Londonderry Iron Mines and I. C. Railway at Blomidon and in the Cobequids we find the rocks *in situ*.

Art. XII.—Notes on the Geology of Bedford, Sackville and Hammond's Plains. By Alfred Hare.

Read May 9, 1881.

During the course of the last Session, I have been engaged in an examination of the rocks of Bedford, Sackville, and Hammond's Plains, on the days that were not class days. I found three formations, namely Archæan, Cambrian and Pleistocene.

1. Archæan.

The Archæan or what is believed to be Archæan, extends from the Birch cove lakes westward, crossing the Margaret's Bay road about three quarters of a mile below Pulsifer's and continues to below Wright's lake, westward to Saint Margaret's Bay. I have not followed it any further. The granite appears to be unstratified. It is very feldspathic ; some of the crystals of feldspar are very large, so that we are quite safe in calling it porphyrytic. I have only traced it so far as Indian River, but it appears to extend much farther.

This formation also extends north-west of Halifax; Pockwock lake being about the most northerly point.

2. (*a*) Cambrian.

This formation includes the gneissoid rocks, quartzites and argillites, it runs close up to the archæan. The gneissoid rocks are the only ones that touch the archæan in this part of the county. It contains *pyrite* in such quantities as to colour the soil in some places where there is a wash from the hills. At this season of the year it forms quite a deposit of iron oxide, so much so as to induce some to search for iron beds north of the gneissoid rocks, the argillites come in and continue much farther north than I have examined ; next to the gneissoid rocks the

argillites appear to be much finer and of a brighter blue than farther away.

North of Wright's lake the strike of the gneissoid strata is north 80° east. At English's corner five or six miles east, the strike is N. 75° E. South-east of Pockwock lake there is a vein of quartz, about four feet and a half wide; here, some years ago, there was a shaft sunk about one hundred and eighty feet deep, in the hope of finding gold, without success.

By pacing the gneissoid rocks I found that they were a mile and a half wide. On account of the quantity of snow in the woods, which obscured them, I could not find out how much farther they extended.

Along the strike the gneissoid rocks extend from Pockwock lake about seven miles to the eastward. They may continue a long distance either east or west, but on account of the snow it was impossible to follow them.

I found a great many quartz veins which were cross leads; most of them were over four inches thick.

There is said to be gold in Hammond's Plains, but not in paying quantities. Thousands of dollars have been spent in sinking shafts, and although I took a great deal of trouble to find out what quantity of gold had been taken out, I did not succeed.

On the hill to the south-east of English's corner, I found a small vein of granite where they had been prospecting for gold; it contains a great quantity of *mica of a gold colour* in curiously wrinkled masses; it also contains *black tourmaline.*

The gneissoid strata are all vertical and very regular; breaks being very scarce.

The essential minerals which I found in the gneissoid strata are quartz, sometimes there is a little mica and feldspar.

The accidental minerals which I discovered were black tourmaline, pyrite and andalusite.

(*b*). Cambrian.

Argillites.—The argillites come in about a quarter of a mile above the road to Hammond's Plains and near the gneissoid strata. They are finer and of a brighter blue than they appear farther

north; as already noticed the argillites do not contain nearly as much *pyrite* as the gneissoid strata. The argillites continue a long distance north, but are covered by the Pleistocene formation. Their dip is vertical. There appears to be more crystals of quartz in the veins of this part of the Cambrian than in the gneissoid strata, but perhaps this may not be the general rule but only the case in this locality.

(*c*). Cambrian.

Quartzites.—The quartzites occupy a large part of the district. The Pleistocene does not cover them as it does the argillites and gneissoid rocks. The dip of the quartzites is about from 18° 22°. The strike differs a great deal, varying from N. 15° E. to N. and S. magnetic. They appear to have been much more disturbed than either the gneissoid rocks or argillites. Faults appear to be very frequent.

Pleistocene.

This formation overlies the Archæan in some places and covers a great part of the Cambrian. It consists largely of granite, syenite, porphyrite, diorite, dolerite and quartzite, amygdaloid, schist, chert and conglomerate boulders.

At Pulsifer's some years ago was found a beautiful hematite, which Dr. Honeyman said had come from the Londonderry Mines, and it has been satisfactorily proved that he was correct, both by the striation and by the boulders accompanying it, which were diorites, syenites and amygdaloids, especially the diorites, which were very hornblendic and contained oligoclase (soda feldspar). One specimen which I found is very beautiful and contained a little mica and pyrite. These, without doubt, came from the Cobequid Mountains.

The specimen of brown hematite has exactly the same streak as the Londonderry iron, and cannot be distinguished from it by any test. The specimen is a very fine one, weighing five pounds and a quarter. It is beautifully crystalized. The structure is mammillary, very compact.

At Indian River, St. Margaret's Bay, I found great quantities of granite which very much resemble syenite. At North-East

River there was a great scarcity of them. All have red feldspar. Overlying the Archæan are great quantities of porphyritic granite boulders, rather darker than the Archæan granite *in situ*.

The amygdaloids have been found westward as far as the School House lake, but not found farther.

PLEISTOCENE.

Striation.—The striation occurs in the gneissoid strata at Pockwock lake. It runs north and south, and N. 35 ° E. It also occurs in the gneissoid strata on the Margaret's Bay road, running north and south and S. 10 ° W. I found it also on the argillites on the Hammond's Plains and Sackville road, running S. 20 E., also on the old Windsor road S. 18 E.; also at Sandy lake, on the Hammond's Plains road, and on the shore south of Bedford, north and south and south and north 10 east. The S. 20 E. line produced north-west passes Blomidon, and cuts a little to the eastward of Cape Sharp, where trap rocks and amygdaloids are *in situ* (Partridge Island and Parrsboro'). The S. 10 ° W. striation produced north-east meets the Wellington station S. 25 W. striation at the Gore. The latter striation produced northerly passes through the Londonderry iron deposits, and the archæan diorites, syenites, etc., of the Cobequids.