

theory of this band implying limited depth at East River is completely untenable.

There is only one other locality in the whole Silurian series, between East River and Merigomish, where there is any indications of the existence of iron ore. Near Sutherland's River, on the road to New Glasgow, I found a boulder of an oxide of iron slightly resembling the Blanchard ore. This was found where rocks occur on the same geological horizon as those including the beds that I have already described.

ART. VII. ON METEOROLOGICAL OBSERVATIONS FOR 1869.  
CALEDONIA MINE, CAPE BRETON. BY HENRY POOLE.

(Read March 14, 1870.)

*January.*—THE barometer ranged from 30.455 inches on the 1st to 29.119 on the 6th; a difference of 1.336 inch. The mean of the month being 29.7182 inches after making corrections for temperature, altitude of 60 feet and force of vapour.

The thermometer ranged from 51 on the 10th to 9 below zero on the 23rd which was the coldest night, and the mean for the day being 4°; the temperature at noon being only 1 degree. The mean for the month was 19.65, and the extreme range 60°.

The relative humidity had a mean per centage of 78.7 saturation, or 100 on the 16th, and 61 on the 28th.

The force of vapour had a mean of 2.7319 millimetres or .1075 inch. The least being 0.65 milli. on the 23rd, (coldest day) and the greatest 8.68 milli. on the 10th, or the hottest day.

The anemometer made 636,500 revolutions in the month, or an average of 17.08 miles an hour. There was a calm for 8 hours on the 3rd, when the anemometer did not revolve. There were high winds on the 6, 7, 10, 17, 20, 21. The strongest on the 20th registered 35360 revolutions, or 707 miles for the 24 hours.

There were 3 days of rain and 8 of snow measuring 12 inches, included when melted in 3.610 inches of rain fall. 3 nights below zero; 29 nights of frost giving 526 degrees of frost; 5 nights of

rimy frost; 2 days of silver thaw, one of hail. No fog, rainbow, or thunder and lightning. One night of aurora; 2 halos round sun, 1 halo round moon; 2 coronæ round moon.

The wind made two revolutions back or against the sun; and the prevailing winds were from S. to W. 10; W. to N. 12; N. to E. 7; E. to S. 2.

First ice made on the 23rd in the bay outside the bar. The mean temperature was 4 degrees milder than in 1868, and one inch less rain fell.

*February.*—The barometer ranged from 30.559 inches on the 26th to 28.886 inches on the 4th; a difference of 1.663 inch. The mean of the month being 29.6804 inches, after making corrections for temperature, altitude and force of vapour.

The thermometer ranged from 1 below zero, on the 15th, to 40 degrees on the 27th. The 15th was the coldest day having a mean of 4 degrees; the temperature at noon being 9. The mean for the month was 23.50 degrees, and the extreme range 41 degrees.

The relative humidity had a mean per centage of 72. Greatest amount of saturation 92 on the 16th. Least amount of moisture 45 per cent. on the 4th.

The force of vapour had a mean of 3.5675 millimetres equal to .1406 inch. The least being 1.38 milli. on the 3rd, and the greatest 6.19 milli. on the 16th, with sleet from E. S. E.

The anemometer made 559320 revolutions in the month, or an average of 16.64 miles an hour. There were high winds on 1, 2, 3, 12, 17, 19, 27. The strongest on the 27th registered 38,700 or 774 miles in the 24 hours. In the forenoon it averaged 40 miles an hour.

There were 3 days of rain and 9 of snow, measuring 22 inches included when melted in the 5.820 inches of rain fall. One night below zero; 27 nights of frost, giving 374 degrees of frost. 4 nights of rimy frost, 2 of hail, 2 of silver thaw, one day of fog. No lightning or rainbows, 5 times northern lights, 2, 3, 10, 14, 18. 3 halos round the sun, and 2 round the moon.

The wind made 3 turns with the sun, and 2 against the sun. The prevailing winds were S. to W. 7, W. to N. 9, N. to E. 7, E. to S. 5. Heard a greybird singing on the 18th.

*March.*—The barometer ranged from 30.505 inches on the 23rd to 29.004 inches on the 22nd; a difference of 1.401 inch. The mean of the month being 29.7547 inches, after making corrections for temperature, altitude and force of vapour.

The thermometer ranged from 46° on the 11th to 4° below zero on the 6th, which was the coldest day of the month, the mean being 4.5 degrees, the temperature at noon being 13 degrees. The mean for the month was 23.60 degrees, and the extreme range 50 degrees.

The relative humidity had a mean per centage of 68. Greatest amount of saturation 88 on the 27th. Least amount of moisture 46 per cent. on the 22nd.

The force of vapour had a mean of 3.9680 millimetres, equal to .1561 inch. The least being 1.56 milli. on the 6th, the coldest day; the greatest being 7.13 milli. on the 11th, when a gale of wind was blowing from the north.

The anemometer made 711,000 revolutions in the month, or an average of 19.11 miles an hour. There were gales on 1, 5, 7, 10, 11, 19, 20, 21, 23, 27. The strongest on the 1st registered 1257 miles in the 24 hours.

There were 2 days of rain and 10 of snow measuring 26½ inches included when melted in the 6.005 inches of rain. Two nights below zero; every night frost, giving 507 degrees of frost. 7 nights of rimy frost, a silver thaw on 13th, one of hail, no fog, lightning or rainbows. 5 times northern lights on 8, 9, 13, 17 and 19; and 6 halos round the sun.

The wind made two revolutions with the sun, and the prevailing winds were from S. to W. 7, W. to N. 14, N. to E. 5, and E. to S. 5.

Wild geese at Lingan on 15th; drift ice jambed on shore on the 19th.

*April.*—The barometer ranged from 30.181 inches on the 24th, to 29.305 inches on the 26th, a difference of .876 inch. The mean of the month being 29.5288 inches after making corrections for temperature, altitude and force of vapour.

The thermometer ranged from 22 degrees on the 12th to 62 degrees on the 21st. The 14th was the coldest day, having a mean of 28 degrees. The hottest days were 21st and 22nd,

having a mean of 46.5 degrees. The extreme range was 40 degrees from 22 to 62.

The relative humidity had a mean per centage of 70.3. Greatest amount of saturation 92 on the 1st. Least amount of moisture 32 on the 28th.

The force of vapour had a mean 5.7716 millimetres, equal to .2273 inch. The least being 2.71 milli. on the 28th, and the greatest 10.08 milli. on the 21st at noon, followed by rain at 5 p. m. from S. S. W.

The anemometer made 637,800 revolutions in the month, or an average of 17.72 miles an hour. There were high winds on 10, 14, 15, 21 and 23. The strongest on the 15th registered 61,600 or 1026 miles in the 24 hours, or 50 miles an hour.

There were 5 days of rain and 8 days of snow, measuring 19 inches included when melted in the 4.420 inches of rain fall. 29 nights of frost, giving 103 degrees of frost; 2 nights of rimy frost; one of hail on the 29th; one of silver thaw; 8 times of fog. No lightning or rainbows; 4 times auroras, 2, 11, 12, 16; two halos round the sun.

The wind made 3 turns with the sun, and one turn against the sun. The prevailing winds from S. to W. 6, W. to N. 11, N. to E. 10 and E. to S. 3. First robin seen on the 8th. Frog piped on the 19th. 22nd, first vessel arrived at Port Caledonia. On 27th drift ice passing south.

*May.*—The barometer ranged from 30.059 inches on the 31st, to 29.059 inches on the 20th; a difference of 1 inch. The mean of the month being 29.5377 inches after making corrections for temperature, altitude and force of vapour.

The thermometer ranged from 25 degrees on the 1st, to 63 degrees on the 24th. The mean being 40.15 degrees. The coldest day was the 1st, with a mean of 31.5 degrees, and the extreme range was 38 degrees.

The relative humidity had a mean per centage of 69.6. Greatest amount of saturation 91, on the 18th. Least amount of moisture 30 per cent. on the 30th.

The force of vapour had a mean of 5.7167 millimetres, equal to .2273 inch. The least being 2.70 milli. on the 1st, after the coldest night. The greatest being 9.58 milli. on the 26th.

The anemometer made 632,320 revolutions in the month, or an average of 17 miles an hour. There were high winds on the 1st, 2nd, 3rd and 27th; the strongest, 694 miles in the 24 hours on the 27th.

There were 13 days of rain (of which two were snowy, measuring one inch) measuring 7.400 inches. 11 nights of frost, giving 25 degrees of frost. Two nights of rimy frost, one of hail on the 10th; 15 times fog; no lightning or rainbows. 4 auroras on the 8th, in a long waving curtain, 10th, 13th and 29th. 6 halos round the sun; one round the moon at 10 p. m. on the 19th.

The wind made 4 revolutions with the sun, and the prevailing winds were S. to W. 4, W. to N. 10, N. to E. 11, and E. to S. 6. Drift ice jambed into the bay on the 2nd; gathered mayflowers in bloom on the 2nd. White coltsfoot, (*Nardosmia palmata*), on the 9th. Dandelion on the 28th, (*Leontodon autumnalia*.) Cod and herrings caught on the 8th. Saw butterfly on the 11th, and heard "yellow-leg" plover. On 12th saw a spotted brown snake 2 feet long. Swallows on 23rd. 25th, Gaspereau running up Big Glace Bay brook.

*June.*—The barometer ranged from 29.630 on the 16th to 30.115 inches on the 23rd; a difference of .485 inch. The mean of the month being 29.5950 inches after making corrections for temperature, altitude and force of vapour.

The thermometer ranged from 76 degrees on the 6th, to 38 degrees on the 10th, which was the coldest day; being 45 degrees at noon, and a mean of 41.5 degrees. The 6th was the hottest day, having a mean of 65 degrees. The mean for the month was 54.3 degrees, and the extreme range was 38 degrees.

The relative humidity had a mean per centage of 64.9. Greatest amount of saturation 90 on the 23rd. Least amount of moisture 37 on the 28th.

The force of vapour had a mean of 8.9264 millimetres, equal to .3512 inch. The least being 5.42 milli. on the 12th, the greatest being 14.98 milli. on the 25th; the thermometer being 22.8 cen. at 8 a. m.

The anemometer made 577,640 revolutions in the month, or an average of 16 miles an hour. There were high winds on the 9th, 10th, 14th and 15th, the strongest wind was on the 9th, registering 771 miles in the 24 hours.

There was not any snow or frost; eleven days of rain measuring 3.330 inches. 4 times of fog on 1st, 5th, 6th and 23rd. Lightning and thunder on the 23rd and 29th. Auroras on the 12th and 18th. 3 halos round sun.

The wind made 6 revolutions with the sun, and the prevailing winds were from S. to W. 14, W. to N. 7, N. to E. 4, E. to S. 5. Heard mosquito hawks on the 3rd. Saw swallow-tailed butterfly on the 15th.

*July.*—The barometer ranged from 30.087 inches on the 20th, to 29.230 inches on the 1st; a difference of .857 inch. The mean of the month being 29.4164 inches after making corrections for temperature, altitude and force of vapour.

The thermometer ranged from 43 degrees on the 6th, to 86 degrees on the 29th. The mean being 59.80 degrees. The coldest day was the 1st, with a mean of 47.5 degrees. The hottest day was the 29th with a mean of 84 degrees, and the extreme range was 43 degrees.

The relative humidity had a mean per centage of 65.9. Greatest amount of saturation 84 on the 4th. Least amount of moisture 44 on the 14th.

The force of vapour had a mean of 11.5191 millimetres, equal to .4535 inch. The least being 7.49 milli. on the 2nd, after the coldest morning. The greatest being 17.31 milli. on the 28th, with the thermometer standing at 82 degrees.

The anemometer made 539,570 revolutions in the month, or an average of 13.67 miles an hour. There was a gale on the night of the 1st with hail, reported by the pilots; also on the 11th and 16th. The strongest was on the 11th, registering 652 miles in the 24 hours.

There were 8 days of rain, measuring 6.400 inches. No frost or snow. 2 days it hailed. Fog on the 4th and 9th. Lightning and thunder on the 7th, 16th and 23rd. A rainbow on the 7th. Faint aurora on the 18th.

The wind made two revolutions with the sun; and the prevailing winds were S. to W. 18, W. to N. 4, N. to E. 6, E. to S. 3. Fireflies seen on the 3rd.

*August.*—The barometer ranged from 30.245, on the 1st, to 29.501 inches on the 27th; a difference of .744 inch. The mean

of the month being 29.5107 inches after making corrections for temperature, altitude and force of vapour.

The thermometer ranged from 78 degrees on the 5th to 42 degrees on the 18th. The mean being 61.33 degrees. The coldest day was the 20th with a mean of 53 degrees; the hottest day was the 5th with a mean of 69 degrees. The extreme range was 36 degrees.

The relative humidity had a mean per centage of 67.65. Greatest amount of saturation 87 on the 6th. Least amount of moisture 48 on the 13th.

The force of vapour had a mean of 10.659 millimetres, equal to .4197 inch. The least being 7.35 milli. on the 24th, being the coldest day at noon. The greatest being 14.60 milli. on the 5th, or the hottest day.

The anemometer made 472,540 revolutions in the month, or an average of 12.7 miles an hour. There were not any high winds during this month, 542 miles in the 24 hours on the 3rd being the highest registered.

There were 11 days of rain, measuring 2.725 inches. No frost, snow, hail, or fog. Lightning and thunder, 5 to 6 p. m., on the 31st. A triple rainbow at 6 p. m. on the 27th. Also rainbow 3 p. m. on the 31st. Auroras on the 1st, 5th, 6th, 8th and 28th. One halo round the sun. One corona round the moon on the 18th.

The wind made 4 revolutions with the sun, the prevailing winds S. to W. 9, W. to N. 8, N. to E. 5, E. to S. 9.

Flock of black ducks on lake, 3rd. Eclipse of sun, not well seen, at 6 p. m. on the 7th. Curlew seen on the 24th.

*September.*—The barometer ranged from 30.343 on the 18th, to 29.683 inches on the 20th; a difference of .660 inch. The mean of the month 29.6183 inches after making corrections for temperature, altitude and force of vapour.

The thermometer ranged from 78 degrees on the 8th to 38 degrees on the 23rd. The mean being 56.95 degrees. The hottest day was the 9th, the mean being 73 degrees, (the night not falling below 69 and the day 77 degrees.) The coldest day was the 29th, with a mean of 45.5 degrees. The extreme range being 40 degrees.

The relative humidity had a mean per centage of 71.2. Greatest amount of saturation 92 on the 21st. Least amount of moisture 44 on the 6th.

The force of vapour had a mean of 10.481 millimetres, equal to .4130 inch. The least being 6.09 milli. on the 22nd, or the morning before the coldest day. The greatest being 18.18 milli. on the 9th, the thermometer being at 77 degrees.

The anemometer made 562,730 revolutions in the month, or an average of 15.63 miles an hour. There was a gale on the nights of the 2nd, 16th, 20th, 21st and 28th. The strongest was on the 20th, or 820 miles in the 24 hours.

There were 8 days of rain measuring 2.870 inches. Three nights of hoar frost, on the 19th, 23rd and 29th. No snow, hail, lightning or thunder. Fog on the mornings of the 9th and 27th. Auroras on the 1st, 3rd, 5th, 9th, 11th, 25th and 28th. Halo round the sun on 13th.

The wind made 5 revolutions with the sun, and none against it; the prevailing winds S. to W. 14, W. to N. 4, N. to E. 9, E. to S. 3. Wild geese in the Bay on the 18th.

Coliseum, Boston, blown down on the 7th when we had only a moderate breeze, 226 miles in the 24 hours.

*October.*—The barometer ranged from 30.256 inches on the 2nd to 28.927 inches on the 27th; a difference of 1.329 inch. The mean of the month being 29.6430 inches, after making corrections for temperature, altitude and force of vapour.

The thermometer ranged from 75 degrees on the 4th to 22 degrees on the 29th. The mean being 48.55 degrees. The coldest day was the 29th, with a mean of 29.5 degrees. The hottest day was the 4th, with a mean of 66 degrees, and the extreme range was 53 degrees.

The relative humidity had a mean per centage of 75.5. Greatest amount of saturation on the 16th and 19th, being 91. Least amount of moisture 47 on the 1st.

The force of vapour had a mean of 8.2809 millimetres, equal to .3260 inch. The least being 4.18 milli. on the 29th, or the coldest morning. The greatest being 14.24 milli. on the 5th, when the day had a mean temperature of 63.5 degrees.

The anemometer made 678,320 revolutions in the month, or an



average of 18.04 miles an hour. There was gale began at 7 p. m. on the 4th, lasted two days from S. W. and S. ; on the 11th, 16th, 17th, 24th and 27th from E. N. E. to N. and N. W. ; the guage registered 66 miles an hour for 15 hours, and a total of 1360 miles for the 24 hours ; this was the highest wind marked for the whole year.

There were 14 days of rain and snow mixed together, measuring 3 inches of snow, melting as it fell, and 7.220 inches of rain and melted snow. 9 nights of frost, and 15 degrees below  $32^{\circ}$  ; 5 nights of rimy frost ; 3 fogs on 13th, 16th and 17th. No hail, or lightning and thunder. Rainbows on the 5th, 7th and 28th : the latter might be called a *Snow-bow*, for it had not the prismatic colours, and it appeared double the width of ordinary rainbows. Auroras on the 2nd, 3rd, 5th and 9th.

The wind made 3 revolutions with the sun, and one against the sun on the 13th. The principal winds were S. to W. 11, W. to N. 8, N. to E. 4, and E. to S. 8. Earthquake felt at 6 a. m. at Arichat, Halifax, Windsor, State of Maine. San Francisco, on the 13th.

*November.*—The barometer ranged from 29.156 inches on the 8th to 30.539 inches on the 20th ; a difference of 1.383 inch. The mean of the month being 29.6878 inches after making corrections for temperature, altitude and force of vapour.

The thermometer ranged from 53 degrees on the 6th to 22 degrees on the 20th. The mean being 37.45 degrees. The warmest day was the 6th, with a mean of 49.5 degrees ; the coldest day was the 20th, with a mean of 31 degrees, and the extreme range was 31 degrees.

The relative humidity had a mean per centage of 77.74. Greatest amount of saturation 93 on the 28th. Least amount of moisture 62 on the 10th and 12th.

The force of vapour had a mean of 5.8395 millimetres, equal to .2299 inch. The greatest being 10.19 milli. on the 22nd, and the least being, on the 30th, 2.91 millimetres, or the coldest day at 8 a. m.

The anemometer made 635,180 revolutions in the month, or an average of 17.64 miles an hour. There was a gale on the 15th, 17th, 20th, 21st, 28th and 29th. Each of these gales lasted about two days ; the heaviest was on the 21st, equal to 1065 miles in the

24 hours, from S. and S. E. The aneroid metallique marked 7800 millimetres, or 30.709 inches on the 20th, (12 hours before the gale.)

There were 12 days of rain and 3 of snow (depth 1 inch) which measured 5.065 inches. 22 nights of frost, and 47 degrees of frost; 3 fogs on 5th, 21st and 22nd. One aurora on the 8th. Halo round sun on 24th and 30th.

The wind made 3 revolutions with the sun, and 2 against the sun. The principal winds were S. to W. 11, W. to N. 9, N. to E. 7, and E. to S. 3.

*December.*—The barometer ranged from 29.260 inches on the 1st to 30.590 inches on the 11th; a difference of 1.330 inch. The mean of the month was 29.8990 inches, after making corrections for temperature, altitude and force of vapour.

The thermometer ranged from 55 degrees on the 1st to 15 degrees on the 25th. The mean being 30 degrees. The coldest day was the 4th, with a mean of 20 degrees; the hottest day was the 29th, with a mean of 47 degrees, and the extreme range was 40 degrees.

The relative humidity had a per centage of 76, and greatest amount of saturation 96 on the 23rd. Least amount of moisture 44 on the 25th.

The force of vapour had a mean of 4.7245 millimetres, equal to .1860 inch. The least being 194 milli. on the 4th, and the greatest being 9.61 milli. on the 1st, which was the warmest day at noon.

The anemometer made 713,210 revolutions in the month, or an average of 19.17 miles an hour, being the most windy month in the year, and a little in excess of March. There were gales on the 1st, 3rd, 7th, 14th, 15th, 18th, 19th. The greatest gale was on the 3rd, making 1010 miles in the 24 hours. On 19th gale marked 59 miles an hour, from 9 a. m. to 1 p. m.

There were 15 days of rain, including 75 inches of snow on 6 days, measuring 5.655 inches. 25 nights of frost, and 197 degrees of frost. 6 nights of rimy frost. 4 fogs on 7th, 27th, 28th and 29th. Rainbows on the 18th until 11 a. m. One halo round sun, and 2 halos round moon. No auroras observed.

The wind made 1 revolution with the sun, and 1 revolution against the sun. The principal winds were S. to W. 13, W. to N. 8, N. to E. 6, E. to S. 4.

