

For a number of years the presence of iron ore at Whycogonah in Cape Breton has been well known. The ores, which are magnetites and red hematites, are so very favorably situated, being close to the waters of the Bras d'Or Lake, that a good deal of work was done on them a number of years ago. A number of beds were opened and traced. They varied up to nine feet in thickness, and occurred in the limestone division of the Laurentian, as described by Mr. Fletcher in his numerous reports on the geology of Cape Breton, issued by the Survey. The analyses of the ores were contradictory in character, some being high in phosphorus, while others were very pure and ran high in iron. Last fall fresh discoveries were made in this district some distance from the old openings, of beds of magnetite, some upwards of 100 feet in width. Indications are not wanting that these ores extend over a large tract of country.

The following analysis will serve to show the quality of the ores:—

Silica .....	14.41	
Alumina .....	7.33	
Manganese oxide.....	.61	
Lime .....	3.00	
Sulphur.....	.22	
Metallic iron .....	54.50	
Phosphorus .....	Trace.	
Magnesia .....	Trace.	
Iron. Phosphorus. Sulphur.		
55.70 .....	None. .... .68	
59.60 .....	.16 .....	.23
63.20 .....	.004 .....	.31
54.30 .....	.005 .....	.38
53.20 .....	.38 .....	.25
50.74 .....	.31 .....	.024
53.12 .....	.28 .....	.026
52.85 .....	.0058 .....	.138
<hr/>		
Silica .....	21.05	
Ferric Oxide .....	53.54	
Ferrous Oxide .....	21.24	
Alumina .....	2.26	
Manganese Oxide .....	.50	
Lime.....	1.17	
Magnesia.....	.36	
Sulphur .....	.023	
Phosphorus.....	Trace.	
Metallic Iron .....	54.00	
<hr/>		
Metallic Iron .....	54.36	
Phosphorus.....	.38	
<hr/>		
Silica .....	13.00	
Metallic Iron .....	55.70	
Sulphur .....	.68	
Phosphorus.....	Trace.	

These analyses show that there are ores in this vicinity valuable enough for shipment as regards quality, and the present owners consider that new explorations now being carried on will show that the ore is present in quantities sufficient to warrant working on a large scale. In this connection reference may be made to this division of the Cape Breton Laurentian in which these deposits occur. It may be distinguished as the limestone division, as it is distinguished mineralogically from the other, or felsite division, by the presence of numerous beds of limestone, in addition to the felsites, gneisses, granites, etc., common to both. These limestones furnish marble, as at West Bay and other localities, lime of excellent quality, and dolomites, suitable, as at New Campbellton, for furnace linings. Iron ores occur in them at numerous points both hematite and magnetite. Graphite is also found. In all probability, phosphates similar to those found in Quebec will be proved on search being made. Where these measures are cut by dykes, copper and lead ores carrying gold

and silver occur, and may in some cases prove valuable. As yet, so far as my information goes, free gold has not been found in quartz in the limestone division. The gold of Middle River and Cheticamp appears to be associated with soft talcose and felsitic schists of the other division. This gold occurs at Middle River free in quartz and in the river gravel derived presumably both from the quartz and augmented by gold flakes from the schists. At the Cheticamp River, so far as can be judged from the work done, it would appear to have a similar source, and to be connected only with the felsite series. In the latter case part of the gold may be derived from mineralized zones adjoining the dykes cutting the various rocks. However, the explorations of the coming season will probably give us more exact information. It is interesting to note in connection with the occurrence of gold at Cheticamp that native silver occurs in the Mackenzie River a short distance north, and it is possible that explorations in that section may result in the discovery of important amounts of this metal and associated gold.

THE GREAT LAKES AS A SENSITIVE BAROMETER.\*

BY F. NAPIER DENISON, METEOROLOGICAL SERVICE OF CANADA.

For many years fishermen and sailors upon our great lakes have noticed with interest and curiosity the rapid rise and fall of the water, most marked at the head of shallow lagoons or bays, and have considered it to be an inexplicable phenomenon. While in the vicinity of Lake Huron last summer the writer's attention was attracted by what appeared to be a regular ebb and flow at the mouths of rivers. At Kincardine, by means of a special float, a set of readings was taken, and a variation of level of over three inches observed, averaging nine minutes, that is eighteen minutes for a complete undulation. The weather at the time of observation was fine and excessively hot, but during the night the town was visited by a severe thunderstorm. During the same day at Goderich, a few miles distant, regular undulations of six inches amplitude were reported. From these and other observations, it appeared as if these undulations might be caused in some yet unknown manner by differences of atmospheric pressure upon the surface of the lake.

Upon returning to Toronto and discussing the matter with the Director of the Meteorological Service, he authorized me to proceed with the investigation as part of the regular work of the service, supplying the funds for the construction of such instruments as appeared necessary in a preliminary examination of lake undulations and atmospheric waves. An instrument was set up at the mouth of the Humber River, near Toronto, where ever since most interesting results have been obtained.

The following is a brief description of this instrument: It consists of a recording cylinder placed horizontally, which by means of clockwork completes one revolution every 24 hours. Resting upon this is a self-inking pen attached to an arm which slides freely upon a horizontal guide. This arm is connected by a line to the float, which is enclosed in a special shaft, so constructed as to admit the water only through several small holes; this prevents any sudden movement of the float being caused by local wave motion. As the float rises and falls, the pen correspondingly moves up and down upon the paper, which is revolving at the rate of one inch per hour. The ratio of movement between pen and float is as 1 to 4, so that a rise of one inch of water level corresponds to a movement of one-

\*A paper read before the meeting of the British Association for the Advancement of Science, held in Toronto.