

III.—*List of Newfoundland Minerals.*

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THE following list includes only such minerals as have come under my own observation, or that of such authorities as can be relied upon. Amongst the latter I may mention, Mr. John Milne, Professor of Mineralogy, Yedo, Japan; the late Mr. Hennessey, M.E., and Mr. Barclay, assayer, Belt's Cove Mine.

I have adopted Dana's nomenclature as that most familiar on this side of the Atlantic, and have arranged the names alphabetically, for convenience.

Alum shale.	COPPER GLANCE.
Antimonite.	COPPER PYRITES.
Apatite.	COPPER, Red Oxide.
Argentiferous Galena.	Cyanite.
,,    Pyrites.	DIALLAGES.
,,    Quartz.	DOLOMITE.
AUGITE.	Enstatite.
Auriferous    ,,	EPIDOTE.
BARYTA (sulphate of)	ERUBESCITE.
Bismuth, traces.*	FELDSPAR, Orthoclase.
Bitumen (crystalline.)	Fluor
Blende.	GALENA.
BRONZITE.	GARNET.
Cadmium, traces*	Gold, native*
CALCITE, Iceland spar.	GRAPHITE.
,,    DOG-TOOTH spar.	GYPSUM, SNOWY.
,,    NAIL-HEAD    ,,	,,    SELENIUM.
Chalybite.	HORNBLÉNDE.
CHLORITE.	,,    ASBESTUS.
Chromite.	,,    ACTINOLITE.
Chrysolite.	HEMATITE
Chloanthite.	Horn Silver*
COAL (bituminous)	Hypersthene?
Cobalt, traces*	ILMENITE.
COPPER, native	IRON PYRITES.

IRON JASPERY ORE.	QUARTZ, AMEYTHSTINE.
„ BOG ORE.	„ CHALCEDONY.
KAOLIN (clay).	„ AGATE.
LABRADORITE.	„ JASPER, FLINT, &c.
MAGNETITE.	Rhodonite?
MALACHITE.	Rutile.
MANGANESE (carb. of)	SALT (common)
MICA.	SERPENTINE.
Millerite.	„ PICROLITE.
MISPICKEL.	Silver, native*
Molybdenite.*	„ Ruby.*
NICKEL COPPER.	STAUROLITE.
OCHRE, RED & YELLOW.	TALC.
Opal.*	„ STEATITE.
Petroleum.	TETRAHEDRITE.
PSILOMELANE?	Tombazite* (Gersdorffite)
Pyrosclerite.	TOURMALINE.
PYRRHOTINE.	„ RUBELLITE.
QUARTZ.	Vivianite?*
QUARTZ, ROCK CRYSTAL.	WAD.

In the above list the large type indicates common species, those marked with an asterisk are rare, and the note of interrogation denotes doubtful minerals.

The apparent absence of many important groups, and the paucity of species generally, is not so much indicative of their non-existence, as of the fact that so few persons here are interested in their collection. Those who are at present engaged in the development of our mines, pay little attention to any minerals not of a commercial value; while my own opportunities of collecting have been hitherto chiefly prevented by an excess of topographical and geological work. I have no doubt that in course of time, however, I shall be enabled to add many others to the list, which is merely preliminary to a more extended one.

Newfoundland is just beginning to take its place amongst the mining regions of the globe; as yet her copper ores only have attracted attention. It is but reasonable to suppose that the time is not far distant, when many of her other economic materials will be profitably wrought. This supposition is founded on the fact that the latest rock deposit is of no more recent date than lower carboniferous, while the 42,000 square miles, which comprise the surface area of the island, are spread over by most of the older or pre-carboniferous formations. Many great belts of intrusive and metamorphic rocks cross the island

diagonally, or occupy immense areas, both in the interior and along the coast-line; in which frequent indications of various mineral substances are known to occur.

The absence of railways, or any means of interval transport, necessarily renders all products not immediately on the sea coast unavailable at present; and for the same reason it is now a difficult matter to get about the interior, or make any extensive collection of minerals, owing to the difficulty of conveying them hence.

In connection with this subject, a short notice of the principal mining localities, and the mode of occurrence of the ores, &c., may not be out of place.

The mines of Tilt Cove, Belt's Cove, Naked Man, Little Bay, Hall's Bay, Rabbit's Arm, and Seal Bay are all situated in the Great Bay of Notre Dame; the principal ores worked being those of copper. Yellow sulphide, of a low percentage, ranging from 6 or 7 per cent. to 30 per cent., forms the chief product. The low percentage of the ore in the abovenamed localities is counterbalanced by its abundance. Tilt Cove shipped between the years 1867 and 1873, 33,687 tons; and Belt's Cove, in less than five years from its inception, the enormous quantity of 95,000 tons. Little Bay mine was only opened in August, 1878, and had shipped to the end of that same year 10,000 tons. The other localities mentioned above have only recently been opened up, and as yet there have been no returns from them. Copper ore occurs in many other parts of this Bay, often of a very promising character. The ore is found chiefly embedded in chloritic slate, or as at Tilt Cove, in a compact chloritic rock; but at Rabbit's Arm it occurs in parallel bands of quartz. Much of the ore in the slate bands presents the appearance of stratification, or at least corresponds with the bedding of the slate; even partaking of the various corrugations of the latter. Huge masses frequently occur, especially where the bed rocks are most affected by sharp folds, or otherwise disturbed.

Native copper is found sparingly in the Tilt Cove mine, and as thin films, frequently of a beautiful arborescent form, is also met with in a few other localities in this Bay. It occurs on the west coast of the island, in small strings and nodules, in Port-a-Port Bay and Bay of Islands; where it is found embedded in an amygdaloidal trap rock. Copper Pyrites is met with in many other parts of the island and nearly every one of its great bays, but nowhere in such quantity as in Notre Dame Bay. Variegated copper ore, copper glance, erubescite, tetrahedrite, &c., occur at several parts of Conception Bay, usually in quartz veins; and again on the east coast, and in Placentia Bay.

Beautiful specimens of what the miners term Peacock ore have come from the latter place.

Some of these ores are very rich, yielding between 75 and 80 per cent. copper; but hitherto, though several attempts have been made to work them the result has been in each case an unprofitable one. Nickel has been found by analysis, together with Cobalt, in many of our serpentine rocks, but the former ore has only been met with in workable quantities at Tilt Cove. One hundred and sixty-five tons were shipped from there previous to the recent fall in price.

Copper Nickel and Chloanthite are the principal ores, small quantities of Millerite and Tombazite (Gersdorffite) being associated with them in a gangue of a dolomitic character.

Iron ores are abundant in the island, and are found in association with all the copper ores, especially pyrites, which forms fully half the products of these mines. Magnetic iron, in great masses, accompanies the Tilt Cove copper ore, but occurs more sparingly at the other mines. It is met with also in several other localities, notably, amongst the Laurentian granites and gneiss. Chromic iron in association with serpentine rocks, frequently occurs. All the other ores of iron mentioned are quite common, being generally distributed over most parts of the island.

Lead (galena) is also a pretty generally diffused ore, but has so far only been worked in one or two localities. Its gangue is either calcspar or quartz, except in one noted instance, at a place named Laun on the southern coast, where it occurs in a matrix of greenish fluor spar. The ore has been worked for many years at the La Manche Mine in Placentia Bay, from a vein of calcspar averaging 6 feet in width, which was well charged with galena, and contained also a little copper pyrites. Beautiful amethystine quartz crystals were found lining vughs in this vein, which also yielded the opal mentioned, the only one I have ever come across.

Lead has been worked in Port-a-Port Bay in a matrix of crushed carboniferous limestone, which afforded a considerable quantity of ore, but the work had to be suspended, owing to the anomalous position in which we are placed in reference to that part of the island. Most of the galenas contain a small percentage of silver. It has also been found by analysis in an ore of iron from Bonairsta Bay, and in quartz from Bay of Islands. Native silver, horn silver, and ruby silver, in small quantity were taken from the Laun Lead Mine referred to above.

Gold has as yet been found but sparingly in quartz veins ; some good specimens were recently brought from the neighbourhood of Brigus in Conception Bay. Its existence in quartz from several localities, and also in some of the iron and copper ores, has been proved by analysis ; and there is every reason to believe that ere long it will be met with in quantities sufficient to render it of economic importance.

Zinc Blende is usually found in association with the lead and copper ores, but not in any great quantity. A reddish variety from the Laun Mine yielded traces of cadmium.

Rutile occurs in vitreous quartz in White Bay.

Molybdenite also in quartz, has only been found at Deer Lake, on the Humber River.

Antimonite, associated with galena and zinc-blende, is found at Morton's Harbor, in Notre Dame Bay. Manganese in the form of wad is very common. A massive black variety which I have called Psilomelane? and also Rhodonite? forms a considerable deposit near Topsail, in Conception Bay.

Baryta, or heavy-spar is a pretty abundant mineral ; a wide vein, having a pinkish tinge, is seen near St. Brede's in Placentia Bay.

Coal is confined to the carboniferous areas on the western side of the island ; one in St. George's Bay, and the other near the head of Grand Pond on the Humber River. In the former area several small seams are known to exist, only two of which appear to be of sufficient thickness to be economically important. During last summer a bore hole was tried in the latter area, which resulted in the finding of five small seams, the largest of which was but 1.4 inches. Gypsum in immense masses, frequently of a superior quality for stucco work, accompanies the lower carboniferous limestones in these regions. Veins of beautiful selenite are met with at times traversing these masses.

Petroleum in small quantity is seen oozing through the sand on Shoal Point, Port-a-Port Bay.

To enter into particulars of the various localities in which the more common earthy minerals occur would render this paper needlessly long. It will be sufficient to state generally, that the siliceous varieties are common throughout the island, while those partaking more or less of a magnesian character, usually accompany the metamorphic serpentinous groups of rock.

The aluminous varieties, especially the felspars, labradorites, garnets, tourmalines, cyanites, staurotides, micas, &c., are found in

abundance amongst the rocks of Laurentian age, but are not all confined to this formation.

The crystalline Bitumen, which was obtained from a brecciated trappean mass, intersecting Lower Silurian limestones, &c., in Port-a-Port Bay, seems to have resulted from the heating action of the igneous mass coming in contact with a set of bituminous limestones and shales. It is from the latter rocks also that the Petroleum is derived.

Brine springs, containing much saline matter, accompany the gypsiferous deposits of the carboniferous formation, and the rocks in their immediate vicinity are frequently incrustated with a fine coating of salt.

It may be worthy of note that the ruby silver, found at Laun, has not, I understand, been met with any where on the continent north of Mexico.