

On September 25 there was quite a disturbance of the needle five hours in advance of the aurora. Just after the appearance of the aurora the current began to weaken and shifted from north to northwest.

On September 26 there was an increased current one hour in advance of the aurora.

On October 8 a westerly current changed to a little south of west one hour in advance of the aurora.

At other times auroras occurred when there was a strong or moderately strong current without apparently having the slightest effect.

NOTE ON AN IMPROVED METHOD FOR OBSERVING GROUND CURRENTS.

Heretofore the best method for observing ground currents has been that of two lines, one in the magnetic meridian and one at right angles to it. By this method the difference of potential between N. and S. and between E. and W. giving the components of the current in these two directions can be obtained. This, however, is not sufficient to enable us to determine the exact direction and strength of the current.

Now, if the difference of potential between N. and W. is taken at the same time as that of N. and S. and of E. and N., there will be all the necessary data to plot the equipotential surfaces, from which the direction of the current can be obtained.

Then, knowing distance between the equipotential surfaces, we can get the variation of the potential with respect to the distance and hence the strength of the current.

The lines need not be at right angles, nor is it necessary that one should be in the magnetic meridian.

II. THICKNESS OF THE ICE.

The thickness of the ice in the lagoon close to the station, and in the still water of the sea near shore, was measured at intervals of about a month during the winter.

The following table presents the results of these observations:

LAGOON ICE.		
Date.	Thickness.	Remarks.
1881.		
November 1	1 0 $\frac{1}{2}$	
1882.		
January 1	3 9	
February 27	5 1 $\frac{1}{2}$	
April 1	6	
May 4	6 2 $\frac{1}{2}$	
SEA ICE.		
December 4	29	Sea ice.
1883.		
January 3	3 8	Measured about 200 yards from shore.
February 2	4 2	
March 7	5 2	
April 2	4 11	
May 2	5 0 $\frac{1}{2}$	
July 1	5	

NOTE.—In the meteorological observations, the readings of the barometer are not reduced to the sea-level.

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