

ARTICLE III.—GEOLOGICAL NOTES. METALLIFEROUS SANDS.
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(Read January 9, 1882)

I WOULD direct attention to certain Metalliferous Sands, specimens of which have been added to the collections of the Provincial Museum, and to their affinities.

I.—AURIFEROUS.

This is a specimen from Jegoggin Point. Vide Paper "On the Geology of Digby and Yarmouth Counties." Trans. 1880-81.

In this Paper I directed attention to the *Garnet sand* of Lake George, and its origin. I also noticed Jegoggin Point as a locality where rocks are largely micaceous schists, replete with garnets. These were considered to be a continuation of the Lake George rocks, from which the garnet sands were derived. When I was examining Jegoggin Point, with Mr. S. M. Ryerson, I observed great veins of quartz pervading the garnetiferous schists. Mr. R. informed me that gold had been found in them. I was therefore not at all surprised when I heard that Mr. Cowan had found gold in the sands of Lake George. The fact of the existence of a gold mine at Cranberry Point, adjoining Jegoggin Point, and in the same singular belt of rocks, in a manner prepared me for the report. So when Mr. Cowan showed me his gold washings in the Museum, I was convinced of their genuineness by seeing the garnets associated with the gold. He told me at the same time that his washings were not from Lake George. As the other alternative, I suggested Jegoggin Point. He answered that that was the place. When I examined Jegoggin Point I did not take time to examine its sand, as it was down among the rocks; but I inferred that this, too, would be found to be garnetiferous, as well as the sand at Lake George. This inference is sufficiently obvious. The existence of gold in the sand seems to confirm Mr. Ryerson's statement that gold had been found in the quartz veins. Description of specimen: The most striking part of it are numerous scales of gold; these are associated with beautiful crystals of garnet, having sharp angles; there are also grains of magnetite and

silica. The magnet readily separates the magnetite. There are other black grains which may be hornblende. Hornblende is seen in the schists as well as garnets. The gold and silica may be derived from the quartz vein. Grains of magnetite may exist in the schists in the same way as it occurs in the Archæan gneisses of the Cobequid mountains. Vide Paper "*Archæan Gneisses of the Cobequids Magnetitic.*" Trans. 1880-81. The association of gold with garnets and magnetite in the auriferous "Archæo-Cambro Silurian (lower) of Nova Scotia seems to be of additional interest, as it suggests relationship with distant and foreign auriferous formations where gems and gold with magnetite are seen associated. It certainly has a tendency to correlate the "Nova Scotia Gold Fields" with the "Medicine Bow Range," Wyoming, U. S. This is regarded as having a "strong resemblance" to "characteristic beds" of the "Huronian formation in Canada." "The rock masses which form the Medicine Bow Range have as constituents quartz, orthoclase, plagioclase, hornblende, mica, chlorite and carbonate of lime. As accessory minerals there occur garnet, epidote, magnetite, pyrite, cyanite, gold and calcite; under the microscope, in addition to the above, were detected, zircon, apatite and titanite." Descriptive Geology. Medicine Bow Range. By Arnold Hague. Page 109. United States Geological Exploration of the Fortieth Parallel, Clarence King, geologist in charge. Vol. II. Page 109.

We have all the constituent minerals above enumerated as constituents of our rocks, and all the accessory minerals recognized, with the exception of cyanite, zircon and apatite. In the place of these we can substitute staurolite, andalusite, tourmaline, arsenopyrite, calchopyrite and molybdenite. As I use the term Cambrian, as it is understood by H. M. Geological Survey of Great Britain, my nomenclature, Archæo-Cambro-Silurian (lower), will be considered by some as equivalent to Archæan, applied to the Medicine Bow Range, Cambrian and Huronian being regarded as convertible terms. I would observe also that the distinction made by Mr. Hague between his Colorado and Medicine Bow "Archæan," is precisely the same as I make between our great Gold Field series of rocks, and the

Arisaig "Archæan," or the Archæan of Cape Breton, the Cobequid Mountains, &c.

2.—MAGNETITIC.

Through William Ross, Esq., Collector of Customs, Halifax, I have received a specimen of magnetitic sand from Cape Breton. Of 100 grains, the magnet separated 15. The remainder largely consists of garnets and amethyst (?), and possibly titanite; gold is wanting. It is possibly derived from the Archæan crystalline rocks of Coxheath. The locality where it is found being Ball's Creek. It is said to be in considerable quantity. I have not yet *seen* any garnets in the rocks of this series, either in Nova Scotia or Cape Breton. Magnetite is found. *Paper "Archæan Gneisses of the Cobequid Magnetitic, 1880-1."*

3.—MAGNETITIC.

I am indebted to S. D. Macdonald, F. G. S., for the specimen which I am now to describe. It is from Cape Rosier, P. Q. Its weight is 65 grains. Of this, about 10 grains are taken up by the magnet. The remainder consists chiefly of garnets and amethystine grains. It is very like the Cape Breton specimen. Boulders were collected in the same locality. These are of granitic and syenitic gneisses. In the one garnets are seen, and in the other grains of magnetite. So that the rocks that furnished these boulders, in all probability, are the sources of the sand of our specimen. It is therefore of Archæan (Huronian) origin, like the Cape Breton magnetic sand.

4.—MAGNETITIC.

There is yet another specimen in the Museum collection to which I would refer. It is several years since I received it. It was brought for the purpose of getting my opinion of its value. Its mineral constituents are the same as of the three last described, but it far excels these in the proportion of magnetite. It covers the magnet very readily. I think that this was the reason why I did not receive definite information regarding its locality. If the locality is not in Newfoundland, it is in some part of the Labrador coast. There is a piece of magnetite in the specimen. It is doubtless of Archæan origin.

5.—MAGNETTIC.

There are also deposits of magnetite sands in Sable Island. Attention was devoted to these long ago. It is more than 10 years since I received specimens. The late Professor Howe included this sand in his collections at the International Exhibition of London, 1862. It corresponds with the sands of Cape Breton, Cape Rosier, and also No. 4, and is different from the auriferous-magnetic sand of Joggin Point. I never saw gold in any specimen. Prof. Howe, in his analysis, found titanium. Any specimens that I have seen are less magnetic than that of Cape Breton. Mr. Macdonald has anew directed my attention to it by presenting to the Museum a specimen of what he collected during a recent visit to the Island.

Sable Island is 95 miles south-east of Cape Canso, and may be underlaid by an extension of the rocks of either Nova Scotia or Cape Breton of any formation. There can be no doubt that its magnetic sands are of Archæan extraction, and in all probability they are *glacially* transparent, and that from the coast of Labrador, where the Archæan is like that of Cape Rosier, granite and garnetiferous and syenitic and magnetic. The Arctic current, with its ice freight, according to the Admiralty charts, passes along the south side of Sable Island bank, outside of the soundings. This may have been the agency employed in transporting the magnetic sand to Sable Island.

ART. IV. — GEOLOGICAL NOTES. BY SIMON D. MACDONALD, F.G.S.

SABLE ISLAND.

(Read January 9, 1882.)

HAVING carefully examined the different points in the vicinity of the main station, where gold was said to have been found, and as yet being disappointed in not finding an opening among the hummocks that I could call an average section, showing the stratification as visible on a small scale in the several indentations along the shore, I turned eastward, feeling assured from the gradual ascending character of the Island in this direction, and its curvature to the north-east, that I should yet find among the hills