

excellent for the *growth* of oysters; they grow in such localities very quickly, and become saleable in a comparatively short space of time; and this is the kind of soil that is so productive at Ile de Re and at Arcachon. Dry rocky ground is not so suitable for the young oyster, as it does not find a sufficiency of food upon it, and consequently languishes and dies. Marl is the most esteemed, as the oyster finds plenty of food, constant heat, and perfect quiet.

Whether oyster-culture may be successfully practised in Nova Scotia is a question that I have not treated upon, but it is worth a trial; it has done much, very much for the poor fishermen of France, having placed upon the shores of that country 7000 marine farms, affording employment to a very large proportion of the population.

ART. VI. ON THE METEOROLOGY OF THE CALEDONIA COAL MINE, LITTLE GLACE BAY, CAPE BRETON, IN 1867. BY HENRY POOLE.

(Read February 3, 1868.)

THE Caledonia Mine is situated in the County of Cape Breton and Province of Nova Scotia, in North America, latitude $46^{\circ} 12'$ north, and longitude $59^{\circ} 57'$ west from Greenwich.

It is on the eastern side of the Island, about one mile distant from the shore, and the house at which the observations have been recorded is at an elevation of sixty feet above the sea.

The tides have an average rise and fall of four feet. There are no high lands in the neighbourhood. The land extends from the east by south round to the north-west, while from the north and east the influences of the Atlantic storms and currents are felt in full force. Drift ice retarding the vegetation of spring, and the Arctic currents lowering the normal temperature of summer and autumn; while the higher temperature of the sea, and perhaps a partial influence of the Gulf Stream, keeps a milder temperature in the early part of winter, and our Bay open for navigation much longer than I have observed at Pictou and other places in the same latitude but further removed from the ocean's influence.

The instruments used are a barometer with fixed ivory pointer in a glass cup, to which the surface of the mercury is adjusted, made by Green, of New York, Instrument maker for the Smithsonian Institute. Mercurial thermometers to show the day's temperature in Fahrenheit, and two thermometers graduated in centigrade degrees for showing the relative humidity and force of vapour, also made by Green. A horizontal spirit thermometer made by Negretti, registers the extreme temperature at night; these thermometers are placed on the outside of the house with a N. E. aspect, 6 feet above the ground, and about three inches distant from the wall. The directions of the wind are true north, &c., and not magnetic, (the variation of the needle being N. 25° W. at the present time). The velocity of the wind is recorded by one of Negretti and Lambra's Cup Anemometers, calculating 1000 revolutions to equal a mile. The greatest velocity observed was on the 13th December, 34740 revolutions for 12 hours, equal to 58 miles an hour, and the calmest night was 24th November, when there were only 277 revolutions in 15 hours, equal to 3 6-10 miles an hour. The force of the wind is also shown by a board one foot square, made to face the wind, and acting against a spring Salter's balance. It therefore shows the extreme force of any squall; but as there is a good deal of friction the machine is not acted upon by very light winds. On the 17th January, during the night it marked 44 lbs., being the extreme limit marked on the machine. On the 3rd August a gale from the west marked 40 lbs. pressure on the square foot, and equalled a velocity for 6 hours of 53 miles an hour.

The rain is measured by a square zinc box placed on the ground, with a funnelled mouth ten inches above the ground. The snow is collected in a zinc pail three feet deep, hung like a ship's compass, at five feet from the ground, so that drifted snow does not blow in; and when melted is included in the total quantity of rain recorded to have fallen in each month.

A meteorological register was kept at the Albion Mines for eleven years; and though only one year has been kept at present at the Caledonia Mine, I have thought it would be interesting to compare them together.

METEOROLOGICAL REGISTER, CALEDONIA COAL MINE, LITTLE GLACE BAY, CAPE BRETON, 60FT. ABOVE SEA, LATITUDE 46° 12' N., LONGITUDE 59° 57' W.

1867.	BAROMETER CORRECTED.				THERMOMETER.					Relative Humidity.	Force of Vapour Millimetric.	Degrees of Frost below 32.	Nights of Frost.	Below Zero.	RAIN.		SNOW.		Wind total Revolutions.	Miles per hour anemometer.	Extreme pounds pr. foot square.	Least Revolutions in 12 hrs. pr. anemometer.	Greatest Revolutions in 12 hrs. pr. anemometer.	HALOS.		Northern Lights.	Lightning, Thunder.	Fogs.	Wind round with Sun.	Wind round against Sun.	Silver Thaw.	Rainbows.	WIND.				
	Temp. reduced to 32°.	For height 166 ft. 060 -F. of Vap.	Highest.	Lowest.	Mean night.	Mean Noon.	Mean.	Coldest.	Hottest.						Days.	Inches.	Days.	Inches.						Sun.	Moon.								S. to W.	W. to N.	N. to E.	E. to S.	
January.....	29.600	29.551	30.235	28.900	19.0	26.0	22.5	-10	37	76.6	2.77	392	31	2	9	5.915	9	44	758644	20.4	44	606	32782	..	..	..	..	2	2	2	..	..	8	12	5	6
February.....	29.884	29.825	30.768	29.285	16.7	27.0	21.5	-5	50	75.0	3.02	454	26	2	12	3.395	7	10 1/4	802678	23.6	20	4260	26052	1	1	..	1	8	14	4	2
March.....	29.903	29.849	30.527	28.791	17.1	29.5	23.3	-2	44	73.1	2.90	465	30	1	11	5.965	9	16 3/4	659698	17.7	9	1088	23594	2	..	3	..	..	3	1	..	..	3	12	8	8
April.....	29.806	29.704	30.299	29.092	26.9	40.3	33.6	19	57	75.3	4.13	129	27	..	15	5.085	9	15 1/4	615098	17.0	12	924	23570	2	..	1	1	2	2	2	2	7	9	3	11
May.....	29.867	29.681	30.358	29.364	37.0	49.2	43.1	24	71	74.3	6.26	16	5	..	14	5.370	1	2	629463	16.9	7	457	27299	2	..	3	..	3	5	2	..	..	6	10	6	9
June.....	29.969	29.726	30.322	29.590	47.2	60.8	54.0	32	78	58.6	7.716	..	1	..	12	2.010	"	"	619496	17.2	14	940	22575	2	..	1	1	2	3	1	..	..	11	10	7	2
July.....	29.834	29.477	30.283	29.376	53.5	66.7	60.1	43	80	71.7	10.578	..	..	..	13	3.080	"	"	540656	14.5	3	2174	15960	1	..	..	3	4	5	2	..	..	11	8	6	6
August.....	29.950	29.481	30.322	29.644	58.6	74.7	66.6	45	85	65.3	13.454	..	..	..	7	2.560	"	"	535202	14.4	40	1262	21954	1	..	7	..	4	5	..	..	15	5	1	10	
September.....	29.954	29.653	30.289	28.676	49.9	62.3	56.1	36	75	72.6	9.697	..	..	..	11	11.265	"	"	592640	16.4	7	626	22200	2	..	9	2	3	5	1	..	..	12	8	4	6
October.....	29.913	29.736	30.500	29.150	39.0	50.0	44.5	28	63	73.0	6.001	12	7	..	11	2.920	1	"	665252	17.8	10	600	22615	2	2	1	1	1	3	2	..	3	11	11	4	5	
November.....	29.812	29.671	30.279	29.064	31.5	40.6	36.0	15	59	79.4	5.095	125	14	..	16	4.780	3	9 3/4	613918	17.0	9	277	33110	1	..	1	..	3	1	..	..	14	10	2	4	
December.....	29.737	29.691	30.369	28.912	13.7	24.4	19.1	-4	43	79.5	2.705	578	31	2	16	5.745	13	27 1/4	689670	18.5	12	2564	34740	..	1	..	1	1	1	4	2	16	5	4	6
Extreme....			30.768	28.676				-10	85		In. 2438	2171	172	7	147	58.090	52	Ft. in. 9.3 1/2	7722414	17.6	44	277	34740	16	3	26	9	25	36	17	5	6	122	114	54	75	
Mean	29.8524	29.6704			34.17	45.95	40.06			72.87	6.194								154448 Miles																		

CLIMATE OF THE ALBION MINES, NOVA SCOTIA, LATITUDE 45° 34' 30" N. LONGITUDE 62° 42' W.. FROM GREENWICH, 120FT. ABOVE SEA.

10 years ..	29.7137	30.757	28.505	33.11	50.91	41.97	-22	98	2470	189	19	173	44.967	63	Ft. in. 10.5	19	112	126	66	61
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The barometrical readings have nothing marked to distinguish the one locality from the other; and the same characteristic is observed here of a rapid rise or fall following each other within a few hours; which is not the case in England as recorded by Howard's Climate of London.

The mean temperature here 40.06 Fah. is about two degrees colder than at the Albion Mines, 41.97. The mean difference of the days being five degrees colder, and the nights one degree warmer. The most marked difference being 6.82 in January, and 5.75 in February, warmer at night at the Caledonia Mine; which also accounts for the difference in the total degrees of frost below 32, Caledonia being 2171, and Albion Mines being 2470 degrees of frost for the year. August and September are slightly in excess of mean temperature, and also for the nights in October and November, showing that the frosts keep off longer, and that grains and vegetables would ripen here also, if the farmers only paid proper attention to draining and cultivation.

The relative humidity and force of vapour were not tabulated at the Albion Mines, so no comparison has been made, but an average per centage of 72.87 of humidity, with a force of vapour so high as is shown in June, July, August and September, shew very favourably for rapid vegetation.

The extremes of temperature are much greater at the Albion Mines than at the Caledonia, the former ranging 120 degrees, or from 98 to 22 below zero, the latter ranging only 95 degrees, or from 85 to 10 below zero. At the Albion Mines the average of nights below zero was 19, while at the Caledonia Mine in 1867, there were only 7. There were more rainy days (173) at the Albion Mines, giving 44.967 inches, than at the Caledonia (147) giving 58.090 inches; but it will be observed that the quantity was in excess 13.123 inches at Caledonia Mine. June was the driest, and September the wettest month.

There was not any frost in July, August or September, while at the Albion Mines on an average there was frost every other year on one night in July, August, and for five nights in every September.

There was fewer days of snow (52) at the Caledonia Mine,

measuring 10 feet 5 inches, than at the Albion Mines (63 days) measuring 9 feet 3½ inches, and the snow was not so dry at Caledonia, yielding more water, owing no doubt to the proximity and influence of the ocean.

There is not much difference in the direction of the winds:—

Caledonia Mine—S. to W. 122, W. to N. 114, N. to E. 54, E. to S. 75.

Albion Mine—S. to W. 112, W. to N. 126, N. to E. 66, E. to S. 61.

No registering instrument was kept at the Albion Mines of the daily velocity; but I consider the wind must be above the average velocity at the Caledonia Mine, and I should like my register to be compared, if possible, with the one kept at the Citadel Hill, Halifax, or other places having nearly the same latitude.

The mean temperature of December was the coldest in 1867, but that I think was exceptional, as December 1866 was four degrees warmer. I therefore assume December, January, February and March nearly alike, and average about 22 degrees; April and November nearly correspond, and are about 12 degrees warmer; May and October are about the same and 9 degrees warmer; June and September are again about 11 degrees warmer; July 6 degrees warmer than June; and August 6 degrees warmer than July, and 10 degrees warmer than September. September has a mean of 56 degrees, which corresponds with the temperature of the whole year at Vienne, in France, in nearly the same latitude but on the opposite side of the Atlantic.

The length of the longest day is 15 hours and 23 minutes, and of the shortest day 8 hours and 37 minutes.

The greatest range of temperature for the whole year was 95 degrees; for one month (February) 55 degrees; the least range in one month (October) 35 degrees.

As a good deal has been written about the veering of the wind and rotation of storms, I fastened a string to the wind-gauge, and found that it made thirty-six coils turning round with the sun, and seventeen coils turning back against the sun,

during the course of the year. There does not appear to be any regularity or uniformity either in direction or time. In January the wind backed on the 17th, and a gale from S. E. on the 18th marked a pressure of 44 lbs per square foot. On the 21st the wind went round with the sun, and a gale from E. and N. lasted for the next three days. Another gale on the 30th was from the N. W. In February the wind was high all the month; the heaviest gale on the 10th and 11th began from S. W. and S., then went to N. W., and the wind made one entire revolution with the sun during the whole month. In March there was not any very heavy gale, only high wind on the 2nd from the S. with rain, on the 18th from N. W. with snow, and on the 27th from S. E. with mist, after which the wind went round against the sun. On the 17th April the wind backed from E. N. E. to E. S. E. and blew for three days, with snow and sleet, producing a silver thaw. On the 2nd May a gale with rain from S. S. W. On the 18th wind round with the sun from N. to E., blew a gale all the 19th from the north, and lobsters and codfish driven on shore in large numbers. On the 4th June a snow storm with wind from the west; 5 feet of snow fell between Cape North and Grandance; on the 19th a gale from W. S. W. with light showers of rain. In July the highest winds were on the 1st from the west, and on the 29th from the S. W., but neither of them amounted to a gale. On the 3rd August a gale from the S. W. blew down trees, and the dry wind blasted the leaves of many plants, and withered them. On the night of the 1st September, with high wind from S., rain measured from 6 p. m. to 8 a. m. on the 2nd, or fourteen hours, the unusual quantity of 4 33-100 inches. On the 30th a gale from S. E. all day with lightning and thunder, and continued on the 1st October from the S. W. High wind on the 6th from S. E. with rain, and on the 26th from north with rain. On the 2d and 3d November with squalls of rain from W. N. W.; on the 13th gale from S. S. E.; on the 16th from the S. E.; and on the 30th from S. E. then S. with three quarters of an inch of rain. On the 14th December a snow storm from the north blew 68230 revolutions in the 24 hours, equal to a velocity of 1364 miles; or at a rate of 56.8 miles per hour. There was also a

gale from the S. E. on the night of the 27th, accompanied with lightning and thunder.

On the 15th February the first drift ice was seen passing to the south.

On the 10th March very fine Aurora Borealis, showing five lines of curtains, one above the other at 8 p. m., colored, and extending from Corna Berenicis to Capella.

March 29th, heard blue birds singing,—28th ice left the Bay.

April 10th, saw a small butterfly, heard robins,—12th, first herrings caught in the Bay,—16th, frogs heard.

May 6th, saw first bee,—13th, first snake, brown,—16th, first swallows.

June 4th, heard musquito hawks,—5th, dandelion in bloom,—9th, heard a loon,—12th, saw swallow tailed butterfly,—13th, blue butterfly and Camberwell beauty.

July 8th, fireflies,—14th, bat,—19th, gathered mushrooms.

August 6th, flight of winged ants,—20th, curlew and plover arrived.

October 22nd, saw a glowworm by side of the road.

November 5th, tide ebbed and flowed four times.

December 8th, “cock-a-wies (*anas glacialis*) in the Bay; they remain here all winter, and go north in spring,—11th, wild geese last seen in the bay,—31st was the coldest day in the year, when the thermometer marked 4 below zero at night, and only 1 degree above zero at noon. Shocks of earthquake were felt throughout the State of New York; the barometer on the 1st January, 1868, stood at 30.53, with thermometer attached, at 42; and on the 2nd January, barometer 28.97, with thermometer attached 50, showing a fall of 1.56 inch of pressure in 24 hours, and though occurring in 1868, I have mentioned it, as it may have been caused by the earthquakes which were being felt in the United States and Canada.

Table of Temperature at the Albion Mines compared with Caledonia Mine. The sign † shows the Caledonia Mine was warmer. The sign -, colder than the Albion Mines.

Caledonia Mine, 1867.	MEAN NOON.		Difference.	MEAN NIGHT.		Difference.	DAILY MEAN.		Difference.
	Albion Mine.	Caledonia Mine.		Albion Mine.	Caledonia Mine.		Albion Mine.	Caledonia Mine.	
January.....	25.46	26.0	†.54	12.18	19.0	†6.82	18.84	22.5	†3.66
February.....	28.07	27.0	-1.07	10.95	16.7	†5.75	19.52	21.8	†2.28
March.....	36.13	29.5	-7.08	17.85	17.1	-.75	26.98	23.3	-3.68
April.....	46.24	40.8	-5.94	27.64	26.9	-.74	36.90	33.6	-3.30
May.....	59.28	49.2	-10.08	37.63	37.0	-.63	48.44	43.1	-5.34
June.....	69.99	60.8	-9.19	46.63	47.2	†.57	58.29	54.0	-4.29
July.....	77.80	66.7	-11.10	54.92	53.5	-.42	65.94	60.1	-5.84
August.....	76.34	74.7	-1.64	55.39	58.6	†3.21	65.85	66.6	†.75
September.....	65.64	62.3	-3.34	46.59	49.9	†3.31	56.09	56.1	†.01
October.....	53.88	50.0	-3.88	38.52	39.0	†.48	46.34	44.5	-1.84
November.....	42.25	40.6	-1.65	30.35	31.5	†.75	36.27	36.0	-.27
December.....	29.87	24.4	-5.47	18.65	13.7	-4.95	24.21	19.1	-5.11
Year.....	60.91	45.95	-4.96	33.11	34.17	†1.06	41.97	40.06	-1.91
Winter.....	27.80	25.80	-2.00	13.93	16.47	†2.54	20.86	21.13	†.27
Spring.....	47.22	39.66	-7.56	27.70	27.00	-.70	37.44	33.33	-4.11
Summer.....	74.71	67.40	-7.31	52.31	53.10	†.79	63.36	60.23	-3.13
Autumn.....	53.92	50.96	-2.96	38.49	46.10	†1.61	46.24	45.33	-.91

The temperature at Caledonia Mine is colder during the day than at the Albion Mines, except in January, February, June, August, September, October and November, and colder in March, April, May, July and December. 1867 Dec'r. has been unusually cold. In 1866 the mean temperature was 23 degrees or 4 degrees warmer.