

green pyritous marble.—Vide Transactions, 1870–71, pp. 64. In all probability the Middle Silurian strata of Waters' Hill participated in the pre-carboniferous and post Lower Helderberg movement, which elevated the strata of McLellan's and Irish Mountains; and ~~that they~~ consequently formed part of the Silurian boundaries of the Lower Carboniferous Lagoon, which subsequently became the Pictou coal basin. They evidently formed a barrier on the North against which dashed the waves of the sea throwing up the beach and bar which is now known as the New Glasgow Conglomerate, preserving comparative quiet in the sheet of water within, and affording protection and comfort to the marine Radiata, Mollusca, and Pisces of the period, the Lithostrontia, Crinoidea, Brachiopoda, Lamellibranchiata, Gasteropoda, Heteropoda, Pteropoda, Cephalopoda, and Cochliodus, which have left so many enduring monuments in the beautiful ornamented limestones formed in the inside of the barrier itself,—in the limestones of McLellan's Mountain shore,—in the Gypsum of Irish Mountain,—in the Lithostrontian and other Limestones of Springville, and in the Gypsum, Limestones and marble of East Brook, East River.

---

ART. VII. ON THE METEOROLOGY OF CALEDONIA MINES,  
LITTLE GLACE BAY, CAPE BRETON. BY H. POOLE, ESQ.,  
M. E., *Superintendent of Mines.*

(Read March 11, 1872.)

IN commenting upon the Meteorological phenomena recorded in the accompanying table, which now embraces a period of five years, I would in the first place draw attention to the general results shown during that period.

The mean Barometrical readings corrected to 32° were 29.8428, and corrected for 60 ft. of altitude and force of vapour, 29.6439; and the mean temperature was 40.35. The mean at night being 34.466, and the mean at noon being 46.184 degrees of Fahrenheit.

The mean force of vapour was .2560 inch; and the relative humidity was 73.50, saturation being 100. The mean annual

velocity of the wind was 153,457 miles ; or 17.5 miles per hour. The fall of rain and melted snow averages 58.898 inches on 157 days ; the fall of snow averaging 104.5 inches on 59 days. The nights of frost average 185, or one half of the year. The degrees of frost reckoned from 32 average 1998 degrees. Nights below zero average 7.8 ; rimy frosts average 36.4 ; hail 6.8 ; silver thaws 6.4 ; fogs 45 ; lightning and thunder 11.6 ; rainbows 9.2 ; auroras 54 ; halos round sun 31.4, and halos round moon 8.6 ; corona 3.4 ; wind veered with the sun 37.6 times, and backed 12 times. The average direction of the wind was 126 days from S. to W. ; 105 days from W. to N. ; 76 days from N. to E., and 58 days from E. to S.

Upon comparing the mean of the year 1871 with the average of the 5 years observations, it will be noticed that the barometer read .0513 inch lower ; the thermometer .51 degree lower ; the temperature at night being  $.236^{\circ}$  and at noon being  $.724^{\circ}$ . The force of vapour was .0037 inch less ; and the relative humidity was 4.75 per cent more than the average.

The velocity of the wind is unusually high at this station, and I have therefore thought it desirable to comment upon the gales more in detail, than in former reports.

In January the wind averaged 19.70 miles per hour for the month. The greatest velocity recorded in 24 hours was 1257.60 miles on the 9th. The calmest day was 92.80 miles on the 12th. The first gale began before dawn on the 6th, from S. S. W. with snow and rain ; corrected barometer 29.982 at 2 p. m. Rain ceased at 2 p. m. on the 7th ; wind veered round to W. N. W. and calmed down. The thermometer did not register below 45 degrees during the night of the 6th. The second gale began at 3 p. m. on 9th ; the barometer at 30.081, thermometer  $23^{\circ}$ , and wind N. by E., then N. E. to N., N. W., and W. with snow for the 24 hours. The third gale was on the 25th, W. N. W. The barometer reading 30.067 ; thermometer  $-7^{\circ}$  on 26th ; the wind blew from the N. all day : next day it backed to S. W., W., N. with snow and moderated.

In February the wind averaged 18.14 miles per hour. It was unusually calm on the evening of the 17th. Wind registered 109.6

miles in the 24 hours from S. S. E. The gale came on at night, and at 8 a. m. of the 18th registered 1273.60 miles for the 24 hours previous; wind then S. W. and moderated; the thermometer then at 44°. The barometer fell from 30.122 to 29.260. 1.110 inch of rain fell from 8 p. m. to 8 a. m. of the 18th. Another gale commenced on the 28th at night with wind from N. W., barometer rising up to 30.031, and lowest reading of thermometer at 10°.

On 1st March at 8 a. m., a fine display of parhelia with colored arcs of halos with wind S. S. W., then S. W., S. E., S. S. W., N. W., N. N. W., N. E., to S. S. E., when it fell calm at 6 p. m. on the 2nd. Gale came on again at night of the 3rd from S. W. with rain; changed to N. N. W. at midnight and moderated. The mean velocity of wind for March was 20.09 miles per hour, the highest registered was on the 22nd, 922.4 miles in the 24 hours; the calmest day was the 18th, 144.80 miles. The second gale began at 1 a. m. on the 22nd from the S. E. with rain, then S. W., W. S. W., W., E. Wind calmed at 6 p. m. on the 23rd; only marking 6.20 miles in 14 hours up to 8 a. m. on the 24th. The barometer fell from 30.363 at 9 p. m. on the 20th to 29.157 at 9 p. m. on the 22nd. Between 1 a. m. and noon of the 22nd, 1.39 inch of rain fell.

In April the mean velocity was 18.40 miles per hour. The highest wind was on the 18th, 1272.80 miles in 24 hours. The gale marked 58 miles per hour from 8 a. m. to 6 p. m., N. by E., N., N. by W. 3 inches of snow fell, and barometer read at 2 p. m. 29.391. Gale lasted till 6 p. m. on the 19th. The calmest day was 108 miles on the 14th with wind N. E. Another gale began at night of the 5th from N. E. with snow, it continued all day of the 6th from N. N. E. to N. N. W.; the barometer marked 28.957 at 8 a. m., and the wind gauge registered 68 miles per hour from 8 a. m. to 1 p. m.

In May the wind averaged 17.95 miles per hour. The first gale was on the 20th when the gauge marked 872.80 miles in 24 hours from W. S. W., the barometer reading on the 20th at 8 a. m. 30.091, and on the 21st at 8 a. m. 29.933. The calmest day was the 21st, or 99.20 miles in 24 hours with wind S. S. W. A gale commenced on the 27th with rain and fog from N. W. at

2 a. m. until 5 a. m., with lightning and thunder from 2 to 3 a. m., then snow from 10 a. m. to 4 p. m., with wind from N. N. W., and the gauge registered 44 miles per hour from 8 a. m. to 2 p. m., and 66 miles per hour from 2 till 6 p. m. Half an inch of snow fell, being the last of the season.

In June the wind averaged 12.18 miles per hour. The first gale was on the 5th from the N., and cloudy. On the previous day the wind was brisk and had veered round with the sun; the barometer stood at 29.781 at 2 p. m. on the 4th, 29.610 on the 5th, and 29.790 on the 6th. The wind travelled 970.80 miles in the 24 hours. The next gale was on the 11th and 12th. The barometer stood 30.045 when the gale commenced, weather fine with wind S. by E. to S. S. W., and registered 860 miles for 24 hours up to 8 a. m. on the 12th; the barometer then read 29.793, wind S. S. W. with showers and S. at noon; on the 13th at 8 a. m. the barometer had fallen to 29.454 with rain and wind S. S. W. and registering 1121.20 miles for the 24 hours; later in the day the wind veered to S. W. and moderated.

July was the calmest month; the average being 11.60 miles per hour. The strongest blow on the 2nd only registering 594.40 miles in 24 hours, weather fine, wind S. S. W., and barometer reading from 30.097 to 29.846. The calmest day was the 24th, the register marking 48.60 miles for 24 hours, wind N. N. W., to N. E., and barometer at 30.163.

In August the wind averaged 16.52 miles per hour. There were high winds on the 9th and 30th, being 699.20 miles from S. E., E., and N. E. on the 9th, and 656.00 miles on the 30th from S. S. W.; but neither of them amounted to a gale.

In September the wind averaged 15.32 miles per hour. The calmest day was the 1st, marking 128.60 miles in 24 hours. The strongest wind on the 27th, 668.20 miles, did not amount to a gale; the barometer fell from 30.035 to 29.572 with rain and wind from E. S. E., S., S. W., to W. by N., so that there was not any equinoctial gale.

The wind in October averaged 16.42 miles per hour. On the 7th there was a heavy rain from 10 a. m. to 12 a. m. of the 8th, measuring 1.95 inch, blowing from S. S. W., N. W., N. by E.,

back to N. by W. The barometer fell from 29.859 to 29.616. The next gale began at 8 p. m. of the 12th. The wind had been S. S. W. all day, backed to S. S. E. at night, and next morning was W. S. W.; the total revolutions were 1076.60 miles in the 24 hours, and from 8 to 9 a. m. the gauge marked 64 miles for the hour. The barometer fell from 30.136 at 8 a. m. to 29.391 at 11 p. m.

November was the most stormy month of the year; the wind averaged 22.82 miles per hour. The first storm began on the 2nd, and lasted for three days, and was severely felt at St. John, New Brunswick. The gale blew from W. N. W. with snow, and the gauge marked 797.40 miles at 8 a. m. on the 3rd; wind W. N. W. to N. W., and marked 756.60 miles at 8 a. m. on the 4th; wind backed W. by N. to W., and marked 779.20 miles at 8 a. m. on the 5th. The barometer was at 29.894 on the 1st, and fell to 28.945 at 9 a. m. on the 2nd; stood at 29.325 on the 3rd; 29.424 on the 4th; and 29.414 on the 5th. The second gale began on the 12th and also lasted three days, commencing from the N. N. W. and veering to N. N. E. with rain and snow, the barometer marked 29.329, and gauge registered 1280.80 miles at 8 a. m. on the 13th, when it blew from N. to N. by W., and barometer marked 29.791. At 8 a. m. on the 14th the wind blew from N. by E., and so continued all day, the barometer read 30.046 and the gauge marked 1368 miles. At 8 a. m. on the 15th the wind blew from N.; the barometer stood at 30.088, and the gauge read 680.60 miles for the 24 hours; after which time it moderated with wind veering to N. N. E. and snowing; so that this gale continued with a rising barometer. On the 16th the wind only registered 141 miles for 24 hours blowing from E. N. E., and barometer at 29.882. At 5 p. m. of the 17th the gale sprang up again from N. by E.; the barometer had fallen to 29.596 at 8 a. m., and on the 18th at 8 a. m. it rose to 29.900, and the gauge marked 980.80 miles with wind from N. N. E. On the 19th at 8 a. m. the barometer marked 30.170 wind backed to N. W., and gauge marked 710.80 miles. The next day was calm, marking only 81.20 miles in the 24 hours; barometer 30.187, and wind S. W. by W. On the 22nd the barometer fell from 29.694 at 8 a. m. to

29.136 at 5 p. m., and 1.55 inch of rain fell in 35 hours, the wind blowing S. E., S. S. E., S. and S. S. W. The gauge marked 34.5 miles per hour from 8 a. m. to 1 p. m., 48 miles from 1 to 2 p. m., 73.74 miles per hour from 2 to 5 p. m., and 69.75 miles per hour from 5 to 9 p. m., and 16 miles per hour from 9 p. m. to 8 a. m. on 23rd: total for 24 hours 923.20 miles. The next gale began on the 25th at 10 a. m. The barometer had marked 30.477 on the 24th, and stood at 29.969 at 8 a. m. on the 25th, and fell to 28.856 at 6 p. m., the wind blowing from E. S. E. to E. by S. At 1 p. m. the gauge gave 42.5 miles per hour from 10 a. m. From 1 to 5 p. m. it marked 65 miles; and a total of 1187 miles for 24 hours. Some rain fell, but there was no frost: while at Alta City, Utah, 6 feet of snow fell, and the thermometer marked  $-20$ ; and at Ottawa  $-10$ . The gale continued on the 26th, the wind blowing N. by W., N. N. W. From 8 a. m. to 10 a. m. the wind marked 62 miles per hour; 10 to 11 a. m., 73.6 miles; 11 to 12 a. m., 65 miles; 12 a. m. to 1 p. m., 61.6 miles; 1 to 2 p. m., 69.4 miles; 2 to 4 p. m., 58.3 miles; 4 to 6 p. m., 50.5 miles; 6 to 9 p. m., 39.1 miles, when it moderated, and only read 7.17 miles per hour from 9 p. m. to 8 a. m. on the 27th, the wind veering N., E., S., N. W., N. E. during the day. The total miles being 807.60 for the 24 hours.

In December the average velocity was 17.95 miles per hour. On the 4th the barometer 30.172 with wind S. W. at 8 a. m., backed to S. S. E. and blew 808.40 miles in 24 hours. On the 5th at 8 a. m. the barometer was 29.231, wind S. E. with rain, which measured 1.20 inch from 10 p. m. to 10 a. m. The wind blew 54 miles from 8 to 9 a. m. from S. From 9 a. m. to 1 p. m. 37.5 miles per hour from S. W. Barometer fell to 29.187 at 2 p. m. From 1 p. m. to 8 p. m. 28 miles per hour; and a total of 696 miles for 24 hours. A gale began on the night of the 21st from W. by S. and the barometer had risen to 29.345 from 28.981 at 5 p. m. of the 24th, and the thermometer marked  $-1^{\circ}$  at 8 a. m. of the 22nd, and wind gauge registered 812.80 miles for the 24 hours. On the 24th a gale sprang up at 5 a. m. from S. W., and snow turned to rain; the barometer at 29.646. From 9 a. m. to 12 a. m. it blew 48.20 miles per hour; from 12 a. m. to 2 p. m.

39.5 miles per hour, wind W. S. W.; from 2 to 3 p. m. 62.2 miles per hour. The barometer went up to 30.088 at 8 a. m. on the 25th, and the wind had backed round two whole revolutions during the night of the 24th. On the 27th the barometer was 29.996 at 8 a. m. and fell to 29.175 at 9 p. m. with wind from S. E. to S. S. W. with snow and rain 0.58 inch; wind measured 793.40 miles for the 24 hours.

Of the 40 gales during the year, nine began between South and West, of which five veered, and four backed. Twelve began between the west and north, of which ten veered, and two backed. Four began between north and east and all backed. Nine began between east and south, of which seven veered and two backed. The greatest velocity measured was on the 22nd November from 2 to 5 p. m., averaging 73.74 miles an hour; or from 2 to 9 p. m., the 7 hours averaged 71.47 miles per hour.

The calmest day in the year was the 24th July, when the gauge only registered 48.60 miles in 24 hours; and for the days 23, 24, and 25, they only marked 181 miles, or a rate of 2.5 miles per hour.

During the year the wind made 43 complete revolutions with the sun, and 23 revolutions against the sun, which were recorded by a string fastened to the pedestal as well as to the arrow of the vane. The wind made two turns round with the sun on the 27th May, and made two revolutions backward on the 24th December through the night.

The other notes recorded in the year are :

January 24th.—Sleighs passing over ice, Big Glace Bay Lake.

February 12th.—Two Eagles "*Haliaetus leucocephalus*," seen.  
19th.—Grey gulls and wild ducks.

March 7th.—Four wild geese in the bay. 11th.—Flock of robins. 17th.—Seals seen on ice about 4 miles off.

April 7th.—Heard first greybird singing.

May 1st.—Flock of curlews. 3rd.—Heard woodpecker. 6th.—Gathered mayflowers, "*Epigea repens*," in bloom. 7th.—Cranes, curlews and yellowlegs. 8th.—Herrings and codfish caught in the bay. 9th.—Frogs croaking. 10th.—Frogs piping. 12th.—Saw bee and snake. 13th.—Kingfishers seen. 18th.—Gaspereau passing up Big Glace Bay. 19th.—Swallows seen.

20th.—Musquito hawk heard. Poplar catkins in bloom. 21st.—First butterfly, “Camberwell beauty,” seen. 22nd.—Coltsfoot, violets, strawberries, golden thread, birch catkins bloom. 23rd.—Dandelions bloom.

June 16th.—Apples and plums in blossom. 25th.—Caterpillars on gooseberries. 29th.—First firefly seen.

July 4th.—Wild strawberries ripe. 16th.—Garden strawberries. 19th.—Mackerel caught in herring nets. 23rd.—Gathered peas. 26th.—Mowing hay.

August 3rd.—Dr. How, of Boston, coming from Mabou by stage, saw a very bright Meteor pass through arc of about 30 degs., from 3 to 5 minutes later all the passengers heard a report like a quarry blast. 4th.—Saw a shark in Glace Bay. 13th.—Curlew and plover arrived.

September 15th.—Wild geese in the Bay.

October 9th and 10th.—Country full of smoke from Chicago fire? 29th.—Cock-a-wee, “Harelda glacilis,” in Big Glace Bay.

December 4th.—School of black fish (3 killed) came into Glace Bay. 22nd.—Teams cross ice in Big Glace Bay Lake.

---

ART. VIII. EXTRACT FROM H. S. POOLE'S LETTER, RESPECTING A JOURNEY TO DEEP CREEK VALLEY ON THE NEVADA FRONTIER; 150 MILES FROM SALT LAKE CITY.

(*Read March 11, 1872.*)

WE had to take the same horses and buggy all the way through, as no relays can be got on the way. For the first 50 miles we skirted along the margin of the Great Lake, which in all the southern parts is exceedingly shallow; then we turned south up the Skull Valley, and bid good bye to all signs of civilization. We ascended the Cedar Mountains to the top of a pass 1800 feet above the desert; which seemed to lie at our feet, spread out for 100 miles to the north west, and 45 miles in the opposite direction; and to the left for 20 miles until short ranges of mountains hid its continuations southward.



