

This is then knife-trimmed and taken to the tables for thin splitting. The chief and essential characteristic of mica is its highly perfect basal cleavage, permitting the mineral to be split exceedingly thin. This characteristic is made use of in thin splitting. The purpose of the mica being thin split is to enable it to be built up into what was described above as micanite. Most of the mica mined in Ontario is shipped to the United States.

Canada has for some years been the second largest producer of mica in the world, India producing the greatest tonnage. The India mica is all white mica, or Muscovite, of which quality of mica Ontario produces none, although we have some pegmatite veins containing white mica, which have been but little explored.

Canada can thus be said to rank first in the production of phlogopite.

THE MARBLE BAY COPPER DEPOSIT

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(By permission of the Director, Geological Survey of Canada. Toronto meeting, 1907.)

INTRODUCTION.

During a reconnaissance survey of part of the southern coast of British Columbia, in the summer of 1906, the writer had an opportunity of examining briefly the ore deposits occurring on Texada Island. One type of deposit is of particular interest, both on account of its being in a contact metamorphic zone and of its economic importance in containing valuable ores of copper. These deposits have previously been described in the reports of the Provincial Mineralogist, and in several papers by Mr. W. M. Brewer. In his later papers Mr. Brewer has drawn attention to certain deposits occurring on Gribbel Island, and in the White Horse District, Yukon Territory*, and shows that in mode of occurrence they are very similar to those on Texada Island.

The object of this paper in describing an example of this type is to again emphasize the economic importance of these deposits lying in widely separated areas, and to show that they are worthy of the careful consideration of those interested in mining.

GEOGRAPHICAL POSITION.

Texada Island, named by Elsa in 1791, lies in the Strait of Georgia, its south-east end being about 80 miles north of Victoria, and 47 miles from Vancouver. (See Fig. 1, Inset Map.) The town of Van Anda, where the chief mines are situated, is about 75 miles from Vancouver, and is a port of call of the Union Steam Ship Company. The island has a length of 30 miles with a maximum width of $6\frac{1}{2}$ miles. High and mountainous throughout, especially in the eastern half, where Mount Shepherd attains a height of 2,900 feet, it presents to the observer when viewed at a distance the appearance of part of a submerged mountain chain. The shores are very rugged, with bold cliffs fringed in part with narrow boulder beaches. Sand and gravel beaches are few and there are only three harbors, Marble, Gillies and Blubber Bays, the two latter being somewhat exposed in certain winds.

GENERAL GEOLOGY.

The island is underlain by the Vancouver series of Dawson, part of which has been referred to the Triassic. There seems, however, to be an entire absence of fossils in the associated limestones, and part, if not all, of the series may belong to the Paleozoic era. The series admits of two divisions. The lower is composed of chlorite and hornblende schists, tuffs, amygdaloidal lavas, porphyrites and agglomerates which show over small areas obscure bedding. The upper division consists of limestone, which varies from a massive thick bedded unaltered rock to a fine grained pure white marble.

Subsequent to the deposition of the limestone there was considerable volcanic activity, and the whole of the Vancouver series was much disturbed by intrusions of diorite, gabbro, hornblende and augite porphyrites and diabases. The relations of these rocks with the limestones are well seen where they have intruded as dykes, sills and irregular masses faulting, and marbelizing the latter.

These igneous rocks, both older and younger than the limestones, have been much altered, and a large proportion of their present mineral content consists of secondary epidote, magnetite, chlorite, pyrite and calcite. They are widely developed and underlie the greater part of the island. The limestone, with the exception of a few small outliers, appears only at the north-west end, where the exposure has a length of $7\frac{1}{2}$ miles, with a maximum width of two. In upper Jurassic times extensions of the great Coast Range batholith, consisting of granites and syenites, penetrated this older series and had a profound effect on them, producing schistose structure and shear zones in many of the igneous rocks, and converting the limestone to various crystalline types along with widespread faulting as the discordant strikes and dips now show.

The coast batholith was followed by a great series of basic dykes, principally diabases, and all the older rocks have been cut by them.

The Cretaceous has a limited exposure at Gillies Bay, consisting of feldspathic sandstones with calcite cement. The beds are probably basal, and are but slightly disturbed with low dips to seaward.

During the Glacial Period the island was eroded by the Strait of Georgia Glacier. A thin mantle of drift covers certain areas composed of sandy boulder clay, the boulders being principally varieties of granite from the main coast.

In the general depression which followed the island was much reduced in size, being some 400 feet lower with respect to sea-level than at present.

ECONOMIC GEOLOGY.

In the early nineties attention was first called to the occurrence of free gold in quartz veins, and later, deposits of rich copper sulphides were found in the limestone. These latter were not considered of any great importance at the time, but subsequent development has proved the contrary. Both divisions of the Vancouver series contain valuable ore bodies, which are found in the eruptive rocks, at their contact with the limestone, and in the limestone.

In the eruptive rocks, the ores occur in shear and fracture zones with quartz and country rock gangue.