
CaO	trace	trace	2.78	11.70	0.89
Na_2O					0.63
K_2O					0.74
H_2O+	8.01	10.18		5.74	
H_2O-				1.33	
TiO_2			5.74		
P			0.10		
MnO				2.25	0.98
Mn_3O_4	1.67	1.83			
S			trace		
Fe (metallic)			55.50		
H_2CO_3				9.20	5.61[1]
H_3PO_4	trace	trace			0.06
H_2SO_4				0.04	0.59
insoluble	2.71	3.73			
Total	100.05	99.60	[2]	100.61	100.00 (89.00)
Sp.gr.				3.29	

[1] Including water

[2] Total unobtainable because iron given as metallic iron only

1251. **IRON ORE.** Londonderry iron ore deposit, Colchester co., N.S.

11–E–W½ (Anal. ?) Ser. No. *1916–4*

(a) Red and (b) brown iron ores occur as decomposition products of carbonates of iron.

A.O. Hayes (1917, p. 264)

1252. **IRON ORE.** Deposit consisting of a number of beds of indurated black magnetic sand, probably in the form of an ancient shore concentration; about 1 mile north of Burmis, 9 miles east of Blairmore, Alta.

82–G–E½ (Anal. Mines Branch) Ser. No. *1911–3*

The ore consisted of more or less surrounded particles of magnetite, quartz, and augite, with a little secondary calcite apparently derived from plagioclase. The whole is cemented by iron oxide.

W.W. Leach (1912, p. 200)

1253. **IRON ORE.** Peter Totten Lot, Acadia Mines, N.S.

11–E–W½ (Anal. B.J. Harrington) Ser. No. *1872–9*

B.J. Harrington (1873a, p. 30)

1254. **IRON ORE.** Carleton co., N.B.

21–J–W½ (Anal. ?) Ser. No. *1907–11*

The ores of iron comprise magnetite, hematite, specular ore, limonite, or bog iron. They are all found at widely separated points and are sometimes of good quality.

R.W. Ells (1907, p. 83) *See also* Nos. 1255, 1256 *(1907–10, 12)*

1255. **IRON ORE.** Carleton co., N.B.

21–J–W½ (Anal. ?) Ser. No. *1907–10*

The ores of iron comprise magnetite, hematite, specular ore, and limonite. They are found at widely separated points and sometimes are of good quality. Two analyses, (a) and (b), are given.

R.W. Ells (1907, p. 83) *See also* Nos. 1254, 1256 (*1907–11*, *12*)

1256. **IRON ORE.** Carleton co., N.B.

21–J–W½ (Anal. ?) Ser. No. *1907–12*

The ore comprises magnetite, hematite, specular iron ore, and limonite. They are found at widely separated points and sometimes are of good quality.

R.W. Ells (1907, p. 83) *See also* Nos. 1254, 1255 (*1907–10, 11*)

1257. **ILMENITE.** Mass in syenitic rock; Baie St. Paul, St. Urbain parish, Chicoutimi co., Que.

21–M–E½ (Anal. T.S. Hunt) Ser. No. *1849–1*

The ore is massive, often coarsely granular with black colour and streak and metallic lustre. The ilmenite contains in many parts orange-red transparent grains of pure rutile, and sometimes it is penetrated by grains of a green triclinic feldspar, which forms the surrounding anorthosites.

T.S. Hunt (1850b, p. 105)

1258. **ILMENITE.** Baie St. Paul, St. Urbain parish, Chicoutimi co., Que.

21–M–E½ (Anal. F. Penny) Ser. No. *1873–8*

Occurs in a rock made up of triclinic feldspar. Frequently it contains grains of red-orange transparent titanic acid.

B.J. Harrington (1874b, p. 227)

1259. **PYRITE.** Deposit consisting of two lenses of massive pyrite between volcanic greenschist and light grey schistose to massive sericitic schist; pyrite deposit near Hawk Junction, tp. 28, rge. 25, Michipicoten district, Lake Superior, Ont.

42–C–E½ (Anal. H.A. McKenty) Ser. No. *1926–10*

The pyrite is massive and brilliant and is traversed by veinlets of brighter and coarser grained pyrite.

W.H. Collins, T.T. Quirke, and E. Thomson (1926, pp. 114, 124)

	1255 (a)	1255 (b)	1256	1257	1258	1259[1]
SiO_2	19.84	16.84	34.21		1.91	
Al_2O_3	6.11	3.92	10.74		4.00	
Fe_2O_3	50.00	47.86	27.14		20.35	
FeO	2.40	2.14	trace	46.44	29.57	
MgO	4.07	5.02	2.06	3.60	3.17	
CaO	1.15	1.00	5.96		1.00	
Na_2O	0.22	0.67	0.77			
K_2O	0.21	0.97	0.88			
TiO_2				48.60		
MnO	3.74	6.11	5.17			
S						46.31
P						trace
Mn						0.16
Fe						43.03
As						nil
H_2CO_3 & H_2O	10.63	13.89	10.29			
H_3PO_4	1.06	0.98	1.92			
H_2SO_4	0.57	0.60	0.84			
titanic acid					40.00	
insoluble						9.71
Total	100.00	100.00	99.98	98.64	100.00	99.21

[1] Magnetic portion = 3.00%

1260. **MANGANESE ORE.** From a narrow vein cutting sediments of the Sibley Series; on the northwest quarter of lot 3, McTavish tp., Thunder Bay district, Ont.

52–A–E½ (Anal. R.J.C. Fabry) Ser. No. *1931–14*

Very high grade ore, consisting almost entirely of massive and finely crystalline black manganese mineral identified as braunite and psilomelane. Locally in the vein there are small crystalline aggregates of barite and minor amounts of quartz.

T.L. Tanton (1932, pp. 102–103)

1261. **CHROMITE.** In a serpentinite dunite; old Greenshields chrome pit, on the west slope at a 1,000-foot elevation, Provincial Hill, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. M.F. Connor) Ser. No. *1930–37*

The chromite is translucent red, but there are appreciable quantities of black oxidized chromite along joints and cracks. Olivine is present as inclusions. Lattice mesh and colloidal serpentine without magnetite occur as gangue. A few veinlets of chrysotile asbestos are visible and some brucite and magnetite grains are present.

E. Poitevin (1931, p. 19)

1262. **CHROMITE.** Deposit in a rock originally wholly olivine now 55% antigorite serpentine; from a pit on the south slope near the summit of Caribou Mountain, Ireland tp., Megantic co., Que.

21–L–W½ (Anal. M.F. Connor) Ser. No. *1930–39*

The chromite is translucent and red-brown. It is much fractured and the fractures are filled with antigorite serpentine. The matrix was originally olivine, and any fresh and altered olivine inclusions are scattered through the massive chromite. No magnetite or picotite is visible.

E. Poitevin (1931, p. 19)

1263. **CHROMITE.** From a dunite now 60% antigorite; Woolsey's Pit on the west slope of a 1,540-foot elevation, Quarry Hill, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. M.F. Connor) Ser. No. *1930–35*

The chromite is red and translucent with a little black oxidized chromite along fissures. The gangue is lattice-mesh serpentine. The mesh serpentine is somewhat colloidal. There are a few olivine inclusions but no magnetite is visible.

E. Poitevin (1931, p. 19)

1264. **CHROMITE.** From a dunite now 75% antigorite serpentine; Bennett-Martin Claim, lot 27, rge. 1 of the road to Vimy, Ireland tp., Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1931–5*

The material consists largely of nodular chromite, the interstices being occupied by dunite as gangue. The rest of the constituents are residual olivine and a little magnetite, due to serpentinization. Chromite is reddish and semitranslucent with minute idiomorphic crystals of picotite in it.

The olivine of the dunite has been transformed to antigorite, and a few pyroxenes originally present are now bastite. The chromite is somewhat fractured and the fractures are filled with antigorite bearing showers of ultramicroscopic crystals of magnetite, close to the walls of the fractures. The chromite along the edge of the fractures is generally darker than elsewhere, as the result of oxidation.

E. Poitevin (1931, p. 19)

	1260	1261	1262	1263	1264
SiO_2	7.04	0.40	0.53	0.50	0.91
Al_2O_3	0.14	12.61	14.32	14.36	12.03
Fe_2O_3	0.70	3.68	0.44	0.59	6.82
FeO		12.92	14.95	17.51	8.59
MgO	0.14	13.66	12.27	10.45	16.46
CaO	1.48	0.40	0.70	0.60	0.28
Na_2O	0.64				
K_2O	0.48				
H_2O+	2.00				) 0.64
H_2O-	0.48				
TiO_2	nil	0.15	trace	0.15	0.08
P_2O_5	0.36				
MnO	44.22	0.16	0.12	0.20	trace
Mn_2O_3	41.65				
S	0.40				
BaO	0.42				
Cr_2O_3		56.81	56.30	56.00	55.95
NiO		0.15	0.20	0.14	0.06
Total	100.15	100.94	99.83	100.50	101.82
Less O≡ S	0.17				
	99.98				

1265. **CHROMPICOTITE.** On Scottie Creek, a stream flowing into the Bonaparte River east of Mundorff, Lillooet district, B.C.

92–I–W½ (Anal. R.A.A. Johnston) Ser. No. *1900–2*

A massive, fine to somewhat coarse granular, black, opaque, brittle mineral with sub-metallic lustre and uneven fracture. It is non-magnetic with the greyish streak inclining to blackish brown. In thin sections it is translucent, and brownish red by transmitted light. It is associated with pale yellow serpentine, small quantities of white to greyish brown quartz, and white feldspar. There is a very small quantity of green chromiferous silicate.

G.C. Hoffmann (1903, p. 12)

1266. **CHROMITE.** From a country rock originally 96% olivine, and 4 to 5% enstatite pyroxene, now 66% antigorite serpentine; from a chromite pit on the north slope of Kerr Hill at a 1,300-foot elevation in the bottom of a draw. Coleraine tp., Megantic co., Que.

21–E–E½ (Anal. M.F. Connor) Ser. No. *1930–34*

The chromite is reddish brown and translucent with a gangue of antigorite serpentine, and inclusions of fresh and altered olivine. No picotite or magnetite is visible.

E. Poitevin (1931, p. 19)

1267. **CHROMITE.** From a country rock consisting of 60% mesh antigorite serpentine; the chrome pit on the southeast slope of Quarry Hill, at a 1,200-foot elevation near Lake Caribou, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. R.J.C. Fabry) Ser. No. *1930–24*

Massive, non-magnetic chromite, with a tendency to cleave in one direction. No serpentine is visible. Small amounts of picotite are seen in thin sections with serpentinized dunite present as gangue, but there is no trace of magnetite and the chromite along fractures traversing it shows no signs of oxidation. Many of the picotite crystals are altered to serpentine. The chromite is reddish brown and translucent.

E. Poitevin (1931, p. 19)

1268. **CHROMITE.** Montreal chrome pit, Megantic co., Que.

21–L–W½ (Anal. ?) Ser. No. *1932–2*

(E. Poitevin)

	1265	1266	1267	1268	1269
SiO_2	0.60	0.47		2.14	
Al_2O_3	13.83	14.23	15.63	12.16	11.30
Fe_2O_3		4.16		6.06	
FeO	14.64	14.51	14.60	10.04	21.28
MgO	15.01	12.80	17.62	14.88	18.13
CaO		0.50	trace	0.69	
H_2O				1.60	
TiO_2		0.08	0.22	0.15	
MnO		0.20	nil	trace	
Cr_2O_3	55.90	53.94	52.21	51.86	49.75
NiO		0.20	0.13	0.09	
Total	99.98	101.09	100.41	99.67	100.46
Sp.gr.	4.239				

1269. **CHROMITE.** From a huge boulder near the outlet of Lake Memphremagog

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1847–1*

T.S. Hunt (1849, p. 164)

1270. **CHROMITE.** On a northern slope of Taylor Basin, B.C.

92–J–E½ (Anal. R.A.A. Johnston) Ser. No. *1915–1*

A small deposit of massive chromite of good quality associated with serpentine and a reddish weathering peridotite.

C.W. Drysdale (1916, p. 83)

1271. **CHROMITE.** From a vein a foot in diameter in serpentine; Bolton tp., Brome co., Que.

31–H–E½ (Anal. T.S. Hunt) Ser. No. *1847–2*

T.S. Hunt (1849, p. 164)

1272. **CHROMITE.** Olivine Mountain, Tulameen River, B.C.

92–H–E½ (Anal. R.J.C. Fabry) Ser. No. *1932–5*

(E. Poitevin)

1273. **CHROMITE.** Associated with lherzolite; at the American Chrome Pit east of Morin Hill, at a 1,300-foot elevation on the trail to Peach Lake, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. M.F. Connor) Ser. No. *1930–38*

Brownish red chromite with edges and partings oxidized to black ore. Olivine inclusions are absent but idiomorphic crystals of picotite are present. Matrix is a low birefringent chlorite derived from diallage. Chromiferous penninite is also present.

E. Poitevin (1931, p. 19)

	1270	1271	1272	1273	1274
SiO_2	4.82		0.75	0.30	1.00
Al_2O_3	19.94	3.20	5.36	20.29	23.63
Fe_2O_3			20.23	5.07	1.12
FeO	12.80	35.68	16.36	16.92	16.69
MgO	12.79	15.03	10.88	11.78	12.18
CaO	0.05		0.39	0.70	0.40
H_2O			0.37		
TiO_2			0.59	0.17	trace
MnO				0.18	0.20
Cr_2O_3	48.72	45.90	45.76	45.16	45.00
NiO			trace	0.50	0.20
Total	99.12	99.81	100.69	101.07	100.42

1274. **CHROMITE.** From country rock, once a typical lherzolite, now 75% serpentine; Ross chromite pit on the south slope at a 1,550-foot elevation, Murphy Hill, Coleraine tp., Megantic co., Que.

21–L–W½ (Anal. M.F. Connor) Ser. No. *1930–36*

The chromite is translucent red and much fissured; some dark zones along the fissures are due to the high indices of refraction of chromite and not to black oxidized ore. The gangue is mesh antigorite serpentine. No magnetite is visible and no inclusions are present in the chromite.

E. Poitevin (1931, p. 19)

1275. **NICKEL ORE.** From a vein cutting a bed of amygdaloid; Michipicoten Island, Algoma district, Ont.

41–N–W½ (Anal. T.S. Hunt) Ser. No. *1854–13*

Massive mineral with an impalpable structure and a brilliant metallic lustre. Brittle, fracture uneven and subconchoidal, tin-white to bronze-yellow in colour. It is a mixture of niccolite and domeykite and is associated with quartz. Analyses (a) and (b) are of different fragments of the same mass.

T.S. Hunt (1857b, p. 388) *See also* No. 1279 (*1854–14*)

1276. **NICCOLITE-GERSDORFFITE.** Southeastern corner of lot 12, sec. 3, Denison tp., Sudbury district, Ont.

41–I–W½ (Anal. T.L. Walker) Ser. No. *1890–49*

Occurs in a small vein interfoliated with a chloritic actinolite schist on the north side of a small area of diorite. The vein consists of quartz, a small amount of feldspar and calcite, with grains of small disseminated masses of sulphide, the most abundant and conspicuous of which are niccolite and gersdorffite.

E.D. Ingall (1893, p. 118)

1277. **NICKEL ORE.** Wallace mine, Lake Huron, Ont.

41–I–W½ (Anal. T.S. Hunt) Ser. No. *1863–25*

A fine-grained, steel-grey mixture.

Geological Survey (1863, p. 506)

1278. **NICKEL ORE.** Found among quartzose and chloritic shales that are interlaminated irregularly with strings and bunches; Wallace mine on White Fish River, Lake Huron, Ont.

41–I–W½ (Anal. T.S. Hunt) Ser. No. *1848–1*

T.S. Hunt (1850a, p. 61)

	1275 (a)	1275 (b)	1276	1277	1278
SiO_2			26.70		28.40
Al_2O_3			5.43		3.21
MgO					4.40
CaO & Na_2O			) 7.29		
$CaCO_3$					4.00
S			10.60	38.16	22.63
Fe			2.43	41.79	24.78
Co			0.64		
Ni	24.55	17.03	20.87	13.93	8.26
Cu	30.81	44.70	trace	0.10	0.06
As	44.67	37.36	26.04	6.02	3.57
Ag	0.25				
Total	100.28	99.09	100.00	100.00	99.31
Sp.gr.	7.35–7.40	7.35–7.40			

1279. **NICKEL ORE.** Cutting a bed of amygdaloid; Michipicoten Island, Algoma district, Lake Superior, Ont.

41–N–W½ (Anal. T.S. Hunt) Ser. No. *1854–14*

Occurs in a gangue of native copper and native sulphur which are scattered through in grains. It is amorphous, greenish yellow to apple-green, with waxy lustre and conchoidal fracture. It is subtranslucent, very soft, polishing under the nail, and falls to pieces when immersed in water. Analyses (a) and (b) are of two portions of the mineral.

T.S. Hunt (1857b, p. 389) *See also* No. 1275 (*1854–13*)

1280. **COPPER NICKEL ORE.** From a veinlet in a body of sulphide-bearing rock 500 feet wide and 200 feet long; on the west slope of a hill about 200 feet south of the No. 1 post of the Arctic No. 5 Mineral Claim, Wekusko Lake, Man.

63–J–W½ (Anal. E.A. Thomson) Ser. No. *1930–26*

Sulphides occur in scattered grains, blebs, lenses, and veinlets through fine- and coarse-grained quartz gabbro. Some are 6 inches wide, but most are less than 2 inches. Small fragments and clusters of crystals of plagioclase, amphibole, biotite, and quartz are visible among the sulphides. These are the essential minerals of the quartz gabbro bordering sulphide veinlets, but are more altered. Veinlets of chalcopyrite cut pyrrhotite; the margin of the pyrrhotite shows a noticeable difference in colour and the lighter phase may carry the nickel.

J.F. Wright (1931, p. 103)

1281. **LEAD ORE.** Wellington mine, Slocan Mining map-area, Kootenay district, B.C.

82–F–W½ (Anal. Mines Branch) Ser. No. *1934–36*

'Black Ore'. The polished surface is composed of dull galena forming a matrix for other ore and gangue minerals that occur mostly as comparatively small fragments in dust-like particles. Chief among these are zinc blende, greatly brecciated with minor proportions of pyrite and chalcopyrite, and possibly minute masses of silver-bearing minerals.

C.E. Cairnes (1934, p. 107)

1282. **GALENA.** From the Black Warrior vein, about 8 inches wide, in the vicinity of Boulder Creek, west of the lower part of Parsnip River, B.C.

93–J–W½ (Anal. Johnston, Matthey and Company) Ser. No. *1879–3*

Nearly pure galena.

G.M. Dawson (1879, p. 111)

	1279 (a)	1279 (b)	1280	1281	1282
SiO_2	35.80	33.60		6.17	69.80
Al_2O_3	) 11.00	8.40		3.87	1.50
FeO		2.25			
MgO	3.37	3.55		0.91	
CaO	3.81	4.09		0.65	
H_2O+	) 12.20	) 17.10		) 1.21	1.00
H_2O-					
P_2O_5				0.03	
S			22.65	17.46	4.80
C				0.16	
Ti			trace		
Fe			35.38	2.82	2.15
Ni			1.78		
NiO	33.20	30.40			
Cu			4.91	0.72	
Zn				15.56	
Ag					0.09
Pb				50.45	20.25
loss					1.41
insoluble			33.90		
Total	99.38	99.39	98.62	100.01	101.00

1283. **MOLYBDENITE ORE.** No. 1 pit, Moss mine, lots 9 and 10, rge. 7, Onslow tp., Pontiac co., Que.

31–F–E½ (Anal. M.F. Connor) Ser. No. *1924–1*

Molybdenite occurs as disseminated flakes and partly as aggregates, in a medium-grained quartz syenite with granular texture and granitic appearance. The diameter of the molybdenite flakes ranges from 1 inch to less than 0.5 mm in the sparsely disseminated ore. The ore consists mainly of quartz, pyrite, fluorite, and molybdenite in aggregates more or less irregular in form, with less common occurrences of hematite, pyrrhotite, magnetite, titanite, feldspar, mica, and pyroxenes.

M.E. Wilson (1924, p. 70)

	1283	1284 (a)	1284 (b)	1284 (c)	1285
SiO_2	62.50				47.43
Al_2O_3	10.50				
Fe_2O_3...........	4.92				
FeO.............	3.76				
MgO.............	0.40				
CaO.............	1.46				
Na_2O............	2.56				
K_2O.............	4.83				
H_2O.............	1.60				
TiO_2............	0.15				
P_2O_5............	0.06				
MnO.............	0.03				
S		28.4	27.28	28.86	
F...............	0.65				
FeS_2............	4.73				1.87
MoS_2	1.58				
Sb sulphide					50.70
Fe..............			0.85	0.85	
Sb		70.1	69.00	68.98	
gangue...........		1.5	1.50	0.81	
Total	99.73	100.00	98.63	99.50	100.00

1284. **ANTIMONY ORE.** Occurred in quartz veins in beds of slate and quartzite; about 25 miles from Fredericton and 3 miles from Saint John River, Prince William parish, York co., N.B.

21–G–W½ (Anal. W.W. Bailey) Ser. No. *1897–2*

Occurred partly in a network of fine veinlets and partly in more considerable masses. Three analyses were made.

L.W. Bailey (1898, pp. 30–32)

1285. **ANTIMONY ORE.** Occurred in quartz veins in beds of slate and quartzite; about 25 miles from Fredericton and 3 miles from the Saint John River, Prince William parish, York co., N.B.

21–G–W½ (Anal. ?) Ser. No. *1897–4*

Occurred partly in a network of fine veinlets and partly in more considerable masses.

L.W. Bailey (1898, pp. 30–32)

1286. **FLUORSPAR.** Veins occupying fault fissures; Noyes mine, Moira Lake group of deposits, Huntingdon tp., Hastings co., Ont.

31–C–W½ (Anal. Algoma Steel Corp.) Ser. No. *1921–6*

The most characteristic features of the deposits are the presence of two ore zones separated by a zone of fractured or brecciated wall-rock and of lenticular masses of ore, ranging from a few inches to 10 feet wide. The material occurs as alternating bands or irregular networks forming the partition between caverns. The veins consist chiefly of varying proportions of fluorspar, barite, and calcite, with the relative abundance varying greatly. Less common minerals are celestite, quartz, pyrite, marcasite, chalcopyrite, tetrahedrite, malachite, and elaterite.

M.E. Wilson (1921, p. 43)

	1286 (a)	1286 (b)	1286 (c)	1286 (d)	1286 (e)	1286 (f)
SiO_2	1.37	2.97	2.33	3.07	3.60	2.40
$CaCO_3$...........	6.75	7.85	10.04	7.16	10.76	10.31
CaF_2	84.35	81.81	80.68	80.24	74.05	73.52
$BaSO_4$	5.34	5.30	5.10	7.54	9.34	11.88
R_2O_3............	2.10	1.88	2.00	1.20	3.00	1.20
Total	99.91	99.81	100.15	99.21	100.75	99.31

PARTIAL ANALYSES OF ORES

1287. **HEMATITE.** Small island near the outlet at Matonipis Lake, in the watershed of Outard River, Que.

22–N–W½ (Anal. Mines Branch) Ser. No. *1952–16*

SiO_2 31.19%; Fe 45.81%; P undetected; S 0.02%.

(A. Dumas)

1288. **HEMATITE.** Pictou co., N.S.

11–E–E½ (Anal. G.C. Hoffmann) Ser. No. *1873–5*

Earthy, containing a few fossil shells.
Fe_2O_3 60.71%; MnO 0.18%; S 0.09%; H_3PO_4 0.63%; insoluble 29.98%; Fe 42.50%.

B.J. Harrington (1874b, p. 223)

1289. **IRON ORE.** Oxide enrichment bodies from primary carbonates, in a series of roughly parallel lenses whose boundaries in detail are exceedingly irregular; they lie in close proximity to the post-Pennsylvanian fault marking the south face of the Cobequid Mountains from the open-cut, Peter Totten Meadow, Colchester co., N.S.

11–E–W½ (Anal. Bureau of Mines) Ser. No. *1948–16*

Red earthy hematite, occurring where the primary carbonate bodies have undergone oxide enrichment by surface waters.
MgO 0.80%; CaO 33.58%; CO_2 26.72%; insoluble 0.18%; Fe 23.06%.

L.J. Weeks (1948, p. 52) *See also* Nos. 1181, 1180, 1183, 1182, 1290, 1184, 1302 (*1948–11, 12, 13, 14, 15, 17, 18*)

1290. **IRON ORE (LIMONITE).** Oxide enrichment of primary carbonate bodies, which are a series of roughly parallel lenses whose boundaries in detail are exceedingly irregular; they lie in close proximity to the post-Pennsylvanian fault marking the south face of Cobequid Mountains from the open-cut, Peter Totten Meadow, Colchester co., N.S.

11–E–W½ (Anal. Bureau of Mines) Ser. No. *1948–15*

Dark brown or black limonite occurs as oxide enrichment of primary carbonate bodies.
MgO 0.36%; CaO 0.50%; CO_2 3.98%; insoluble 0.11%; Fe 57.35%.

L.J. Weeks (1948, p. 52) *See also* Nos. 1181, 1180, 1183 1182, 1289, 1184, 1302, (*1948–11, 12, 13, 14, 15, 16, 17, 18)*

1291. **BOG IRON.** Two miles upstream from Beaton River Bridge and ¼ mile south of the river, Alaska Highway, B.C.

94–G–W½ (Anal. R.J.C. Fabry) Ser. No. *1943–10*

The deposit covers an area of several hundred square feet, and is more than 10 inches deep. It is of post-glacial age and is believed to have precipitated from spring waters issuing from the shales of the River St. John Group.
Fe_2O_3 79.70%; H_2O 15.11%; MnO trace; insoluble 3.50%.

C.O. Hage (1944, p. 20)

1292. **BOG IRON.** Five miles above the bridge on the north side of the river and on the pack trail to Lily Lake, Beaton River, Alaska Highway, B.C.

94–G–W½ (Anal. R.J.C. Fabry) Ser. No. *1943–10*

Description same as No. 1291.
Fe_2O_3 78.10%; MnO nil; H_2O 19.38%; insoluble not weighed.

C.O. Hage (1944, p. 20)

1293. **LIMONITE.** Big Island, Lake Winnipeg, Man.

62–P–E½ (Anal. G.C. Hoffmann) Ser. No. *1886–10*

Analyses:
(a) Limonite: Fe_2O_3 73.64%; H_2O+ 13.57%; H_2O- 4.74%; insoluble 2.23%; Fe 51.55%.
(b) Limonite through which was disseminated rounded grains of quartz: Fe_2O_3 39.34%; H_2O+ 6.45%; H_2O- 1.20%; insoluble 48.12%; Fe 27.54%.

G.C. Hoffmann (1887, p. 19)

1294. **MAGNETITE.** Lot 17, rge. 11, Olden tp., Frontenac co., Ont.

31–C–E½ (Anal. G.C. Hoffmann) Ser. No. *1880–10*

Massive, coarse, crystalline, greyish black magnetite with metallic lustre. It is perfectly free from titanium dioxide.
Fe_2O_3 68.15%; FeO 28.98%; H_2O 0.06%; insoluble 1.36%; Fe 70.24%.

G.C. Hoffmann (1883, p. 8)

1295. **MAGNETITE.** Leduc Mine, lot 23, rge. 6, Wakefield tp., Hull co., Que.

31–G–W½ (Anal. E.B. Kendrick) Ser. No. *1886–16*

Compact, greyish black, strongly magnetic magnetite with metallic lustre.
Fe_2O_3 64.59%; FeO 30.82%; H_2O 0.07%; TiO_2 trace; H_3PO_4 0.03%; insoluble 1.55%; Fe 69.19%; P 0.01%.

G.C. Hoffmann (1887, p. 16)

1296. **MAGNETIC IRON ORE.** East half of lot 6, rge. 10, Fitzroy tp., Carleton co., Ont.

31–F–E½ (Anal. G.C. Hoffmann) Ser. No. *1879–8*

Massive, compact, greyish black, strongly magnetic material in parts coated with ferric hydrate. In some of the fragments the cleavage was perfect. It contained occasional angular cavities, more or less completely filled with vein mineral resulting from the decomposition of iron pyrites. Unaltered fragments of the latter were occasionally found in some of the cavities.
Fe_2O_3 57.87%; FeO 31.16%; H_2O 0.05%; TiO_2 5.29%; insoluble 2.83%; Fe 64.75%.

G.C. Hoffmann (1881, p. 16)

1297. **IRON ORE.** Occurs as several thin bands interstratified with dark hornblendic rock and with red orthoclase gneiss; on the road that follows the north bank of the road near St. Jerome, Terrebonne co., Que.

31–H–W½ (Anal. F.D. Adams) Ser. No. *1894–15*

Fe_2O_3 59.06%; FeO 26.81%; S trace; H_3PO_4 0.02%; TiO_2 nil; insoluble 9.90%; Fe 62.19%; P 0.01%.

F.D. Adams (1896a, p. 110)

1298. **MAGNETIC IRON ORE.** Lot 13, rge. 10, Bagot tp., Renfrew co., Ont.

31–F–E½ (Anal. F.D. Adams) Ser. No. *1885–2*

Massive, fine granular, dark steel-grey, magnetic material consisting of minute octahedral crystals of magnetite, more or less isolated or in small aggregations mixed with hematite.
Fe_2O_3 57.35%; FeO 25.46%; H_2O 0.10%; TiO_2 nil; H_3PO_4 0.16%; insoluble 14.59%; Fe 59.95%; P 0.07%; S 0.71%.
G.C. Hoffmann (1885, pp. 18–19)

1299. **MAGNETITE.** In a vein 10 to 14 feet wide in a hard chloritic and feldspathic schist associated with quartz and jasper; lot 21, rge. 6, Ascot tp., Sherbrooke co., Que.

21–E–W½ (Anal. E.B. Kendrick) Ser. No. *1886–11*

Massive, very fine crystalline, slightly calcareous ore. It is greyish black with a greenish tinge.
Fe_2O_3 49.78%; FeO 24.73%; H_2O– 0.22%; TiO_2 nil; S 0.02%; H_3PO_4 1.51%; insoluble 11.24%; Fe 54.07%; P 0.66%.

G.C. Hoffmann (1887, p. 18)

1300. **MAGNETITE.** In the vicinity of Little Gull Lake, Thunder Bay district. Ont.

52–G–E½ (Anal. E.B. Kendrick) Ser. No. *1886–14*

Compact, dark steel-grey, magnetic ore.
Fe_2O_3 55.46%; FeO 18.27%; H_2O- 0.20%; TiO_2 nil; insoluble 23.25%; Fe 53.03%.

G.C. Hoffmann (1887, p. 17)

1301. **MAGNETITE.** North Mountains, Annapolis co., N.S.

21–A–W½ (Anal. F.G. Wait) Ser. No. *1894–19*

Fine granular magnetite.
Fe_2O_3 49.70%; FeO 23.12%; insoluble matter (silica) 17.96%; Fe 52.77%.

G.C. Hoffmann (1896, p. 16)

1302. **IRON ORE.** Associated with primary carbonate bodies, which are a series of roughly parallel lenses whose boundaries are in detail exceedingly irregular; they lie in close proximity to the post-Pennsylvanian fault marking the south face of Cobequid Mountains, at the dump of the open-cut, Peter Totten Meadow, Colchester co., N.S.

11–E–W½ (Anal. Bureau of Mines) Ser. No. *1948–18*

Black and specular ore, which is essentially carbonate cut by stringers and specularite, with limonite deposited throughout the carbonate. This mineral assemblage is then replaced on a small scale by a white carbonate close to calcite.
MgO 1.86%; CaO 15.29%; CO_2 34.22%; insoluble 0.32%; Fe 35.09%.

L.J. Weeks (1948, p. 52) *See also* Nos. 1181, 1180. 1183, 1182, 1289, 1290, 1184 *(1948–11, 12, 13. 14, 15, 16, 17)*

1303. **ILMENITE.** In a bed of granular iron ore in serpentine; Seignory of St. Francis, Vaudreuil parish, Beauce co., Que.

21–L–E½ (Anal. T.S. Hunt) Ser. No. *1847–3*

Brilliant black powder separated magnetically from magnetic iron.
Fe_2O_3 40.70%; MgO 2.44%; H_2O and loss 4.06%; TiO_2 48.60%; insoluble 4.20%.

T.S. Hunt (1849, p. 165)

1304. **IRON ORE.** Big Island, Lake Winnipeg, Man.

62–P–E½ (Anal. G.C. Hoffmann) Ser. No. *1886–20*

Quartz with limonite and a little hematite.
Fe_2O_3 17.19%; H_2O+ undetermined; H_2O- 0.36%; insoluble 77.03%; Fe 12.03%.

G.C. Hoffmann (1887, p. 19)

1305. **IRON ORE.** From a trench across the width of 15½ feet of oxidized manganiferous siderite, which has extensively replaced limestone; on the claim above the portal of the upper adit contact claim (Black Prince) on the lower southwestern slope of Kaslo Creek valley, 200 feet above the railway, B.C.

82–F–W½ (Anal. A. Sadler) Ser. No. *1932–35*

Siderite at the surface is extensively oxidized and carries here and there a little sulphide, including galena, blende, and pyrite. At depth oxidation is slight.
SiO_2 8.04%; Fe_2O_3 59.93%; MgO 0.08%; CaO 0.42%; H_2O+ 8.92%; P_2O_5 0.11%; MnO nil; CO_2 0.76%; sulphur 0.10%; MnO_2 19.23%; NiO nil; Mn (calculated) 12.15%.

G. Hanson (1932, p. 113)

1306. **MANGANESE ORE.** From the lower eastern slope of Kaslo Creek, about 2 miles above Zwicky and 7 miles from Kaslo, Lawson mining division, B.C.

82–F–W½ (Anal. A. Sadler) Ser. No. *1932–37*

Unconsolidated wad forming surface soil is in places covered by a thin layer of wood ash due to forest fires. The deposit consists of various forms of wad interstratified with, but fairly distinct from, varying proportions of hydrous iron oxides, calcareous tuffs of sinter and layers of clayey subsoil.
SiO_2 12.03%; Fe_2O_3 3.75%; MgO 0.72%; CaO 3.40%; H_2O+ 10.80%; P_2O_5 0.21%; MnO_2 49.94%; CO_2 6.44%; S 0.05%; NiO 0.22%; CO 0.01%; Mn (calculated) 31.57%.

G. Hanson (1932, p. 110)

1307. **MANGANESE ORE.** From a 20-inch manganese-rich vein exposed for 25 feet, but which may extend beneath the highway and the low drift-covered area south and west of the highway; 40 feet east of the Alaska Highway near Mile 1212, Yukon Territory.

115–K–E½ (Anal. R.J.C. Fabry) Ser. No. *1951–18*

The vein is composed largely of the manganese oxide mineral psilomelane containing some partly replaced rhyolitic tuff, which forms the wall-rock.
Fe_2O_3 1.38%; CaO trace; H_2O 5.44%; Mn_2O_3 71.83%; insoluble 21.59%.

(E.D. Kindle)

1308. **CHROMITE.** Black Lake, Ireland tp., Megantic co., Que.

21–L–W½ (Anal. ?) Ser. No. *1913–4*

Occurs as masses of pure ore and as disseminations in the country rock too poor to be used as ore. It consists of two parts: a reddish brown translucent substance, which in high grade ore makes up as much as

90%, and a black opaque material, which is in excess in the poor ore. In specimens of medium ore the two portions are distinct from each other though often intricatelv intergrown. (a) Reddish brown, less magnetic, more friable portion:

SiO_2 6.54%; Al_2O_3 10.34%; FeO 13.94%; MgO 16.70%; CaO 2.50% H_2O 2.15%; TiO_2 0.12%; MnO 0.32%; CO_2 2.46%; Cr_2O_3 45.30%.

(b) Black, opaque, magnetic portion:

SiO_2 4.10%; Al_2O_3 11.34%; FeO 15.66%; MgO 15.66%; CaO 1.50%; MnO 0.36%; TiO_2 0.12%; CO_2 1.45%; Cr_2O_3 48.20%; H_2O 2.05%.

J.A. Dresser (1913, p. 78)

1309. **ZINC-LEAD-COPPER ORE.** The country rock consists of a volcanic series, with interbanded carbonates apparently an alteration of the volcanic rocks, which are intruded by plutonic rocks consisting of diabase, quartz, porphyry, and porphyrite; Stirling, Richmond co., N.S.

11–F–E½ (Anal. ?) Ser. No. *1918–15*

The ore consisted of a fine-grained intimate mixture of the following sulphides in order of their abundance: sphalerite, pyrite, galena and chalcopyrite containing small amounts of gold and silver. The ore varies from a high grade ore, consisting of an almost soft sulfide mass accompanied by a small amount of gangue which is principally calcite with subordinate quartz, to a low grade ore consisting largely of calcite with some quartz containing a small amount of sulphide disseminated in small masses.

SiO_2 23.12%; Al_2O_3 1.74%; MgO 3.42%; CaO 3.39%: Cl nil; S 22.06%; Fe 10.60%; Zn 20.82%; Pb 4.95%; Cu 1.65%; Ag 4.77 oz per ton; Au 0.06 oz per ton.

A.O. Hayes (1919, p. 22)

1310. **SPHALERITE.** From a lens-shaped orebody in a band of schist with massive greenstones on either side; Mandy mine, situated on a small peninsula on the west side of the northwest arm of Schist Lake, 2 miles south of the northern end of the arm, Flin Flon map-area, Man.

63–K–W½ (Anal. ?) Ser. No. *1922–7*

Sphalerite occurs with chalcopyrite, galena, pyrite, and arsenopyrite. Massive with no sign of cleavage or crystal faces, it is dark in colour with metallic lustre. Chalcopyrite and sphalerite form a well-banded variety of ore locally, but in this type the chalcopyrite is present in the sphalerite bands and vice-versa, with no evidence of fracturing or subsequent introduction of one mineral into the other. The gangue minerals are quartz and carbonates.

Zn 46.21%; Cu 1.70%; Fe 12.80%; Au 0.07 oz troy/ton, Ag 0.85 oz troy/ton.

F.J. Alcock (1923, p. 29)

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40.	40–I–E/2	Sedimentary rocks:	536
	40–P–E/2	" "	551, 552, 554, 710, 742, 760, 767
	40–P–W/2	" "	606, 620, 629
41.	41–A–E/2	Sedimentary rocks:	599, 706
	41–A–W/2	" "	545, 578, 699
	41–G–E/2	" "	568
	41–G–W/2	" "	558, 593
	41–H–E/2	Igneous intrusive rocks:	24, 44, 53, 56, 59, 66, 76, 82, 95, 108, 125, 127
		Minerals:	1095
	41–H–W/2	Igneous intrusive rocks:	49
		Sedimentary rocks:	494
		Minerals:	848, 852, 1147
	41–I–E/2	Igneous intrusive rocks:	40, 77, 100, 115
	41–I–W/2	" " "	70, 94, 96, 129, 155, 183
		Minerals:	848, 852, 1147
		Ores:	1276–1278
	41–J–E/2	Sedimentary rocks:	595, 765
	41–J–W/2	Metamorphic rocks:	318
		Sedimentary rocks:	491
	41–N–E/2	Igneous intrusive rocks:	6, 239, 240–243
		Minerals:	864
	41–N–W/2	Ores:	1275, 1279
	41–O–E/2	Sedimentary rocks:	709
	41–P–E/2	Igneous intrusive rocks:	135, 152, 158
		Metamorphic rocks:	483
		Sedimentary rocks:	515
		Minerals:	866, 985
	41–P–W/2	Igneous intrusive rocks:	133
42.	42–A–E/2	Sedimentary rocks:	538
	42–C–E/2	Igneous intrusive rocks:	163
		Metamorphic rocks:	415, 420
		Ores:	1259
	42–D–W/2	Sedimentary rocks:	575
	42–I–W/2	" "	644–646
		Ores:	1277
	42–J–E/2	Sedimentary rocks:	485, 537
	42–J–W/2	" "	487, 525, 530
	42–N–W/2	" "	753
52.	52–A–E/2	Igneous intrusive rocks:	131, 146
		Sedimentary rocks:	521, 575, 714
		Ores:	1260
	52–A–W/2	Minerals:	1123
	52–B–W/2	Sedimentary rocks:	493, 724, 726
	52–C–E/2	" "	677

Ontario (cont'd)