

ERRATA.

Page 271 : for " microscopically " read " macroscopically."

Page 273, 7th line from bottom of page, and in page 275 : for " magnetite " read " magnetyte."

ART. VI.—ARCHÆAN GNEISSES OF THE COBEQUID MOUNTAINS.
—MAGNETIC.—BY REV. D. HONEYMAN, D. C. L.,
F. S. A., &c.

(Read March 14, 1881.)

THE rocks to which attention is directed were first noticed in my second paper on the Geology of the Cobequid Mountains.—Tran. 1873-4, Vol. III, page 385. “South of the County line (Colchester and Cumberland) we have outcrops of the next band. These exposures exhibit much greater variety than was seen on the Intercolonial Railway. In one exposure the strata are beautifully banded. The dark green homogeneous (microscopically) diorites having interbedded red and green gneissoid strata. These exposures show massive homogeneous (microscopically) diorites and others show gneissoid and quartzite strata; and the last exposures, a little below the bridge, on the east side of the road, show dark green diorite, which may readily be mistaken for uncrystalline rock. The hammer, however, shows that it is characteristically hard and crystalline. These are succeeded by uncrystalline rocks on the Intercolonial Railway. The last are the rocks containing the Londonderry Mines iron deposits. The crystalline rocks on the south side of the central band of the I. C. R., I have correlated with the “Lower Arisaig Series”—Laurentian (Archæan).

The special part of the rocks described in the quotation to which I intend to direct attention, is the “Interbedded red and green gneissoid strata.” Specimens of the “red” from a stratum four inches thick were closely examined with a view to satisfying myself regarding the hornblendic character of the dark lines which pervade the red feldspar (orthoclase). Contrary to expectation I found the lines to consist of *magnetite* in grains. A little hornblende and mica also occur. Thinner red strata as well as the green associated, have also grains of magnetite in abundance. The magnet readily and beautifully separates the magnetite from the pulverized rock.

The finding of magnetite in the gneisses *in situ*, led me to

examine the gneissic boulders in my "Boulder Collection."—*Superficial Geology.—Trans. 1876-7.*

In one boulder from the drift of the west side of McNab's Island, Halifax Harbour, I also found grains of magnetite. The specimen has a decided gneissic structure with the lines much contorted, whereas the lines of the specimens already noticed are sub-parallel. The boulder consists of red orthoclase and green hornblende, with a little quartz and mica. Grains of magnetite are scattered throughout. This boulder is, beyond doubt, from the Cobequid gneisses, having travelled at least 65 miles to reach McNab's Island. The proof of this is to be found in the paper cited.

The occurrence of magnetite in these gneisses enables me to indicate precisely the southern limit of the Archæan formation. The associated diorites extend southward to the bridge above Acadia mines. A northern limit point is evidently the north side of Smith's cutting, Wentworth, I. C. R. Here there is a great development of diorites with porphyrites, instead of gneisses of the south side. This gives the whole Archæan, according to the I. C. R. plans and section books, before me, a width of five miles.

OTHER PRE-CARBONIFEROUS FORMATIONS.

These occur on both sides of the Archæan, north and south, in the Intercolonial Railway section.

Although the position of the first on either side and apparent sequence might lead to the supposition that the formations correspond, lithology makes a decided distinction. As neither is fossiliferous, palæontology lends no aid, *pro* or *con*, in the correlation of the two.

The lithology and sequence of the formation on the north, Wentworth, side led me, when I first examined the rocks of the I. C. R. section, to recognise a correspondence with a peculiar formation in the Arisaig Mountains, which had caused considerable perplexity on account of its position and peculiarity. It occupies an intermediate position between the Archæan, which I had designated the "Lower Arisaig Series," and the fossiliferous middle and upper silurian, which I had named the "Upper

Arisaig Series." In my paper on the I. C. R., I compared the formation in question to Professor Ramsay's Snowdon and Cader Idris formation, which it seems strikingly to resemble, and adopted the local designation "Middle Arisaig Series."—*Transactions*.

In my examination of the geology of the Eastern Extension Railway, in its course through the Marshy Hope, I found that the south side of the mountain range had lithological characters corresponding with the Cobequid series, as well as the northern side. This is followed, too, by the "Upper Arisaig Series," *Member A*, of the middle silurian age.—Paper, "Notes on a new Geological Progress Map of Pictou County."—*Transactions* 1879-80.

This led me to consider the mountain formations thus bounded to be of pre-middle silurian—Lower Silurian Age.—*Transactions* 1879-80.

While the Arisaig and Marshy Hope Mountains and the Cobequid Mountains thus possess so much in common as to make their relationship unquestionable; the "middle Arisaig series" of the former differs from the latter in having a predominance of sub-crystalline rocks.

A fossiliferous series succeeds both. The fossiliferous series of the Cobequids is much different from the "A" member of the "Upper Arisaig series." Its lithology is different as well as the palæontology. Its strata are clayey and soft, while the strata of "A" are quartzose—often very hard. Igneous rocks—crypto-crystalline diorites and porphyrites—occur frequently, alternating with soft strata in the one, but not in the other.

The only other formation occurring in Nova Scotia which has anything *like* alternating igneous diorites, are the middle silurian magnetites and associate middle and lower silurian strata of King's, Annapolis, and Digby counties.—*Vide* preceding papers. But even these are much different from the fossiliferous and crystalline rocks of the I. C. R. As I have shown elsewhere the palæontology of the strata in question is of the Cincinnati or Hudson River type, while that of A. was regarded by Salter as intermediate silurian. The Cobequid fossiliferous series thus

seems to make the "Middle Arisaig series" of the Cobequids older than the time to which the Type was referred by the Arisaig and Marshy Hope sequence. The Llandeilo period of British Geology is that to which the supposed equivalent of Prof. Ramsay belongs. The combined width of these two lower silurian series is two miles. The formation on the south side of the Archæan in the Cobequids is that which contains the iron deposits of the Londonderry Mines. This is, as far as known, non-fossiliferous. It has heretofore been correlated with the iron bearing formation of East River, Pictou—middle and upper silurian. There seems to be no sufficient reason why they should not now be so regarded.

The strata of this series have a width of one mile. These are succeeded by strata of the lower and middle carboniferous—having a width of three miles. This sequence might lead to the inference that the iron bearing formation is of Devonian age. The two mixed crystalline series on the north side of the Archæan, are also succeeded by carboniferous strata, having a width of seventeen miles; extending to Northumberland Strait. On the south side, the Triassic formation succeeds the carboniferous. This extends to Cobequid Bay; a distance of 4 miles.

It is quite evident from the above that sequence here can not be regarded as a proof of age.

MEASUREMENTS.

The distance between the Cobequid Bay, N., and Northumberland Strait, N., is.....	32	miles.
The Triassic extends.....	4	"
Carboniferous	3	"
Upper and Middle Silurian	1	"
Archæan	5	"
Lower Silurian	2	"
Carboniferous	17	"

MAGNETITES.

In a collection of rock and mineral specimens, received at the Provincial Museum from the Rev. Donald Sutherland, of Gaba-

rus, Cape Breton, is one specimen which seems to merit special notice.

The weight of the specimen is $2\frac{1}{4}$ lbs. It is an ore of iron, called by Dana *Magnetite*. It very much resembles some of the magnetites of Nictaux. It is evidently part of a bed in metamorphic rocks. The rocks of the region where it is said to have been found are of lower silurian and pre-silurian age (Archæan).

The specific gravity of the Cape Breton magnetite is 4.3

That of Moose River. 3.6

Of Blomidon and Extension rocks. 5.0

The Nictaux and Moose River magnetites are of middle silurian age; of Blomidon, post triassic.

ART. VII.—ON THE DWELLINGS OF THE MUSKRAT AND BEAVER OF NOVA SCOTIA. BY J. BERNARD GILPIN, A.B., M.D., M.R.C.S.

(Read April 11, 1881.)

THE constructive mammals are very few, throughout the world. To say nothing of the burrowers which construct winding holes, or galleries by digging beneath the earth, the most part, are content for a home with what nature gives them; a hollow tree, a den amongst rocks, or a form hollowed by the possessor itself, from the thick grass, is sufficient for their nests, from the strong lion down to the timid hare. And so it was from ancient times, as the bones of the lion and cave bear wrapt with the gnawed relics of their victim, in one stoney mantle, still mark the feasting spot and home of their all but mythic forms. In opposition to this, our Province of Nova Scotia possesses two mammals, each of whom construct dome houses, standing in and out the water still, in our Alpine lakes, and broken streamlets, and which now unseen except by the woodsman, the hunter or Indian, may be readily visited and studied by the naturalist and student. I have thought the members of the Institute would be interested in this paper, in which I have given a few not new facts, but facts old enough, but looked at with new eyes and in perhaps new combinations of scene and climate. The muskrat, (Fiber