Official, No. 34.

CONTRIBUTIONS

TO OUR

KNOWLEDGE OF THE METEOROLOGY

OF THE

ARCTIC REGIONS.

Published by the Authority of the Meteorological Council.

PART II.

LONDON:
PRINTED FOR HER MAJESTY'S STATIONERY OFFICE,
AND SOLD BY
J. D. POTTER, 31, POULTRY; AND EDWARD STANFORD, 55, CHARING CROSS.

1880.

Price Ten Shillings.

CHART OF THE PART OF ARCTIC AMERICA
SHOWING THE STATIONS FOR WHICH DATA ARE GIVEN IN PARTS I AND II.

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ERRATA IN PART I.

P. 20, line 21, 0 to 9° F., should be 32° to 41° F.
P. 29, column 5, should be headed Mean Sea.

PREFACE TO PART II.

In the preface to Part I. the general plan of these "Contributions to our Knowledge of the Meteorology of the Arctic Regions" has been sketched out.

The present Part contains the results of the discussion of a number of logs of vessels either frozen up in winter quarters or drifting with the ice, and therefore refers mainly to the winter season.

It will be noticed from the chart that the observations discussed are confined to the region extending from the meridian of 45° W. to that of 120° W., and from the parallel of 60° to that of 80° N.

The following is the List of the Expeditions, the records from which have been employed in the present Part :—

Locality.	Ship.	Captain.	Years.	No. of Months.	Observations.
Boothia - - -	"Victory" - -	Sir John Ross -	1829–32	27	Hourly.
Hudson's Strait - -	H.M.S. "Terror" -	Sir G. Back -	1836–7	12	Two-hourly.
Griffith Island - -	H.M.S. "Resolute" -	Sir H. Austin -	1850–1	12	Do.
Assistance Bay - -	"Lady Franklin" -	W. Penny -	1850–1	12	Four-hourly.
Northumberland Sound -	H.M.S. "Assistance" -	Sir E. Belcher -	1852–3	12	Two-hourly.
Do. do. -	H.M.S. "Pioneer" -	Sherard Osborn	Do.	12	Do.
Wellington Channel -	H.M.S. "Assistance" -	Sir E. Belcher -	1853–4	12	Do.
Do. do. -	H.M.S. "Pioneer" -	Sherard Osborn	Do.	12	Do.
Baffin's Bay - -	"Fox" - - -	Sir F. Leopold M'Clintock.	1857–8	9	Four-hourly.
Port Kennedy - -	Do. - - -	Do. do.	1858–9	12	Do.

The work, as before, has been entirely carried out by Mr. Richard Strachan.

April 1880.

ROBERT H. SCOTT.

O 801. Wt. 11752.

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No. VII.

Results of Meteorological Observations made in the Gulf of Boothia.

During Sir John Ross's search for a North-west Passage, in the "Victory," a meteorological register was kept hourly for most of the time, the original rough form of which has been presented to the Meteorological Office by Sir Edward Sabine, F.R.S. It ends with 1831. This document has furnished the observations now discussed, except those for 1832, which have been taken from the "Appendix to the Narrative of a Second Voyage in Search of a North-west Passage, and of a Residence in the Arctic Regions during the years 1829–33," by Sir John Ross, C.B., &c., &c. The observations from 1829 October 1st, to 1832 March 31st, are printed in a condensed form in this Appendix.

A separate register is also printed of the barometric observations, which were recorded only two or three times a day, from 1829 November 7th, to 1832 April 30th. "The mountain barometer from which the observations were registered was supplied by the Admiralty, and had been on the former voyage (1818). It was constructed by Mr. Jones, of Charing Cross, and the scale graduated to hundredths, and was regularly observed by Mr. Thom."

The "Narrative" states, under date 1829 October 31st: "The whole crew being divided into five watches, the three leading mates, the engineer and harpooner, had each, with one seaman, the charge of the deck in their respective turns; their duty being to keep a look-out respecting fire, wild animals, and natives, to register the direction and strength of the wind, with the appearances of the sky and weather, and the temperature, as well as the state of the tides, and the occurrence of auroræ. The officers, with their servants, the carpenters, the armourers, and the cook, had sufficient other duties in their respective departments." Two pages further on it is added, "Mr. Thom had charge of the log, as master no less than purser, together with that of the barometer and its attached thermometer."

The "Appendix" states, "The men were severally instructed to read off the degrees shown by Fahrenheit's thermometer, which was placed on the ice, in a canvas tent, at a convenient distance from the ship."

The force of the winds was estimated by Beaufort's scale, and the true direction was recorded while in harbour. The weather was recorded by Beaufort's notation.

The "Victory" was beset 1829–30, between McDiarmid Island and the main land. "A cairn on the island, intended as a guide to the ship to those who might lose their

way, was completed; and a thermometer, constructed purposely for us, was fixed on it."

The positions of the ship during the period under discussion were as follows:

1829, September 2nd, lat. 70° 36′ N., long. 92° 6′ W. 13th, off Cape Allington, (lat. 70° 34′ N., long. 92° W. per chart). 15th, lat. 70° 22′ N., long. 91° W. 25th, off Andrew Ross Island (lat. 70° 12′ N., long. 91° 30′ W. per chart). 30th, lat. 70° N., long. 92° 40′ W.

October 1st, in Felix Harbour, lat. 69° 58′ 42″ N., long. 92° 1′ 6″ W.

1830, September 17th, left Felix Harbour. 18th, beset in the ice, and cut a passage into Victoria Harbour, a few miles to north-eastward of the previous station (in lat. 70° 8′ N., long. 91° 35′ W. per chart).

1831, August 28th, left Victoria Harbour. 30th, beset in Mundy Harbour, lat. 70° 18′ 11″ N., (and long. 91° 40′ W. per chart).

1832, May 29th, deserted the "Victory."

November 1st, in Somerset House, Fury Beach (lat. 72° 47′ N., long. 91° 40′ W. per chart), "we began to keep regular watch, and register the thermometer every two hours;" but these observations have not been published and apparently cannot now be obtained.

As regards the character and accuracy of the instruments used nothing definite is known. The "Narrative" states under the dates specified:—

1829, December 4th. "We now compared the mercurial and spirit thermometers, as we might soon be called on to depend on the latter alone, and the necessary corrections were accorded (? recorded) for adoption."

1829, December 17th. "The westerly wind came round to the east, and it was then followed by a great increase of cold, when the thermometer at length fell to 37° *minus*. At this point the mercury froze, whether from being alloyed, or from the instrument having been ill graduated, we had no means of ascertaining, though the former was probable, as some other quicksilver which we had on board did not freeze."

1829, December 29th. "The thermometer went down as low as 37° *minus*, so that the suspected mercury froze again; but being calm weather the cold was not felt to be severe."

1830, January 15th. "We tried some mercury known to be pure and it froze. This was the test of a temperature of 39° *minus*, and as the thermometer by which we were now observing stood at the same mark, we were statisfied with its accuracy, as far as this point at least."

1830, February 10th. "We estimated on this day that the thermometer must have sunk to 48° *minus*, but at this point our instrument was uncertain."

On this subject, the freezing of mercury, the Appendix states, at p. cxv.: "The effect of cold on mercury depended materially on its purity, and I observed that the longer or the oftener it was used, it froze the sooner. It was at first imagined that the lead of the trough, which is generally used in artificial horizons, amalgamated with the mercury, but I always used a wooden trough, and a glass bottle to keep it in; notwithstanding which the scum, which was always greatest in cold weather, was equally large, and every year the mercury which had been used froze at a higher temperature, until it reached to thirty-one degrees, being eight degrees higher than the usual point; while mercury which had not been exposed, retained its purity. We went through the usual experiments of freezing it in a pistol bullet mould, and firing the ball through an inch board, as also the finest almond oil, which froze at fifteen degrees, and became very hard at thirty degrees, so as to penetrate, when formed into a bullet, through an inch plank at the distance of five yards."

The results of the computation in this discussion are given in two forms. In the first instance they are deduced for each place, Felix Harbour, Victoria Harbour, and Mundy Harbour, taking the months *seriatim;* and afterwards, the whole period is taken together, and the results are given for months of the same name in combination.

Table I. contains the monthly mean pressure at 9 a.m., 5, and 12 p.m. The barometrical observations as printed in the Appendix to the Narrative are stated to be "corrected for temperature, capacity, and neutral point" (*sic*). Several corrections have been made for evident errors, and the means have all been reworked. The period which they embrace does not exactly correspond with that comprised by the other data; accordingly they have not been combined for yearly values.

Table II. shows the monthly extremes of the barometer, with the accompanying temperature, wind, and weather. The highest reading was 30·76 in February 1830, the lowest 28·88 in October 1831, which month had the largest range, 1·7 inches. No aqueous precipitation occurred with the highest readings, and the state of the sky was on the whole clearer, and the force of the wind less with them than with the lowest readings.

With reference to the barometer, the "Narrative" remarks, under date 1829 November 7th, when, however, their experience was very limited: "The mercury has risen when it should have fallen, and it has sunk when there was present every reason that has been assigned for its rise. It has fallen with winds from the East and the North; and also (for this has been a reason given for its rise) with winds from the land; while it has risen under the reverse circumstances, being the received ones for its fall. Thus has a low barometer brought fair weather, and a high one rain; while I have also seen it fall with an East wind bringing violent rain, when, on coming round to West, the mercury rose even more than half an inch within a very short time, and with fine and settled weather. In a nautical view, these must indeed be considered as exceptions. I should be very sorry among others, were not this instrument still of much use on board of ships, especially in those seas and those seasons in which sudden and violent gales arise, but if its prognostics are not absolute, and not therefore such as to be an excuse for inattention to other circumstances, or for the omission of constant watchfulness at sea, so must it be recollected that in philosophy such exceptions prove our ignorance of laws which we pretend to know."

Table III. contains the mean hourly temperatures of the air for each month, and they admit of a comparison of one year with another. Thus it will be seen that March 1831

was the coldest month and was 13° colder than March 1830. July 1830 was the warmest month, and was about 7° warmer than July 1831. Indeed the first summer was from 4° to 7° warmer than the second, the first year 3° warmer than the second.

Table IV. shows the monthly extremes of temperatures with the accompanying wind and weather. The highest temperature recorded was 70° in July 1830; the lowest, *minus* 56°·5 in January 1831, or an absolute range of 126°·5. The greatest monthly range occurred in November of each year. The weather appears to have been clearer with the lowest than with the highest temperatures.

The "Narrative" remarks as follows, under the dates specified, upon the variations of temperature:

1829, November 7th. "I must confess that the vacillations in the heat were not always intelligible. We knew generally what a peculiar wind ought to produce, why an overcast sky should raise the temperature, or a fall of snow make the air comparatively warm, and why also we ought to expect the severest cold with a clear sky. But all our causes sometimes failed us, and I can only now conclude, as I did then, that our knowledge of the atmosphere and its conditions is as yet not sufficient to explain even the changes of temperature; failing us, as it does, in everything else, when we attempt to lay down those general rules, without the certainty of which there is no sound knowledge."

1829, November 12th. "It is worthy of remark, that the range of the thermometer, in the last thirty-six hours was 48°. If the ice was at all broken up by this gale, it was a matter which we had no means of discovering, as there was now but three hours of daylight. But it was likely; for the wind coming from the N.E. to the S.E. in the evening, there was an unusual high tide, and the ice near us burst open with a tremendous noise, admitting the water above it. The thermometer at midnight was as high as 26° *plus*.

"The temperature did not begin to fall till after noon on the 13th, and then very gradually. This was a long duration of what may be called a high heat at this season of the year; since it had been above 24° *plus* for about 18 hours, but the more remarkable fact is, that there was a north-easterly wind all the time." . . . . "According to general experience in these regions, the cold ought to have been severe. As to the thermometrical observations themselves, there can be no doubt of their accuracy, because they were made on shore, remote from the influence of the ship, while the instruments were the same that had been used on former expeditions. It was almost amusing to find the sportsmen complaining of the heat; and, with the snow that fell, there was some rain."

1829, November 30th. "The highest temperature had been with the north-easterly winds, and the lowest with the southerly ones: being the exact reverse of what was to be expected, and of what had occurred in former voyages. The only explanation that we could suggest, whether right or wrong, was that there was open water to the northward, and that the whole southern quarter was a mass of ice, whether on land or at sea."

1831, March 20th. "The continuance and degree of the cold at this period of the present month began seriously to attract our attention. . . . . The thermometer sank on this day to *minus* 52°, and the average of the 24 hours was but *minus* 49°. At four on the Monday morning the sun crossed the equator at this exceedingly low temperature: an occurrence which had no parallel in the preceding voyages."

Table V. furnishes the mean hourly temperatures of the air for each month of the year, and they have been plotted on Diagram No. 1. The annual mean temperature is 4°·2; the warmest month is July, mean 41°·3; the coldest, February, mean −31°·2; so that the mean range of temperature is 72°·5. The diurnal range of temperature almost disappears in November, December, January; it is feeble in February; it is very decided in March; it is greatest in May; and gradually decreases to October, when it is again feeble. The "Narrative" states:—"January is considered the coldest month in the year, taken as a whole, in these climates, though colder single days often occur in February and March. It (1830) had been the most stormy month, however, for some time, and the barometer was once as low as 29 inches."

Table VI. shows the mean hourly variation from the mean monthly temperature, and is merely a deduction from Table V.

Table VII. gives the hourly sums of the wind's components in each month.

Table VIII. gives the hourly sums of the wind's components during the whole period of detention in each harbour, Felix, Victoria, and Mundy. It will be seen that the east components are the same for the first and second years; that the west components of the second greatly exceeded those of the first year; that for the seven months of the third year the north components were actually greater than those for either of the preceding years. Probably some of these differences are due to the localities.

Table IX. exhibits the means of the winds for each month in each harbour, deduced from the components in Table VII., together with the duration of gales and calms. The predominance of N.W. and N.N.W. winds is at once evident. The prevailing winds through the first winter, 1829–30, in Felix Harbour were N.W. and the next N.E. South-easterly winds were light, and the total average of the wind was decidedly from the N.N.W. This was also true of the summer months. The winds in Victoria Harbour were more north-westerly. Those in Mundy Harbour were N.N.W. but much stronger, probably because this harbour opens to the north. There were about fifty days of calm during the year in Felix Harbour, against forty days during the year in Victoria Harbour, and calms were most frequent in March. With regard to the prevalent wind Sir John remarks: "This, together with the numerous and large rivers which discharge themselves into the Gulf of Boothia, must account for the strong current which Sir E. Parry found running to the eastward in Hecla and Fury Strait. During the second winter the wind prevailed from the north-west, but North-east winds were not so prevalent as during the former winter, South-west winds being the next; this may account for the winter being so severe, as there can be no doubt that the wind came from a colder quarter. These winds brought vast quantities of ice into the gulf." All the resultants are comprised between N. 15° E. and S. 70° W., an angle of 125°.

A column is added to this table giving the number of hours during which the wind blew with a force of 8 or a greater force; in other words, the hours of gales. September, December, and January appear to have had the most gales or strong winds.

With regard to the winds, the "Narrative" remarks:—

1831, January 31st. "There were many gales as the journal has shown, and, on all those days the barometer fell and the temperature rose. But it was an invariable remark that when the gale was from the northward the former fell less, and the thermometer rose more than when it was from any other quarter, as this was also most striking when the wind was from the southward. The auroræ were very inconspicuous, but the haloes were of a very striking character."

1831, June. "There was much stormy weather, but it is also a remarkable fact that, while in the former year the temperature always rose on those occasions, it never altered in the present one, making an essential difference between the two seasons, the cause of which was not apparent."

Table X. comprises the mean monthly sums of the wind components for each hour and for the whole period.

Table XI. is deduced from the preceding table, and shows the annual values expressive of the diurnal changes of the wind. The resultants are laid down in Diagram No. 2. There seems to be no indication of a range for the wind's direction; but, as regards its force, it is at a minimum about 2 p.m., and at a maximum about 3 a.m. The annual resultant of all the winds gives a transfer of air from N. 26° W. at the rate of 1·16 by Beaufort's scale.

Table XII. gives the total hourly calms under the months designated. At the top of each column is stated the number of days among which they occurred. On the whole the results show a periodicity, the minimum number of calms occurring at 1 p.m., and the maximum at 10 p.m., as is shown on Diagram No. 2. Calms were most frequent from November to March inclusive, least in August and September.

Table XIII. comprises the summaries of the winds of each month, referred to sixteen points, with their mean force. In most of the months the prevalent wind agrees with the resultant wind as deduced in Table IX. The N.N.W. winds appear to be peculiarly strong in September. December to April inclusive, though still having most air from the northward, have more frequent S. and S.W. winds than the other portion of the year. It will be noticed also that the winter winds have less strength than the summer winds. The prevalent winds of December 1829 were N., while those of 1830 were S.; again in June 1829 they were N.N.E., but in 1830, S.W. These two months are six months apart, and are probably times of transition from the North-westerly to the South-westerly winds.

Table XIV. contains the aggregate monthly summaries of the winds for the whole period, referred to sixteen points, with the mean force. The object of this tabulation and of Table XIII. is to exhibit the distribution of the winds around the compass, and their relative frequency. The places are kept distinct in Table XIII. in order to preserve any peculiar characteristics that locality may impress upon the winds.

Table XV. comprises the hourly notations of clear and of overcast weather in each month. February and March had a large proportion of clear weather. Indeed there was more clear weather in winter than in summer.

Table XVI. gives the hourly results of the observations on the temperature of the sea for the month of September 1829. They show a diurnal range of 1°·2, maximum at 2 p.m., minimum at midnight, mean 30°·1. The error of the thermometer is not known.

Table XVII. gives simply the total hours of mist, fog, rain, snow, squalls, and snowdrift in each month. Fog is confined to the summer months; rain falls in June, July, August, and September. During 1831 snow fell in every month, but July and August 1829 had no snow.

Table XVIII. gives the aggregate hourly notations of weather. Diagram No. 3 exhibits the diurnal range of blue sky, from which it appears that from December to March inclusive, the frequency of clear weather is much greater from 6 p.m. to 6 a.m. than it is from 6 a.m. to 6 p.m.; from April to September inclusive, it is greater from 9 a.m. to 9 p.m. than it is from 9 p.m. to 9 a.m.; October shows the same to a slighter extent; and November exhibits an opposite tendency. Generally the sky is more frequently clear in the winter than in the summer. There is no fog in the winter. Snow is very rare in July and August, and does not on an average fall on more than five or six days in any month. The total days of snow for the year are 40. Rain is confined to July and August, very seldom falling in June or September, and is not known in the other months; the total days of rain are eight. The "Narrative" remarks, under date 1830 December 4th: "A foot of snow is not a great depth of water, at least till it is frozen into a mass. Nor is it an easy matter to measure the depth to which a fall of snow is equivalent; such is the drifting, and still more, the difficulty of securing anything like an average within the compass of any gauge that has yet been devised. Had it been otherwise, we should have been as pleased as we were desirous, after a whole year's residence, to know the actual fall of water in this country and climate. As far as I have read, no such estimates have been attempted respecting these northern regions and lands of snow." Sir John Ross's long familiarity with snow does not appear to have reconciled him to it. Thus he writes, under date 1831, September 14th:—

"Snow deforms all landscape, destroys all 'keeping,' by confounding distances, and with that, proportions, and with that too, more and worse than all else, the harmony of colouring; giving us a motley patchwork of black and white, in places of those sweet gradations and combinations of colour which nature produces in her summer mood, even amid the most deformed and harsh of landscapes.

"These are the objections to a snow landscape which even the experience of a day may furnish; how much more, when, for more than half the year, all the element above-head is snow, when the gale is a gale of snow, the fog a fog of snow, when the sun shines but to glitter on the snow which is, yet does not fall, when the breath of the mouth is snow, when snow settles on the hair, the dress, the eyelashes, where snow falls around

us and fills our chambers, our beds, our dishes, should we open a door, should the external air get access to our 'penetralia'; where the 'crystal stream' in which we must quench our thirst is a kettle of snow with a lamp of oil, where our sofas are of snow, and our houses of snow; when snow was our decks, snow our awnings, snow our observatories, snow our larders, snow our salt; and when all the other uses of snow should be at last of no more avail, our coffins and our graves were to be graves and coffins of snow.

"Is this not more than enough of snow than suffices for admiration? is it not worse that during ten of the months of a year the ground is snow and ice and 'slush'; that during the whole year its tormenting, chilling, odious presence is ever before the eye? Who more than I has admired the glaciers of the extreme north; who more has loved to contemplate the icebergs sailing from the Pole before the tide and the gale, floating along the ocean, through calm and through storm, like castles and towers and mountains, gorgeous in colouring, and magnificent, if often capricious, in form; and have I, too, not sought, amid the crashing and the splitting and the thundering roarings of a sea of moving mountains, for the sublime, and felt that nature could do no more? In all this there has been beauty, horror, danger, everything that could excite; they would have excited the poet even to the verge of madness. But to see, to have seen, ice and snow, to have felt snow and ice for ever, and nothing for ever but snow and ice, during all the months of a year, to have seen and felt but uninterrupted and unceasing ice and snow during all the months of four years, this it is that has made the sight of those most chilling and wearisome objects an evil which is still one in recollection, as if the remembrance would never cease."

According to the "Narrative," the thickness of the ice was measured from time to time with the following results:—

Date.		Thickness.	Increase.	Decrease.
		ft. in.	ft. in.	ft. in.
1830.	January 6th - -	4 6	2 2*	—
	February 6th - -	6 0	1 6	—
	April 30th - -	7 6	1 6	—
	May 22nd - -	—	None.	—
	May 27th - -	†5 0	—	—
1831.	February 16th -	4 6	—	—
	April 30th - -	6 0	1 6	—
	May 6th - -	5 6	—	0 6
1831.	October 31st - -	1 7	—	—
	November 30th -	2 9	1 2	—
	December 31st -	4 0	1 3	—
1832.	February 3rd - -	5 0	1 0	—
	March 31st - -	7 0	2 0	—

* During December. † In a place late in freezing.

"The thickness of the ice was measured regularly, both on a lake and in the sea, every month, and was found to increase until the end of May, when it had arrived at its maximum thickness, which in the sea was 10 feet and the lake 11; the proportion being so much more on fresh than on salt water. In the months of February and March, when the temperature of the air was at 50 degrees below zero, the temperature of the ice gradually diminished between the surface and the water, which was immediately below the ice, at the temperature of 27 degrees; showing that to freeze sea-water below the ice (where no air was to be found), required a temperature of five degrees lower than the freezing point of Fahrenheit. This was done by excavating a large shaft in the ice, and, as it deepened, a horizontal hole was bored large enough to admit the thermometer at every foot in depth, until we arrived at the water, in which a thermometer was immediately immersed and the result obtained, the further detail of which need not be presented.

"The same experiments were made on snow, with proportional results; 12 feet depth of snow being equal in the resistance of cold to 7 feet of ice."

"The general effect of the cold on the snow as it fell was to pulverise it so that when a strong breeze came, it rose and filled the air like dust to a considerable height. On the other hand, in the valleys and every place into which the wind had forced the snow, it became so hard as to bear being formed into blocks."

Although many quotations have been made from Sir John Ross's "Narrative" it may be of additional interest to insert the following:—

1830, January 30th. "The sun appeared for the first time after an absence of 50 days."

1830, February 27th. "The sun had just power enough to raise the temperature from −43° to −38°, and after that it subsided to −42°. It was little more than a schoolboy's experiment to fire a ball of frozen mercury through an inch plank, but this had, possibly, not been done before."

1830, February 21st. "This was the finest and the warmest day that had yet occurred since November. It was calm, and the thermometer continued rising till it reached zero at midnight. It may surprise an English reader to hear of a warm day at a temperature of 32° under the freezing point, but the temperature of sensation is more relative than is imagined, and the body soon contrives to find a new and much lower scale of comfortable or endurable heat."

1830, March 31st. "It is worthy of remark, be it explained as it may, if indeed it be a steady fact, which we do not yet know, that all the coldest days occurred near the time of the full moon, and a little after, and that the temperature was highest immediately after the change."

1831, March 10th. "We froze oil of almonds in a shot mould at *minus* 40°, and fired it against a target, which it split, rebounding unbroken. A similar ball of ice had no effect."

1831, April 25th. "A breeze made it very cold, though the thermometer was *plus* 6° in the day, and not more than *minus* 10° at night. It is probable that we were

already beginning to find in our persons a new scale of agreeable temperature, though the extreme cold had not very long ceased. Physicians ought to explain these matters. Is it that the body generates more heat in cold weather, and the more as it is colder? If it did not, how could we be as warm at *minus* 50° as at *plus* 10° or 20°, putting out of the question all casualties from winds or an exposure to them. But be this explained as it may, why does the body change its standard, its opinions I may say, in such a manner? That which was not disagreeable a month since, was now intolerable; could a cold of *minus* 52° occur in July, with a day temperature of 70° *plus*, it is not easy to conceive what the feelings would be."

1831, June. "Commander Ross had explored much more of the coast, and it was remarked by both of us that the temperature on the western side of the peninsula and on the western lakes was from 10° to 15° lower than that at the ship, which was on the east side; while the comparisons were made with such care that we could not have been deceived."

1832, April 7th. "The thermometer rose on a sudden to *plus* 7°, not having passed zero before for 136 days. I do not believe there is another record of such a continuous low temperature."

In the Appendix, p. 116, it is remarked: "With regard to electricity, it is notorious that there is less in the Arctic Regions than in any other place; and, during my first voyage, the electrometer was never moved by the electric fluid, although often tried."

The mean time of sunrise and sunset, with approximate meridian altitude of the sun in lat. 70° N., are given in the subjoined table. Twilight as it affects the time of sunrise and sunset, and the effect of refraction in increasing the altitude are not taken into consideration:—

Month.	Sun. Rises. A.M. h.	m.	Sun. Sets. P.M. h.	m.	Altitude at Noon. °	′
January 15th	24 hours night				− 1	3
„ 21st	11	39	12	44	+ 0	11
February 15th	8	45	3	44	7	28
March „	6	31	5	47	18	2
April „	4	5	7	55	29	55
May 15th	1	13	10	39	38	58
„ 20th	24 hours day.				40	4
June 21st	„				43	27
July 23rd	„				40	1
„ 24th	12	39	11	34	39	49
August 15th	3	12	8	56	33	57
September „	5	23	6	27	22	54
October „	7	25	4	7	11	20
November „	10	15	1	14	1	24
„ 22nd	24 hours night.				− 0	14
December 21st	„				− 3	27

Days of 24 hours' duration - 65
Nights „ „ - 60

TABLE I.

MEANS OF BAROMETRICAL OBSERVATIONS, MADE ON BOARD THE "VICTORY" AT—

A.—FELIX HARBOUR, 1829 November, to 1830 August.

Hours.	Sept.	Oct.	Nov.*	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Year.
9 a.m.	—	—	29·702	29·896	29·689	30·114	30·014	30·000	30·254	30·124	29·864	29·872	—
5 p.m.	—	—	·663	·896	·696	·120	·018	29·998	·241	·107	·866	·871	—
12 „	—	—	—	—	—	·116	·000	30·012	·232	·084	·849	·835	—
Mean	—	—	29·682	29·896	29·692	30·117	30·011	30·003	33·242	30·105	29·860	29·859	—

* Commenced on 7th.

B.—VICTORIA HARBOUR, 1830 September, to 1831 August.

Hours.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Year.
9 a.m.	29·822	29·905	30·007	30·086	30·121	29·965	29·894	29·967	30·033	29·942	29·919	29·863	29·960
5 p.m.	·849	·894	·036	·094	·129	·979	·914	·984	·044	·947	·922	·850	·970
12 „	·831	·867	·037	·068	·136	·972	·901	·979	·044	·936	·920	·855	·962
Mean	29·834	29·889	30·027	30·083	30·129	29·972	29·903	29·977	30·040	29·942	29·920	29·856	29·964

C.—MUNDY HARBOUR, 1831 September, to 1832 April.

Hours.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.
9 a.m.	29·812	30·014	30·112	29·783	29·632	29·858	29·985	29·995
5 p.m.	·810	·026	·114	·785	·646	·863	·987	30·007
12 „	·822	·037	·117	·763	·655	·856	·981	·010
Mean	29·815	30·026	30·114	29·777	29·644	29·859	29·984	30·004

Table II.

Extremes of Barometrical Pressure with accompanying Temperature, Wind, and Weather, Ship "Victory," at—

A.—Felix Harbour, from 1829 November, to 1830 August.

Month.	Date.	Max.	Temp.	Wind.	Weather.	Date.	Min.	Temp.	Wind.	Weather.	Range.
	d. h.	inches.	°			d. h.	inches.	°			inch.
November -	30 9	30·182	−36	N.W. 1	b	25 9	29·240	−8	N.E. 1	o	0·942
December -	29 5	·430	36·5	W. 1	"	23 9	·405	16·5	S.W. 2	"	1·025
January -	10 9	·155	36	Calm	"	18 5	28·920	11	N.b.W. 9	o s	1·235
February -	16 5	·765	36	N.N.E. 1	"	8 5	29·645	37	S.W. 1	b	1·120
March -	29 M.	·362	− 3·5	N.W. 2	"	12 5	·645	−25	N.N.E. 2	o s	0·717
April -	11 5	·523	+18	" 1	o	6 5	·210	+18	S.S.W. 2	"	1·313
May -	23 9	·660	19	" 2	b	2 M.	·772	8	N.N.E. 2	c	0·888
June -	1 M.	·545	27·5	E. 1	f	26 9	·700	46	E.N.E. 1	b	0·845
July -	7 9	·390	42	N.N.E. 2	b	27 9	·270	42	W. 2	c r	1·120
August -	25 5	·205	+37	N.E. 4	c	10 5	·295	+39·5	N.N.W. 4	o	0·910
Absolute -	Feb.	30·765	—	—	—	Jan.	28·920	—	—	—	1·845

B.—Victoria Harbour, 1830 September, to 1831 August.

September -	30 M.	30·140	+15	N. 2	b	5 M.	29·200	+31	N.E. 3	o s	0·940
October -	9 5	·244	+ 8	W.N.W. 1	"	5 5	·421	20	N.b.E. 3	"	0·823
November -	14 5	·662	−27·5	S. 1	"	6 5	·178	+22	N. 2	o	1·484
December -	9 5	·698	10	N.W. 2	o	25 5	·300	−16·5	S.W. 3	"	1·398
January -	5 9	·714	54	S.W. 2	b	17 M.	·522	13	N.W.b.N. 7	o s	1·192
February -	5 5	·600	22·5	S.S.W. 3	o	24 9	·038	18	N.N.W. 3	b	1·562
March -	15 9	·229	27	W.S.W. 3	b	22 5	·458	37	W. 1	"	0·771
April -	3 9	·440	− 2	N. 2	o	8 9	·493	− 6	N.W. 3	"	0·947
May -	3 9	·440	+ 8	N.E. 4	"	22 9	·515	+20	E. 5	o s	0·925
June -	7 9	·345	28	S.S.E. 2	b	4 9	·624	24	N.W. 3	b c	0·721
July -	21 89	·218	39	S. 1	c	5 9	·480	34	S.E. 4	o s	0·738
August -	31 9	·217	+30	" 1	b c	16 5	·158	+34	E.S.E. 4	o f	1·058
Absolute -	Jan.	30·714	—	—	—	Feb.	29·038	—	—	—	1·676

C.—Mundy Harbour, 1831 September, to 1832 April.

September -	30 M.	30·147	+ 16	N. 3	b f	4 M.	29·326	+27	N.b.W. 9	c q	0·821
October -	30 5	·580	− 4·5	W. 1	b	26 5	28·880	2·5	E.S.E. 5	b	1·700
November -	14 9	·502	+ 6	S. 1	o	10 5	29·520	+12	W. 1	o	0·982
December -	2 M.	·380	−23	N. 5	b	21 9	·236	− 8·8	N.W. 9	b c	1·144
January -	31 5	·478	28	N.N.W. 5	"	22 9	·178	33	N. 10	o	1·300
February -	21 9	·380	36	" 5	"	23 9	·280	35·5	N.N.W. 1	b c	1·100
March -	6 5	·440	−41	S.W. 1	"	9 5	·525	−28	S. 3	c	0·915
April -	25 M.	·380	—	—	—	10 9	·576	—	—	—	0·804
Absolute -	Oct.	30·580	—	—	—	Oct.	28·880	—	—	—	1·700

Table III.

Mean Hourly Temperature of the Air.

A.—Felix Harbour, Boothia, Ship "Victory," 1829 September, to 1830 August.

Hours.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Year.
1 a.m. -	+28·8	+ 7·7	−6·4	−23·5	−25·6	−29·3	−25·7	−4·6	+ 9·4	+31·4	+39·5	+37·1	+3·2
2 " -	28·8	7·8	6·2	23·6	25·7	29·5	25·9	4·8	10·0	31·6	39·8	37·2	3·3
3 " -	28·9	7·9	6·1	23·4	25·8	29·5	25·8	4·9	10·8	32·0	40·3	37·5	3·5
4 " -	29·0	8·0	6·0	23·5	25·8	29·4	26·0	4·5	11·8	32·6	41·4	38·2	3·8
5 " -	29·1	7·8	6·5	23·3	25·7	29·4	26·3	3·8	12·8	33·5	42·4	38·2	4·1
6 " -	29·2	8·1	6·5	23·1	25·6	29·6	25·9	2·7	14·0	35·3	43·4	38·5	4·6
7 " -	29·5	8·3	6·4	23·2	25·6	29·4	25·1	−1·3	14·8	36·5	44·3	39·3	5·1
8 " -	29·8	8·4	6·2	23·4	25·9	29·2	22·9	+1·0	15·8	37·2	44·8	39·8	5·8
9 " -	30·4	9·0	5·6	23·2	25·7	28·9	19·0	2·8	16·9	38·8	45·1	40·6	6·8
10 " -	30·6	9·5	5·5	23·2	25·5	27·9	16·1	4·5	17·8	40·0	46·0	41·6	7·6
11 " -	31·0	10·3	5·4	23·2	25·6	26·3	13·3	5·8	18·5	41·3	47·5	42·5	8·6
12 " -	31·1	10·8	5·0	23·3	25·2	25·2	11·2	7·4	19·4	43·2	48·6	43·4	9·5
1 p.m. -	31·2	10·9	5·3	23·0	25·4	25·1	11·1	7·9	19·7	44·1	49·2	44·1	9·8
2 " -	31·1	10·6	5·6	23·0	25·5	25·8	11·9	7·7	19·4	43·6	49·8	44·6	9·6
3 " -	31·0	9·9	6·0	23·2	25·6	26·7	13·1	6·9	19·2	42·1	49·8	44·9	9·1
4 " -	30·9	9·3	6·2	23·4	25·8	27·9	15·0	6·8	19·0	40·9	49·2	44·7	8·5
5 " -	30·3	8·4	6·2	23·5	25·7	28·6	17·4	4·7	18·3	39·9	48·2	43·5	7·7
6 " -	30·2	8·0	6·3	23·6	25·7	28·9	19·3	3·1	17·4	38·6	47·2	42·7	6·9
7 " -	29·9	7·4	6·3	23·9	25·9	29·6	20·7	+1·1	16·5	37·4	45·9	41·8	6·1
8 " -	29·6	7·2	6·4	23·9	26·2	29·9	21·9	−0·9	15·7	36·2	44·1	40·8	5·4
9 " -	29·2	7·0	6·0	23·9	26·2	29·8	22·3	2·3	14·4	34·8	43·2	39·4	4·8
10 " -	29·1	6·8	6·2	23·8	26·2	29·8	22·8	3·2	13·0	33·7	41·8	38·5	4·2
11 " -	28·6	6·6	6·4	23·7	26·1	29·8	23·1	3·8	11·8	32·6	40·6	37·6	3·7
12 " -	+28·3	+6·4	−6·6	−23·7	−26·0	−29·8	−23·5	−4·1	+11·0	+31·8	+39·7	+37·0	+3·4
Means -	+29·8	+ 8·4	−6·1	−23·4	−25·6	−28·6	−20·2	+0·8	+15·3	+37·0	+44·7	+40·6	+6·1

Table III. (*continued*).

Mean Hourly Temperature of the Air.

B.—Victoria Harbour, Boothia, Ship "Victory," 1830 September, to 1831 August.

Hours.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Year.
1 a.m. -	+25°·1	+10·5	−10°·4	−19°·0	−24°·7	−31°·7	−37°·0	− 9°·2	+ 9°·0	+26°·6	+34°·6	+34°·4	+ 0°·7
2 - -	24·8	10·5	10·6	19·1	24·6	31·7	37·2	9·5	8·9	26·6	34·8	34·4	0·6
3 - -	24·8	10·5	10·6	19·2	24·5	31·6	37·4	9·9	9·0	26·7	34·9	34·5	0·6
4 - -	25·1	10·5	10·6	19·1	24·4	31·7	37·5	10·0	9·7	27·8	35·2	34·6	0·8
5 - -	25·6	9·9	10·6	18·9	24·5	31·6	37·3	9·2	11·2	28·9	36·0	34·4	1·2
6 - -	25·8	10·0	10·8	18·9	24·5	31·5	37·1	8·1	12·4	29·1	36·7	34·6	1·5
7 - -	26·6	9·9	10·8	18·8	24·4	31·5	36·7	6·5	14·0	30·4	37·4	35·3	2·1
8 - -	27·7	10·0	10·8	18·9	24·4	31·6	35·6	4·7	15·8	31·3	38·0	36·0	2·7
9 - -	28·4	10·6	10·8	19·0	24·4	31·2	33·5	− 2·2	18·7	32·8	38·8	36·8	3·7
10 - -	29·1	11·1	10·5	19·0	24·2	30·6	31·3	+ 0·3	21·2	34·5	39·4	37·4	4·8
11 - -	30·1	11·7	10·3	19·1	24·1	29·9	29·3	1·3	22·7	35·5	40·0	38·0	5·5
12 - -	30·4	12·4	9·8	19·1	24·1	29·3	27·2	2·3	23·4	36·5	40·6	38·3	6·2
1 p.m. -	30·6	12·3	9·5	19·1	23·8	28·8	26·2	2·4	23·7	37·1	40·9	38·9	6·5
2 - -	30·4	12·0	9·6	19·1	23·6	29·1	26·1	1·9	24·5	37·0	41·0	38·8	6·5
3 - -	30·2	11·6	9·9	19·1	23·6	29·8	26·5	+ 0·8	23·6	36·8	40·6	38·7	6·1
4 - -	29·5	11·1	10·5	19·3	23·6	30·7	27·7	− 0·7	22·0	35·8	40·2	38·4	5·4
5 - -	28·7	10·8	11·0	19·0	23·5	31·3	29·6	2·1	19·8	34·5	39·6	38·2	4·6
6 - -	27·7	10·6	11·2	19·0	23·4	31·5	31·8	3·6	18·2	33·4	39·1	37·9	3·9
7 - -	26·8	10·6	11·3	19·0	23·6	31·8	33·4	5·0	16·6	32·3	38·8	37·3	3·2
8 - -	26·3	10·7	11·6	19·1	23·6	31·9	34·5	6·0	15·3	31·4	38·3	37·0	2·7
9 - -	26·0	10·8	11·7	19·1	23·7	32·3	35·1	7·0	14·0	30·1	37·5	36·4	2·2
10 - -	25·7	10·8	11·8	19·3	23·6	32·5	35·7	7·7	12·8	28·8	36·8	35·5	1·6
11 - -	25·4	11·0	11·8	19·5	23·5	32·6	36·1	8·4	11·9	28·2	36·0	34·9	1·3
12 - -	+25·1	+11·1	−11·8	−19·5	−23·5	−32·8	−36·2	− 8·6	+11·1	+27·6	+35·5	+34·3	+ 1·0
Means -	+27·3	+10·9	−10·8	−19·1	−24·0	−31·2	−33·2	− 4·6	+16·2	+31·7	+37·9	+36·5	+ 3·1

Table III. (*concluded*).

Mean Hourly Temperature of the Air.

C.—Mundy Harbour, Boothia, Ship "Victory," 1831 September, to 1832 March.

Hours.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.
1 a.m. -	+23°·0	+ 8°·3	+ 0°·1	−24°·7	−28°·2	−34°·3	−33°·8
2 „ -	23·0	8·3	0·1	24·5	28·0	34·1	33·7
3 „ -	22·7	8·2	0·0	24·4	28·1	34·3	34·0
4 „ -	22·6	8·2	0·0	24·0	28·0	34·2	34·4
5 „ -	22·4	8·4	0·4	23·9	28·1	34·2	34·7
6 „ -	22·4	8·4	+ 0·1	23·7	28·1	34·2	34·2
7 „ -	22·7	8·8	− 0·2	23·5	28·0	34·1	34·5
8 „ -	23·1	9·3	0·7	23·4	28·0	34·1	33·6
9 „ -	23·3	9·4	0·9	23·6	27·6	33·9	31·8
10 „ -	23·6	9·8	0·9	23·5	27·6	33·5	29·8
11 „ -	23·9	10·4	0·8	23·4	27·4	32·8	28·4
12 „ -	24·3	10·6	0·9	23·3	27·4	32·1	26·9
1 p.m.	25·0	10·5	1·3	23·4	26·9	31·8	26·0
2 „ -	24·8	10·0	1·8	23·6	27·0	31·7	25·8
3 „ -	24·8	9·5	2·0	23·7	27·1	32·2	26·2
4 „ -	24·6	9·0	2·1	23·8	27·0	32·9	27·3
5 „ -	24·3	8·6	2·5	24·3	27·1	33·5	29·4
6 „ -	23·9	8·5	2·6	24·1	27·1	33·7	30·7
7 „ -	23·6	8·4	2·6	24·2	27·2	34·0	31·6
8 „ -	23·4	8·5	2·2	24·4	27·3	34·2	32·3
9 „ -	23·1	8·4	2·0	24·3	27·5	34·4	32·9
10 „ -	23·0	8·3	1·9	24·6	27·5	34·7	33·4
11 „ -	22·9	8·3	2·0	24·5	27·5	34·8	33·5
12 „ -	+22·6	+ 8·1	− 2·0	−24·3	−27·6	−34·7	−33·6
Means -	+23·5	+ 8·9	− 1·2	−24·0	−27·6	−33·7	−31·4

Table IV.

Extremes of Temperature with accompanying Wind and Weather, Ship "Victory," at—

A.—Felix Harbour, from 1829 September, to 1830 August.

Months.	Date.		Max.	Wind.		Weather.	Date.		Min.	Wind.		Weather.	Range.
	d.	h.	°				d.	h.	°				°
September -	2	4	+40·0	N.N.W.	2	b	30	12	+17·0	N.W.	2	b	23·0
October -	8	0	24·0	E.b.N.	3	s	30	20	−16·7	W.N.W.	4	"	40·7
November -	12	14	+26·0	N.N.E.	1	b	30	7	37·0	E.b.N.	1	"	63·0
December -	4	16	− 8·0	N.E.	6	"	29	14	37·0	Calm		"	29·0
January -	5	3	− 5·0	S.	1	o	16	14	43·0	"		"	38·0
February -	23	3	+ 1·5	"	1	"	10	17	47·0	"		"	48·5
March -	31	1	20·0	Calm		g	16	17	40·0	"		"	60·0
April - -	13	1	31·0	S.S.W.	2	o	23	16	20·0	N.E.	1	"	51·0
May - -	30	1	37·0	"	1	b	11	13	− 1·0	Calm		"	38·0
June - -	20	1	62·0	E.	1	"	1	15	+26·0	S.	1	f	34·0
July - -	22	4	70·0	Calm		"	2	16	32·0	N.	2	f r	38·0
August -	5	4	+58·0	V.	1	"	2	12	+33·0	"	2	b	25·0
Absolute -	July.		+70·0	—		—	Feb.		−47·0	—		—	117·0

B.—Victoria Harbour, 1830 September, to 1831 August.

September -	15	0	+43·0	S.W.b.W.	3	c	28	15	+ 5·0	W.N.W.	4	c	38·0
October -	14	16	24·0	S.	11	o s	28	10	−11·0	W.	1	b c	34·0
November -	4	17	24·0	N.	7	"	25	7	39·0	Calm		b	63·0
December -	3	2	6·0	S.	3	"	31	12	45·0	N.W.	1	"	51·0
January -	16	8	2·5	N.N.W.	3	"	4	15	56·5	Calm		"	59·0
February -	1	22	+ 9·5	E.N.E.	1	o	20	6	47·0	"		"	56·5
March -	31	2	− 8·5	E.	1	c s	20	17	49·0	"		"	40·5
April - -	21	1	+30·0	Calm		o	—	16	24·0	W.b.S.	2	"	54·0
May - -	27	3	36·0	W.	2	b c	—	15	−15·0	Calm		"	51·0
June - -	23	1	52·0	S.	2	b	2	17	+14·0	W.	2	b c	38·0
July - -	30	3	50·0	N.N.W.	3	b c	1	17	31·0	N.W.	6	o	19·0
August -	2	3	+54·0	W.	5	b	29	12	+24·0	N.	5	b	30·0
Absolute -	Aug.		+54·0	—		—	Jan.		−56·5	—		—	110·5

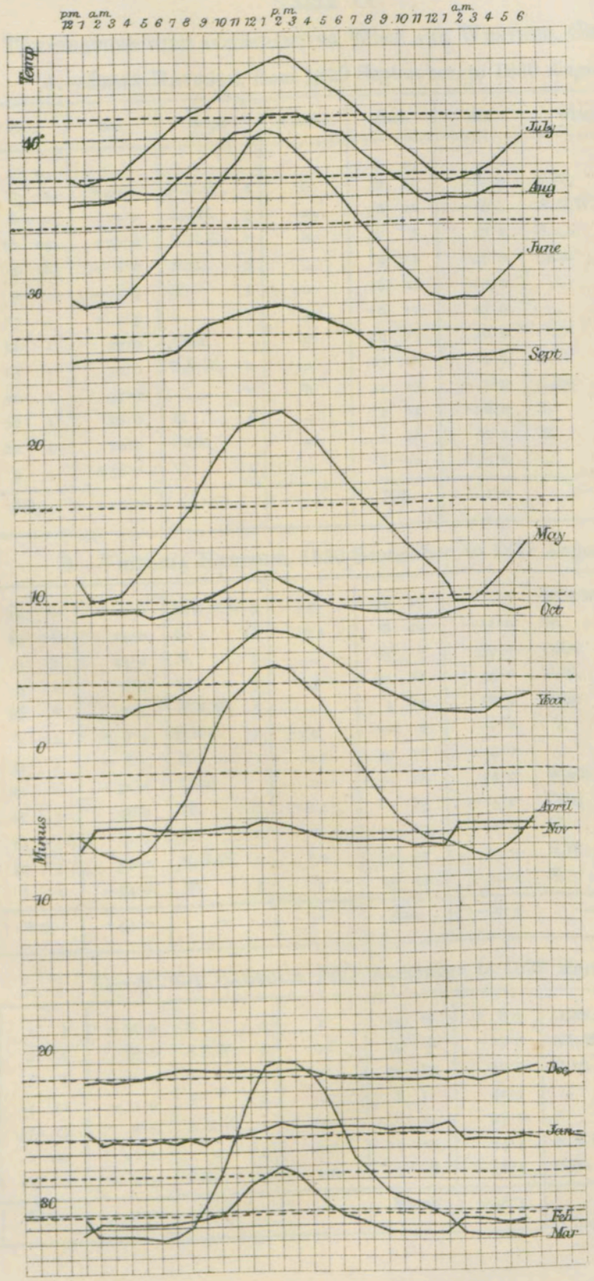
C.—Mundy Harbour, 1831 September, to 1832 March.

September -	1	3	+36·0	S.	2	o	23	17	+ 6·0	Calm		b	30·0
October -	2	1	29·0	S.S.W.	2	o f	24	8	−23·0	N.b.W.	6	"	52·0
November -	1	1	+20·0	S.	3	o	30	12	42·0	Calm		"	62·0
December -	15	21	− 2·0	N.	5	b	1	11	42·5	"		"	40·5
January -	17	15	8·0	N.N.W.	5	o	8	22	47·0	N.	1	"	39·0
February -	2	10	12·0	"	5	b c	19	12	44·5	N.N.W.	6	"	32·5
March -	28	2	− 4·5	S.E.	2	o s	5	8	−48·5	Calm		"	44·0
Absolute -	Sept.		+36·0	—		—	March		−48·5	—		—	84·5

Diagram No. 1.

DIURNAL RANGE OF AIR TEMPERATURE IN THE GULF OF BOOTHIA.

1829 September to 1832 March.



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Dangerfield. Lith. 22. Bedford St. Covent Garden.

Table V.

Mean Hourly Temperature of the Air in the Gulf of Boothia for each Month of the Year, deduced from Observations made on board the "Victory" during the period from 1829 September, to 1832 March, inclusive.

Hours.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Year.
1 a.m. -	+25°·6	+8°·8	−5°·6	−22°·4	−26°·2	−31°·8	−32°·2	−6°·9	+9°·2	+29°·0	+37°·0	+35°·7	+1°·7
2 „ -	25·5	8·9	5·6	22·4	26·1	31·8	32·3	7·1	9·4	29·1	37·3	35·8	1·7
3 „ -	25·5	8·9	5·6	22·3	26·1	31·8	32·4	7·4	9·9	29·3	37·6	36·0	1·8
4 „ -	25·6	8·9	5·5	22·2	26·1	31·8	32·6	7·2	10·7	30·2	38·3	36·4	2·1
5 „ -	25·7	8·7	5·6	22·0	26·1	31·7	32·8	6·5	12·0	31·2	39·2	36·3	2·4
6 „ -	25·8	8·8	5·7	21·9	26·1	31·8	32·6	5·4	13·2	32·2	40·0	36·3	2·7
7 „ -	26·3	9·0	5·8	21·8	26·0	31·7	32·1	3·9	14·4	33·4	40·8	37·3	3·3
8 „ -	26·9	9·2	5·9	21·9	26·1	31·6	30·7	−1·8	15·8	34·2	41·4	37·9	3·9
9 „ -	27·4	9·7	5·8	21·9	25·9	31·3	28·1	+0·3	17·8	35·8	41·9	38·7	4·9
10 „ -	27·8	10·1	5·6	21·9	25·8	30·7	25·7	2·4	19·5	37·2	42·7	39·5	5·8
11 „ -	28·3	10·8	5·5	21·9	25·7	29·7	23·7	3·5	20·6	38·4	43·7	40·2	6·6
12 „ -	28·6	11·3	5·2	21·9	25·7	28·9	21·8	4·8	21·4	39·8	44·6	40·8	7·3
1 p.m. -	28·9	11·2	5·5	21·8	25·4	28·6	21·1	5·0	21·7	40·6	45·0	41·5	7·6
2 „ -	28·8	10·9	5·6	21·9	25·4	28·9	21·3	4·8	21·9	40·3	45·4	41·7	7·6
3 „ -	28·7	10·3	5·9	22·0	25·4	29·6	21·9	3·8	21·4	39·4	45·2	41·8	7·1
4 „ -	28·3	9·8	6·1	22·2	25·5	30·5	23·3	3·0	20·5	38·3	44·7	41·5	6·5
5 „ -	27·8	9·3	6·4	22·3	25·4	31·1	25·5	+1·3	19·0	37·2	43·9	40·8	5·7
6 „ -	27·3	9·0	6·6	22·2	25·4	31·4	27·3	−0·2	17·8	36·0	43·1	40·3	5·0
7 „ -	26·8	8·8	6·7	22·4	25·6	31·8	28·6	1·9	16·5	34·8	42·3	39·5	4·3
8 „ -	26·4	8·8	6·6	22·5	25·7	32·0	29·6	3·4	15·5	33·8	41·2	38·9	3·7
9 „ -	26·1	8·7	6·5	22·4	25·8	32·2	30·1	4·6	14·2	32·4	40·3	37·9	3·2
10 „ -	25·7	8·6	6·6	22·6	25·8	32·3	30·6	5·4	12·9	31·2	39·3	37·0	2·6
11 „ -	25·6	8·6	6·7	22·6	25·7	32·4	30·9	6·1	11·8	30·4	38·3	36·2	2·2
12 „ -	+25·3	+8·5	−6·8	−22·5	−25·7	−32·4	−31·6	−6·3	+11·0	+29·7	+37·6	+35·6	+1·9
Means -	+26·9	+9·4	−6·0	−22·2	−25·8	−31·2	−28·3	−1·9	+15·8	+34·3	+41·3	+38·5	+4·2

Table VI.

Mean Hourly Variation from the Mean Monthly Temperature of the Air in the Gulf of Boothia, from Observations made on board the "Victory" duriug the period from 1829 September, to 1832 March, inclusive.

Hours.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Year.
1 a.m. - -	−1°·3	−0°·6	+0°·4	−0°·2	−0°·4	−0°·6	−3°·9	−5°·0	−6°·6	−5°·3	−4°·3	−2°·8	−2°·5
2 „ - -	1·4	0·5	0·4	0·2	0·3	0·6	4·0	5·2	6·4	5·2	4·0	3·0	2·5
3 „ - -	1·4	0·5	0·4	−0·1	0·3	0·6	4·1	5·5	5·9	5·0	3·7	2·5	2·4
4 „ - -	1·3	0·5	0·5	0·0	0·3	0·6	4·3	5·3	5·1	4·1	3·0	2·1	2·1
5 „ - -	1·2	0·7	0·4	+0·2	0·3	0·5	4·5	4·6	3·8	3·1	2·1	2·2	1·8
6 „ - -	1·1	0·6	0·3	0·3	0·3	0·6	4·3	3·5	2·6	2·1	1·3	2·2	1·5
7 „ - -	−0·6	0·4	0·2	0·4	0·2	0·5	3·8	−2·0	−1·4	0·9	−0·5	1·2	0·9
8 „ - -	0·0	−0·2	0·1	0·3	0·3	0·4	−2·4	+0·1	0·0	−0·1	+0·1	−0·6	−0·3
9 „ - -	+0·5	+0·3	0·2	0·3	−0·1	−0·1	+0·2	2·2	+2·0	+1·5	0·6	+0·2	+0·7
10 „ - -	0·9	0·[illegible]	0·4	0·3	0·0	+0·5	2·6	4·3	3·7	2·9	1·4	1·0	1·6
11 „ - -	1·4	1·4	0·5	0·3	+0·1	1·5	4·6	5·4	4·8	4·1	2·4	1·7	2·4
12 „ - -	1·7	1·9	0·8	0·3	0·1	2·3	6·5	6·7	5·6	5·5	3·3	2·3	3·1
1 p.m. - -	2·0	1·8	0·5	0·4	0·4	2·6	7·2	6·9	5·9	6·3	3·7	3·0	3·4
2 „ - -	1·9	1·5	0·4	0·3	0·4	2·3	7·0	6·7	6·1	6·0	4·1	3·2	3·4
3 „ - -	1·8	0·9	+0·1	+0·2	0·4	1·6	6·4	5·7	5·6	5·1	3·9	3·3	2·9
4 „ - -	1·4	+0·4	−0·1	0·0	0·3	0·7	5·0	4·9	4·7	4·0	3·4	3·0	2·3
5 „ - -	0·9	−0·1	0·4	−0·1	0·4	+0·1	2·8	3·2	3·2	2·9	2·6	2·3	1·5
6 „ - -	+0·4	0·4	0·6	0·0	0·4	−0·2	+1·0	+1·7	2·0	1·7	1·8	1·8	0·8
7 „ - -	−0·1	0·6	0·7	−0·2	0·2	0·6	−0·3	0·0	+0·7	+0·5	+1·0	1·0	+0·1
8 „ - -	0·5	0·6	0·6	0·3	+0·1	0·8	1·3	−1·5	−0·3	−0·5	−0·1	+0·4	−0·5
9 „ - -	0·8	0·7	0·5	0·2	0·0	1·0	1·8	2·7	1·6	1·9	1·0	−0·6	1·0
10 „ - -	1·2	0·8	0·6	0·4	0·0	1·1	2·3	3·5	2·9	3·1	2·0	1·5	1·6
11 „ - -	1·3	0·8	0·7	0·4	+0·1	1·2	2·6	4·2	4·0	3·9	3·0	2·3	2·0
12 „ - -	−1·6	−0·9	−0·8	−0·3	+0·1	−1·2	−3·3	−4·4	−4·8	−4·6	−3·7	−2·9	−2·3
Mean Temperature	+26·9	+9·4	−6·0	−22·2	−25·8	−31·2	−28·3	−1·9	+15·8	+34·3	+41·3	+38·5	+4·2

Table VII.

Monthly Sums of Wind Components.

A.—Felix Harbour, Boothia, Ship "Victory," 1829 September, to 1830 August.

Hours.	September, 1829.				October, 1829.				November, 1829.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
1 a.m. -	93·0	17·4	14·8	26·7	46·4	9·8	9·5	50·3	54·4	3·9	22·6	3·9
2 „ -	97·4	17·4	15·2	23·1	46·8	9·2	10·2	48·9	57·9	3·9	24·4	3·9
3 „ -	97·2	18·4	15·8	23·7	49·9	8·5	9·2	50·4	55·7	3·9	25·1	5·7
4 „ -	91·2	18·7	14·0	23·2	48·5	8·9	8·2	54·6	55·2	2·6	24·7	5·3
5 „ -	86·9	18·1	13·8	22·4	47·6	10·3	10·2	48·2	50·3	2·1	16·0	2·5
6 „ -	89·3	18·3	13·1	22·9	49·0	10·6	11·0	45·7	51·2	0·4	16·0	6·7
7 „ -	85·4	17·3	13·7	22·8	41·6	9·9	11·0	40·0	45·1	0·4	13·1	6·7
8 „ -	83·3	12·6	13·2	22·0	43·8	8·2	8·7	44·3	43·7	1·4	16·9	6·0
9 „ -	81·5	15·5	17·6	27·6	36·4	10·4	5·2	46·7	50·7	2·7	14·0	9·2
10 „ -	77·8	14·6	14·8	32·8	38·1	10·6	5·2	46·3	56·5	2·7	18·4	9·2
11 „ -	75·5	15·3	14·8	31·9	36·0	14·9	5·2	39·1	58·3	2·3	18·7	9·0
12 „ -	74·6	15·5	18·4	30·0	36·0	14·9	5·2	39·1	60·2	1·3	19·5	10·8
1 p.m. -	76·3	20·2	18·3	31·9	30·8	16·9	6·6	34·2	56·5	4·1	22·1	8·0
2 „ -	75·8	22·2	17·3	31·9	30·7	16·9	6·6	34·3	59·6	4·1	23·5	8·0
3 „ -	74·2	22·4	16·2	31·2	31·2	17·7	6·4	33·4	59·3	5·5	22·3	10·1
4 „ -	74·3	21·5	15·0	31·7	34·8	7·8	5·8	35·8	58·4	6·2	20·7	12·3
5 „ -	66·5	21·0	12·9	33·5	33·9	7·6	8·8	36·1	58·0	7·9	24·6	7·9
6 „ -	67·8	18·4	7·9	33·1	34·7	6·6	8·8	35·0	59·2	7·9	25·6	7·7
7 „ -	65·6	18·3	10·6	31·8	39·6	7·2	8·8	35·0	51·7	5·0	22·2	9·0
8 „ -	66·8	18·2	11·3	33·6	41·1	3·7	9·9	34·0	54·1	5·8	24·1	9·9
9 „ -	69·8	18·5	12·2	35·5	47·9	8·5	11·9	40·0	56·5	3·8	22·9	6·4
10 „ -	75·1	19·5	13·2	35·5	45·9	12·2	11·9	43·7	55·0	5·7	22·7	7·3
11 „ -	77·8	23·5	14·4	40·0	47·4	11·8	12·3	43·3	55·3	6·7	21·8	9·0
12 „ -	82·6	20·1	8·1	37·2	50·7	10·4	13·5	41·8	54·4	9·2	21·4	8·3
Means -	79·4	18·5	14·0	29·8	41·2	10·6	8·8	41·7	54·9	4·1	21·0	7·6

Table VII. (*continued*).

Monthly Sums of Wind Components.

A.—Felix Harbour, Boothia, Ship "Victory," 1829 September, to 1830 August—*cont.*

Hours.	December, 1829.				January, 1830.				February, 1830.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
1 a.m. -	37·4	13·7	8·8	27·4	34·5	13·8	4·4	11·6	24·0	12·3	6·1	4·3
2 „ -	38·9	14·7	9·5	27·7	35·5	13·8	4·4	11·2	25·8	14·3	6·7	4·3
3 „ -	42·7	12·7	10·5	25·8	37·2	17·8	4·6	13·9	24·8	15·0	8·4	4·3
4 „ -	39·7	11·0	10·1	25·5	34·1	17·0	4·2	13·9	25·8	15·9	8·5	7·2
5 „ -	33·1	14·0	9·3	26·0	31·0	20·5	1·9	18·0	25·5	13·7	8·4	10·7
6 „ -	32·2	15·7	8·3	25·0	32·0	20·0	2·9	17·2	25·5	13·0	8·4	10·7
7 „ -	35·4	14·8	9·0	22·3	36·1	19·0	2·3	16·1	23·6	13·7	7·9	11·4
8 „ -	34·8	18·5	8·7	18·9	34·1	21·4	2·7	16·7	23·5	14·4	8·0	10·4
9 „ -	38·1	22·8	4·8	18·9	37·0	19·3	—	19·7	21·0	17·0	6·7	10·6
10 „ -	35·6	19·9	5·2	20·3	35·9	20·3	—	22·5	19·2	19·2	5·8	9·8
11 „ -	34·0	23·3	4·8	25·7	38·9	19·8	—	21·9	19·2	15·7	5·8	8·3
12 „ -	32·0	23·3	4·8	25·3	42·7	18·0	1·1	20·9	20·0	15·3	6·3	7·4
1 p.m. -	34·0	20·3	4·4	25·0	48·9	20·3	—	25·1	22·5	14·9	8·8	5·9
2 „ -	32·2	21·0	4·7	25·7	44·0	25·3	—	24·1	22·1	14·7	8·8	7·8
3 „ -	32·5	17·3	4·7	23·6	48·0	21·4	0·7	23·8	22·0	17·3	11·2	13·5
4 „ -	33·2	17·6	4·7	23·4	47·7	18·5	0·7	25·1	20·6	16·4	7·8	12·0
5 „ -	27·7	23·4	1·8	21·2	43·4	17·4	2·8	17·9	21·6	11·3	7·5	9·1
6 „ -	24·8	20·4	6·9	21·2	40·5	22·5	2·8	18·1	23·5	11·3	8·3	10·1
7 „ -	26·3	21·2	6·5	22·9	41·5	21·4	4·2	20·6	19·6	12·1	7·5	11·4
8 „ -	24·3	21·6	6·5	26·3	43·0	21·2	5·7	18·9	14·4	11·9	5·1	10·7
9 „ -	26·0	22·7	8·0	25·9	36·7	16·9	3·7	15·4	14·6	11·8	5·5	5·4
10 „ -	27·5	15·5	7·4	25·8	38·6	16·6	3·7	15·6	16·7	14·7	6·2	6·2
11 „ -	29·8	19·0	6·8	23·3	32·6	15·6	4·1	15·3	21·4	14·8	7·1	5·4
12 „ -	29·1	20·0	6·8	22·6	39·7	16·6	3·7	16·7	19·2	16·2	8·9	6·8
Means -	32·6	18·5	6·8	24·0	38·9	18·9	2·5	18·3	21·5	14·5	7·5	8·5

Table VII. (*continued*).

Monthly Sums of Wind Components.

A.—Felix Harbour, Boothia, Ship "Victory," 1829 September, to 1830 August—*cont.*

Hours.	March, 1830.				April, 1830.				May, 1830.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
1 a.m. -	18·3	11·6	4·4	11·1	35·5	20·8	9·1	20·8	34·8	7·5	13·2	18·6
2 „ -	17·4	11·8	3·7	11·0	38·0	22·8	11·4	22·4	32·1	12·6	12·4	14·8
3 „ -	16·5	12·5	4·4	11·0	36·1	24·6	11·0	20·5	36·8	6·2	12·2	20·5
4 „ -	17·7	13·1	4·7	9·6	31·6	18·3	11·0	19·6	31·8	6·2	10·1	22·0
5 „ -	18·5	9·7	6·3	11·3	29·5	16·4	14·8	16·9	33·9	9·8	11·6	15·5
6 „ -	17·5	3·7	5·3	13·3	37·7	13·4	18·5	18·4	35·9	13·2	11·9	19·3
7 „ -	18·5	2·6	5·6	11·7	35·2	16·8	17·8	15·3	35·7	10·8	16·4	22·6
8 „ -	17·5	3·6	4·9	11·7	44·5	19·1	19·7	19·1	34·8	11·6	15·5	24·1
9 „ -	21·6	8·7	6·4	18·9	42·6	18·5	15·3	30·2	32·1	9·3	17·4	24·5
10 „ -	22·4	8·3	7·6	18·0	40·1	18·9	12·1	30·2	31·8	11·0	19·0	26·2
11 „ -	22·3	4·5	7·9	17·6	40·1	15·9	14·8	27·6	28·4	19·9	17·0	26·6
12 „ -	19·6	4·5	7·2	14·3	33·8	15·9	14·8	26·6	26·7	19·2	16·5	23·3
1 p.m. -	16·2	6·5	7·8	10·2	37·3	11·1	14·9	29·3	25·7	13·9	14·0	20·0
2 „ -	18·8	6·5	8·3	8·5	39·3	16·9	10·6	30·2	28·8	15·2	12·8	25·7
3 „ -	17·4	7·6	4·6	15·2	40·9	16·4	15·1	28·3	25·3	11·9	16·9	26·0
4 „ -	16·0	8·3	4·2	16·4	36·9	18·1	9·6	31·4	25·4	11·2	15·6	25·0
5 „ -	22·0	4·8	3·3	10·8	41·1	16·7	12·1	32·2	26·9	5·8	16·9	22·6
6 „ -	23·1	7·2	5·7	8·0	39·4	15·8	19·8	24·5	27·0	5·3	18·4	21·6
7 „ -	22·2	5·1	6·0	5·1	37·5	17·0	11·0	29·9	23·1	9·1	17·5	20·8
8 „ -	22·8	4·3	6·5	6·4	34·6	17·5	12·9	29·5	26·5	8·9	17·1	19·2
9 „ -	21·8	3·7	3·9	5·9	39·9	15·8	11·0	32·7	25·3	10·9	12·5	18·0
10 „ -	22·9	3·7	3·5	5·9	39·0	16·1	8·5	31·4	29·9	10·9	12·6	20·4
11 „ -	24·9	5·4	3·5	9·1	37·9	16·2	9·4	33·4	31·0	10·7	12·1	22·6
12 „ -	21·8	4·4	4·2	8·3	39·2	14·5	10·2	27·6	26·9	5·6	11·6	20·7
Means -	19·9	6·8	5·4	11·2	37·8	17·2	13·1	26·2	29·9	10·7	14·6	21·7

Table VII. (*continued*).

Monthly Sums of Wind Components.

A.—Felix Harbour, Boothia, Ship "Victory," 1829 September, to 1830 August—*concluded*.

Hours.	June, 1830.				July, 1830.				August, 1830.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
1 .m. -	23·8	9·6	8·5	28·8	49·9	2·0	3·2	18·0	63·1	2·8	4·2	30·1
2 „ -	25·4	6·1	9·5	34·2	50·4	3·4	4·6	21·7	68·3	3·5	5·6	34·7
3 „ -	25·8	10·1	10·2	36·0	48·1	2·7	4·8	20·0	65·8	2·8	4·5	32·6
4 „ -	25·6	6·3	11·0	31·9	43·7	2·0	4·1	20·7	59·4	4·2	5·2	30·5
5 „ -	27·3	8·5	12·2	28·8	44·1	6·3	4·7	21·2	59·1	5·2	4·5	35·9
6 „ -	29·9	7·8	11·0	20·4	45·8	6·3	5·4	19·8	61·0	3·8	3·8	40·2
7 „ -	30·1	6·3	11·4	18·8	44·3	5·0	6·2	15·4	63·5	6·3	3·6	39·6
8 „ -	32·5	7·8	11·8	17·8	39·7	3·4	5·5	12·9	61·6	6·6	5·0	34·4
9 „ -	31·4	12·5	17·2	15·5	39·4	6·4	7·2	14·9	63·1	9·3	4·3	25·9
10 „ -	32·2	11·8	18·8	11·5	39·1	6·4	7·9	15·9	65·9	11·3	7·1	23·1
11 „ -	32·4	16·2	18·5	13·6	37·6	6·4	6·8	15·5	64·5	12·1	9·3	19·3
12 „ -	31·2	19·1	18·4	14·1	38·2	7·4	6·2	14·0	62·5	13·2	8·6	19·2
1 p.m. -	32·2	13·3	18·7	15·4	39·1	5·7	6·1	12·0	60·0	8·8	9·2	17·3
2 „ -	31·8	14·0	18·5	15·6	38·0	7·0	5·7	9·0	64·0	8·8	9·9	20·6
3 „ -	30·2	13·2	16·3	16·4	34·3	11·3	5·1	8·8	62·7	8·9	12·7	24·1
4 „ -	29·7	10·2	14·8	19·2	34·0	9·0	5·8	9·8	59·2	9·9	9·9	24·9
5 „ -	28·0	8·3	14·4	19·3	30·8	6·5	4·0	9·3	56·5	8·8	9·5	19·5
6 „ -	28·0	9·0	13·4	19·0	33·3	5·3	4·8	8·4	56·6	9·8	10·7	21·1
7 „ -	27·5	6·5	9·1	16·5	32·2	2·3	4·8	8·6	55·9	6·7	11·1	23·2
8 „ -	26·7	7·2	9·9	14·8	36·1	2·3	6·3	8·0	53·6	8·1	10·8	23·1
9 „ -	26·6	10·1	8·0	14·0	39·1	1·4	7·8	9·2	52·9	7·4	11·1	22·2
10 „ -	28·1	11·5	8·0	15·7	45·0	2·4	7·5	12·0	56·4	12·1	9·5	24·8
11 „ -	27·7	13·5	7·7	19·5	44·3	0·7	6·1	9·8	65·2	9·6	6·9	28·5
12 „ -	29·1	10·5	8·0	16·1	43·5	1·0	6·1	8·3	68·6	6·7	6·5	20·4
Means -	28·9	10·4	12·7	19·7	40·4	4·7	5·7	13·5	61·2	7·7	7·6	26·5

Table VII. (*continued*).

Monthly Sums of Wind Components.

B.—Victoria Harbour, Ship "Victory," 1830 September, to 1831 August.

Hours.	September, 1830.				October, 1830.				November, 1830.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
1 a.m. -	77·3	19·2	10·3	37·2	30·7	24·0	18·9	50·4	44·6	13·6	10·9	20·6
2 „ -	76·6	18·2	10·3	40·8	36·7	28·5	20·1	48·4	40·2	16·2	12·2	17·7
3 „ -	76·5	17·6	11·0	41·1	35·0	31·8	18·4	45·4	39·0	13·8	12·4	19·6
4 „ -	75·6	13·0	10·0	28·4	33·1	32·6	17·9	45·5	37·9	16·5	13·5	16·8
5 „ -	62·7	9·4	10·6	31·8	32·9	30·4	15·4	43·2	39·1	15·3	12·2	16·2
6 „ -	63·1	11·6	6·5	35·1	30·2	31·7	15·1	50·4	40·1	14·3	10·6	12·3
7 „ -	54·7	12·5	9·3	31·9	30·7	28·3	14·8	49·8	34·9	14·8	9·6	14·9
8 „ -	55·2	16·1	10·5	31·8	25·4	28·6	16·2	40·8	29·2	13·3	9·9	13·8
9 „ -	55·2	17·6	9·0	36·0	22·1	21·6	18·0	39·6	26·2	11·3	11·3	11·3
10 „ -	60·2	17·3	9·8	36·0	21·6	21·0	14·7	47·2	30·1	10·6	10·8	10·4
11 „ -	61·5	13·5	11·2	33·8	15·4	19·9	11·6	44·9	31·3	9·0	11·3	12·9
12 „ -	65·4	13·8	11·2	38·2	15·8	22·4	12·3	45·5	29·6	9·3	12·1	12·9
1 p.m. -	63·5	19·8	11·6	32·3	14·1	18·7	12·5	42·3	31·6	7·3	7·4	14·3
2 „ -	68·0	22·4	12·3	30·0	11·2	17·9	11·9	36·6	31·5	8·3	7·4	12·2
3 „ -	69·6	21·5	12·8	24·0	15·6	15·8	11·6	34·1	31·6	10·8	6·8	11·2
4 „ -	69·6	20·2	12·4	27·8	18·2	17·1	10·5	34·7	28·6	12·3	8·0	11·2
5 „ -	69·8	17·5	11·9	24·5	18·1	16·4	8·4	34·9	29·5	12·2	6·6	10·9
6 „ -	69·4	14·1	12·0	27·1	17·2	18·4	10·8	36·6	25·0	10·3	6·2	14·4
7 „ -	70·3	11·5	8·6	32·3	14·9	17·0	16·2	39·8	23·9	6·0	9·6	12·7
8 „ -	67·2	14·7	7·8	31·0	16·9	19·8	16·2	38·7	24·7	4·0	7·6	11·9
9 „ -	72·8	10·0	8·2	38·1	19·3	24·0	18·0	42·2	32·3	9·0	7·5	14·1
10 „ -	77·4	13·8	9·8	37·9	20·7	25·8	18·2	47·4	35·7	9·8	10·4	14·2
11 „ -	74·2	15·7	8·8	43·1	23·4	22·0	22·5	44·0	38·0	11·1	11·9	13·5
12 „ -	71·7	15·9	8·6	43·2	22·6	23·2	19·3	45·4	39·1	8·6	14·8	11·7
Means -	67·8	15·7	10·2	33·9	22·6	23·2	15·4	42·8	33·1	11·2	10·0	13·8

Table VII. (*continued*).

Monthly Sums of Wind Components.

B.—Victoria Harbour, Boothia, Ship "Victory," 1830 September, to 1831 August.—*cont.*

Hours.	December, 1830.				January, 1831.				February, 1831.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
1 a.m. -	32·1	30·4	14·9	20·6	38·8	14·2	—	26·7	22·9	22·7	—	24·3
2 „ -	32·3	30·0	13·7	21·3	39·3	11·5	—	29·0	22·1	20·6	—	21·7
3 „ -	32·3	30·4	15·6	25·0	35·2	7·4	—	28·6	23·6	19·4	—	26·7
4 „ -	37·9	24·8	10·6	26·2	37·1	9·9	—	24·7	25·4	21·5	1·8	25·1
5 „ -	39·0	26·4	8·0	24·6	39·4	16·1	—	26·0	24·2	25·0	2·5	19·8
6 „ -	37·4	25·5	8·0	24·4	41·8	14·8	—	29·6	25·0	27·4	3·6	21·9
7 „ -	35·5	24·6	7·3	23·5	39·3	12·4	1·0	26·5	24·4	27·3	2·9	19·5
8 „ -	35·5	25·1	9·3	27·8	38·8	11·0	1·7	20·9	26·2	24·7	2·5	20·4
9 „ -	37·7	24·4	7·2	26·5	41·5	12·2	1·0	24·2	24·4	29·7	8·1	18·8
10 „ -	38·2	21·5	6·8	25·2	38·8	12·5	1·0	29·1	22·2	28·6	7·4	13·9
11 „ -	39·2	22·9	7·5	20·5	36·6	12·8	—	36·0	19·3	36·6	6·4	15·2
12 „ -	39·3	22·7	6·8	20·2	33·4	13·9	—	36·4	14·5	34·4	7·9	15·3
1 p.m. -	38·5	23·4	6·3	20·1	46·6	12·4	4·3	34·1	14·0	26·9	4·8	19·5
2 „ -	37·9	21·8	6·3	20·4	49·7	12·4	4·7	35·9	11·7	27·9	3·2	20·0
3 „ -	33·2	21·2	9·6	20·5	48·7	11·6	2·4	47·6	14·2	24·9	3·2	18·5
4 „ -	42·1	19·6	12·3	21·3	42·7	8·5	1·8	44·3	10·4	25·7	2·1	19·4
5 „ -	42·9	20·9	10·2	25·3	37·1	13·9	1·7	30·3	13·6	22·1	2·1	22·1
6 „ -	44·6	23·5	6·3	24·1	40·9	14·8	3·5	29·3	14·7	20·9	2·1	22·0
7 „ -	42·6	23·2	6·3	24·4	51·9	14·4	3·8	31·0	13·6	21·9	3·5	25·2
8 „ -	46·1	23·1	5·5	26·2	45·6	10·6	3·5	25·3	15·0	22·9	5·0	26·9
9 „ -	36·1	18·8	8·1	18·8	47·2	11·5	3·7	20·4	13·0	15·9	4·8	22·4
10 „ -	36·5	17·4	8·1	17·8	48·5	10·8	3·9	21·6	11·4	19·7	2·8	25·6
11 „ -	32·6	20·9	12·5	16·4	47·7	14·9	4·1	24·0	13·6	20·8	2·8	33·0
12 „ -	32·7	22·1	12·5	14·9	43·2	11·5	5·7	25·1	11·4	23·0	5·5	29·6
Means -	37·6	23·5	9·2	22·3	42·1	12·3	2·0	29·5	18·0	24·6	3·5	22·0

Table VII. (*continued*).

Monthly Sums of Wind Components.

B.—Victoria Harbour, Boothia, Ship "Victory," 1830 September, to 1831 August—*cont.*

Hours.	March, 1831.				April, 1831.				May, 1831.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
1 a.m. -	10·8	12·5	1·6	20·7	52·9	8·2	6·3	36·7	44·3	11·4	13·9	24·7
2 „ -	9·1	13·7	1·6	18·9	53·9	7·8	11·2	30·1	46·7	11·4	13·5	23·8
3 „ -	10·3	14·9	3·7	21·9	50·5	7·4	10·5	35·3	41·7	11·7	14·8	22·0
4 „ -	10·9	21·1	2·5	25·7	53·2	6·3	10·3	34·0	40·5	9·7	14·3	19·6
5 „ -	6·7	17·1	2·5	30·2	47·6	6·5	8·6	31·5	44·6	7·1	15·8	27·3
6 „ -	8·5	16·7	4·6	28·5	48·7	11·9	13·1	36·4	46·3	8·4	15·6	31·0
7 „ -	11·3	16·7	2·5	25·4	52·0	7·4	9·5	35·3	48·0	8·1	13·6	32·9
8 „ -	11·3	14·5	3·1	23·2	54·8	4·8	7·6	32·1	47·4	9·5	14·0	32·3
9 „ -	12·4	19·1	8·8	27·7	56·3	11·8	4·0	32·6	51·0	6·6	14·7	28·8
10 „ -	12·6	23·8	8·8	28·9	59·9	10·6	4·3	31·5	54·7	8·2	16·1	26·2
11 „ -	12·2	21·9	7·3	32·0	61·2	12·4	6·8	37·5	57·0	11·8	17·8	26·6
12 „ -	12·1	20·6	7·3	26·5	65·4	11·5	6·2	41·7	57·4	12·0	16·8	26·2
1 p.m. -	18·0	22·4	2·8	23·3	56·7	15·6	2·5	32·2	51·4	10·1	17·1	26·7
2 „ -	18·7	20·9	3·8	24·5	57·7	15·4	2·3	33·5	48·8	9·4	16·2	27·1
3 „ -	20·3	23·4	6·0	24·9	63·1	13·2	5·0	33·3	47·8	8·4	14·6	27·3
4 „ -	20·9	14·6	4·9	28·4	65·7	12·5	3·9	33·5	51·6	10·1	14·6	29·7
5 „ -	20·0	13·1	4·9	25·8	56·8	8·4	5·1	28·5	48·2	6·7	13·7	28·4
6 „ -	17·6	16·8	3·8	24·4	57·1	8·4	5·1	32·5	48·2	7·8	11·2	26·5
7 „ -	14·1	19·3	5·6	20·2	55·8	8·5	3·8	31·1	45·3	11·1	10·7	18·7
8 „ -	11·8	20·8	6·6	20·9	55·4	9·1	3·8	29·9	42·3	10·7	12·9	18·0
9 „ -	11·2	14·4	1·4	14·7	52·3	5·0	4·0	36·0	46·3	7·3	8·5	19·6
10 „ -	13·0	12·7	2·2	13·0	54·8	5·2	3·6	34·3	46·0	7·5	11·4	21·9
11 „ -	16·5	11·5	0·8	17·6	46·7	4·8	4·3	34·2	45·1	7·1	17·9	22·3
12 „ -	14·8	13·7	1·1	12·6	54·4	4·0	4·6	33·2	46·6	7·4	14·6	21·9
Means -	13·5	17·3	4·1	23·3	55·5	9·0	6·1	33·6	47·8	9·1	14·3	25·4

Table VII. (*continued*).

Monthly Sums of Wind Components.

B.—Victoria Harbour, Boothia, Ship "Victory," 1830 September, to 1831 August—*concluded.*

Hours.	June, 1831.				July, 1831.				August, 1831.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
1 a.m.	11·5	19·3	2·0	36·7	43·2	9·0	17·4	25·8	36·9	11·7	15·8	33·1
2 „ -	11·9	20·6	2·0	44·4	40·9	12·0	21·0	27·7	41·6	13·0	16·1	30·0
3 „ -	14·1	20·7	2·1	41·8	42·5	10·2	22·0	23·5	43·4	9·8	14·4	39·5
4 „ -	18·4	21·7	1·4	42·8	41·0	16·9	20·2	15·5	34·4	11·6	16·8	30·6
5 „ -	18·7	20·9	2·8	52·1	49·8	16·9	19·9	20·7	35·0	8·8	16·9	37·9
6 „ -	19·7	20·0	1·4	54·6	50·9	14·5	20·6	24·6	37·9	7·8	18·9	31·3
7 „ -	21·7	21·8	2·9	51·8	46·5	12·8	20·1	23·2	32·9	9·2	19·7	34·7
8 „ -	20·3	26·5	3·6	49·4	44·4	15·7	19·0	23·8	30·7	8·1	20·7	32·9
9 „ -	22·7	26·0	0·8	43·7	43·2	8·3	22·0	21·0	30·2	8·5	21·3	26·9
10 „ -	21·6	29·3	0·8	44·1	42·2	10·6	21·5	24·2	28·4	10·2	22·9	29·8
11 „ -	23·0	29·5	0·8	43·2	43·3	19·5	23·4	18·8	28·3	12·9	24·0	29·4
12 „ -	24·3	33·8	1·1	46·3	40·3	20·5	23·6	17·9	28·7	14·8	19·6	32·0
1 p.m. -	13·3	28·3	3·8	46·6	45·2	21·2	22·8	13·0	31·0	14·7	21·3	31·8
2 „ -	13·7	28·0	5·9	43·2	47·7	21·7	24·1	10·2	32·0	14·3	22·4	29·8
3 „ -	15·3	30·6	9·0	41·7	48·0	22·0	25·0	10·2	36·8	13·0	21·7	27·9
4 „ -	18·1	28·9	8·0	42·3	47·6	13·3	24·8	15·6	35·4	19·9	24·2	29·1
5 „ -	19·6	29·5	5·3	44·9	42·1	6·7	20·3	18·4	29·0	19·7	26·1	30·4
6 „ -	19·3	30·1	5·3	43·8	37·5	7·6	20·2	13·6	30·1	15·4	25·8	28·7
7 „ -	19·9	19·2	4·4	39·9	33·6	9·6	20·1	18·9	33·5	11·7	15·6	30·2
8 „ -	21·1	17·6	4·4	36·6	32·2	14·0	17·0	12·9	33·1	12·7	16·8	29·6
9 „ -	21·9	23·6	3·7	39·4	34·9	14·1	22·1	11·8	23·9	13·6	14·7	29·9
10 „ -	23·9	22·4	3·7	40·6	37·4	15·4	21·9	14·8	27·5	14·2	15·0	37·5
11 „ -	18·4	25·5	5·2	32·6	36·5	16·9	21·9	15·0	27·3	16·4	15·0	38·3
12 „ -	21·1	22·1	3·1	35·2	37·6	17·8	22·2	13·5	33·5	14·2	16·2	31·0
Means -	18·9	24·8	3·5	43·2	42·0	14·5	21·4	18·3	32·6	12·8	19·2	31·8

Table VII. (*continued*).

Monthly Sums of Wind Components.

C.—Mundy Harbour, Boothia, Ship "Victory," 1831 September, to 1832 March.

Hours.	September, 1831.				October, 1831.				November, 1831.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
1 a.m. -	74·3	17·9	9·6	40·0	64·0	22·8	6·4	12·2	30·5	21·8	5·5	8·7
2 „ -	79·8	18·9	7·3	39·3	64·9	18·3	5·1	16·1	38·1	27·1	7·0	10·7
3 „ -	91·6	14·2	7·0	41·5	65·3	18·4	3·9	21·1	36·3	26·5	7·0	12·5
4 „ -	89·5	8·2	8·7	35·2	66·2	16·1	6·4	14·0	34·8	24·4	7·7	11·4
5 „ -	91·9	7·3	8·1	32·2	61·1	10·3	9·2	16·6	37·2	26·4	11·2	11·7
6 „ -	97·6	9·1	8·6	34·4	61·1	9·6	9·2	17·6	37·8	29·7	15·0	13·3
7 „ -	95·4	9·0	11·5	33·6	57·0	9·6	8·5	15·4	32·9	28·4	15·7	10·1
8 „ -	96·1	7·7	9·6	32·4	59·7	11·5	9·6	16·5	34·8	21·2	11·4	8·4
9 „ -	98·9	8·7	6·1	31·6	60·9	13·3	2·4	18·1	36·3	14·7	6·9	8·3
10 „ -	100·8	8·3	6·6	31·1	62·4	15·1	3·7	20·8	33·7	13·9	6·6	12·6
11 „ -	95·7	13·4	8·0	34·5	62·4	18·0	4·6	19·5	34·0	12·2	6·7	14·7
12 „ -	91·7	15·5	8·2	34·4	60·8	14·0	6·0	16·3	34·2	15·1	8·6	12·4
1 p.m. -	91·0	12·2	7·8	23·3	59·3	13·5	7·2	14·5	29·3	12·1	8·3	10·8
2 „ -	87·7	12·5	7·3	19·7	52·8	18·6	6·1	13·6	31·4	16·7	8·9	10·4
3 „ -	88·8	12·2	8·2	18·6	52·9	18·6	5·1	13·4	29·4	12·9	5·1	7·0
4 „ -	86·8	9·6	8·9	20·3	52·9	18·9	6·0	13·5	31·4	12·6	6·1	7·2
5 „ -	69·3	10·9	14·2	19·5	51·7	12·0	9·4	18·4	29·1	18·5	7·7	4·8
6 „ -	65·7	9·4	12·8	19·5	52·0	13·7	11·5	18·1	33·2	16·3	7·5	4·4
7 „ -	67·0	6·9	14·5	23·8	60·8	14·2	12·0	14·6	28·4	18·7	8·3	4·2
8 „ -	67·1	7·3	16·3	22·5	62·5	11·7	12·4	14·0	26·9	22·1	10·2	4·5
9 „ -	69·9	4·9	13·9	24·2	56·2	12·0	12·8	12·9	33·1	15·6	10·0	3·0
10 „ -	71·3	4·9	15·3	23·0	59·0	14·9	11·0	13·4	30·4	14·7	10·2	11·7
11 „ -	77·7	5·7	14·8	25·8	65·8	14·4	7·5	15·0	26·4	16·9	2·2	10·6
12 „ -	81·1	7·4	14·7	33·4	65·7	13·6	7·5	13·6	25·5	21·1	5·1	12·9
Means -	84·4	10·1	10·3	28·9	59·9	14·7	7·6	15·8	32·3	19·1	8·3	9·4

Table VII. (*continued*).

Monthly Sums of Wind Components.

C.—Mundy Harbour, Boothia, Ship "Victory," 1831 September, to 1832 March—*cont.*

Hours.	December, 1831.				January, 1832.				February, 1832.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
1 a.m. -	86·5	1·1	2·3	22·7	89·5	25·8	6·9	19·0	89·9	10·9	4·4	40·1
2 " -	80·4	1·1	2·3	24·5	90·6	26·8	6·9	19·1	97·3	11·9	4·4	43·2
3 " -	84·9	2·5	5·6	25·1	88·8	26·2	6·8	17·6	95·4	8·9	5·4	44·4
4 " -	82·4	2·8	3·0	21·8	90·7	25·3	6·8	18·2	97·7	4·9	5·4	42·3
5 " -	83·4	2·7	1·7	28·7	92·7	20·2	5·1	25·4	100·0	6·0	2·2	43·0
6 " -	82·7	3·4	2·4	30·5	89·8	23·9	6·6	26·3	104·7	6·0	2·2	44·5
7 " -	81·0	4·8	2·4	28·3	90·0	26·1	8·3	25·5	103·6	7·7	3·2	45·3
8 " -	84·1	8·8	3·8	29·9	86·5	22·9	6·9	24·5	100·9	8·5	6·2	43·4
9 " -	77·7	4·8	7·8	34·3	86·5	19·7	1·8	29·1	100·2	7·2	8·5	40·9
10 " -	79·7	5·8	7·8	34·3	82·1	21·4	1·8	25·9	99·2	10·5	6·9	40·9
11 " -	82·0	8·1	5·1	34·4	88·5	23·0	1·8	31·5	93·5	7·5	8·8	38·6
12 -	84·7	9·2	5·2	35·5	85·1	25·7	2·9	29·3	91·4	10·6	6·5	37·8
1 p.m. -	82·4	8·0	6·5	38·0	83·2	22·3	5·7	35·5	86·8	8·0	11·2	35·7
2 " -	80·6	8·0	6·5	37·2	83·8	23·0	4·7	36·5	86·8	11·9	11·5	35·7
3 " -	81·1	7·0	6·2	38·2	86·9	26·8	7·7	38·4	91·2	14·2	6·3	38·0
4 " -	78·8	7·2	7·2	38·3	87·1	25·1	8·4	38·8	97·7	10·6	4·7	41·1
5 " -	68·7	6·7	4·4	31·5	88·4	21·6	4·0	30·8	98·5	3·1	5·8	41·5
6 " -	67·8	5·7	4·7	27·0	90·3	22·0	4·8	31·8	96·6	5·1	5·8	40·7
7 " -	67·3	4·7	4·7	26·6	91·2	19·8	5·2	31·4	97·9	7·8	5·5	43·6
8 " -	68·6	3·9	6·5	28·7	97·1	23·3	5·9	33·3	92·7	7·8	5·5	40·6
9 " -	63·1	4·0	4·5	21·9	92·1	21·8	1·9	31·1	83·9	5·1	2·1	37·2
10 " -	63·0	3·1	5·1	22·2	96·4	21·8	1·9	32·5	86·7	5·1	2·1	38·3
11 " -	67·5	3·5	6·5	27·0	97·3	25·3	5·6	34·8	88·6	5·8	2·8	39·1
12 " -	71·5	1·4	3·4	26·5	94·6	25·0	4·5	33·0	90·4	5·8	2·8	38·9
Means -	77·1	4·9	4·8	29·7	89·5	23·5	5·1	29·1	94·6	8·0	5·4	40·6

Table VII. (*concluded*).

Monthly Sums of Wind Components.

C.—Mundy Harbour, Boothia, Ship "Victory," 1831 September, to 1832 March—*concluded.*

Hours.	March, 1832.			
	N.	S.	E.	W.
1 a.m. - -	88·5	1·8	3·4	40·8
2 " - -	91·6	3·5	4·4	41·4
3 " - -	89·0	4·4	3·4	41·5
4 " - -	82·7	4·4	2·7	38·2
5 " - -	89·6	7·0	3·4	39·0
6 " - -	85·5	6·0	3·4	34·8
7 " - -	73·9	9·9	5·3	32·5
8 " - -	71·1	12·6	5·8	32·4
9 " - -	78·0	9·4	1·8	32·1
10 " - -	74·0	11·5	4·1	31·7
11 " - -	70·3	11·2	3·7	39·2
12 " - -	67·6	12·6	5·1	28·7
1 p.m. - -	69·9	12·2	4·2	29·0
2 " - -	71·5	12·2	4·2	30·4
3 " - -	72·2	12·0	4·2	31·9
4 " - -	71·0	15·5	2·5	34·7
5 " - -	71·6	11·5	3·9	34·5
6 " - -	68·5	9·9	5·6	34·2
7 " - -	70·1	5·5	6·6	31·1
8 " - -	69·7	3·7	5·3	33·7
9 " - -	74·9	5·3	2·4	35·1
10 " - -	75·1	4·3	9·0	30·9
11 " - -	81·6	1·5	4·9	33·6
12 " - -	82·3	2·2	8·3	33·6
Means - -	76·7	7·9	4·5	34·0

Table VIII.

Sums of Wind Components, Ship "Victory."

Hours.	A.—In Felix Harbour. For 365 Days. 1829 September, to 1830 August.				B.—In Victoria Harbour. For 365 Days. 1830 September, to 1831 August.				C.—In Mundy Harbour. For 213 Days. 1831 September, to 1832 March.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
1 a.m. -	515·1	125·2	108·8	251·6	446·0	196·2	112·0	357·5	523·2	102·1	38·5	183·5
2 „ -	533·9	133·5	117·6	257·9	451·3	203·5	121·7	353·8	542·7	107·6	37·4	194·3
3 „ -	536·6	135·2	120·7	264·4	444·1	195·1	124·9	370·4	551·3	101·1	39·1	203·7
4 „ -	504·3	124·2	115·8	264·0	445·4	205·6	119·3	334·9	544·0	86·1	40·7	181·1
„ -	486·8	133·6	113·7	257·4	439·7	199·9	115·2	361·3	555·9	79·9	40·9	196·6
6 „ -	507·0	126·2	115·6	259·6	449·6	204·6	118·0	380·1	559·2	87·7	47·4	201·4
7 „ -	494·5	122·9	118·0	242·7	431·9	195·9	113·2	369·4	533·8	95·5	54·9	190·7
8 „ -	493·8	128·6	120·6	238·3	419·2	197·9	118·1	349·2	533·2	93·2	53·3	187·5
9 „ -	494·9	152·4	116·1	262·6	422·9	197·1	126·2	337·1	538·5	77·8	35·3	194·4
10 „ -	494·6	155·0	121·9	265·8	430·5	204·2	124·9	346·5	531·9	86·5	37·5	197·3
11 „ -	487·2	166·3	123·6	256·1	428·3	222·7	128·1	350·8	526·4	93·4	38·7	203·4
12 „ -	477·5	167·6	127·0	245·6	426·2	229·7	124·9	359·9	515·5	102·7	42·5	194·4
1 p.m. -	479·5	156·0	130·9	234·3	423·9	220·8	117·2	336·2	501·9	88·3	50·9	186·8
2 „ -	485·1	172·6	126·7	241·4	428·6	220·4	120·5	323·4	494·6	102·9	49·2	183·5
3 „ -	478·0	170·9	132·2	254·4	444·2	216·4	127·7	321·2	502·5	103·7	42·8	185·5
4 „ -	470·2	154·7	114·6	267·0	450·9	202·7	127·5	337·3	505·7	99·5	43·8	193·9
5 „ -	456·4	139·5	118·6	239·4	426·7	187·1	116·3	324·4	477·3	84·3	49·4	181·0
6 „ -	457·9	139·5	133·1	227·8	421·6	188·1	112·3	328·0	474·1	82·1	52·7	175·7
7 „ -	442·7	131·9	119·3	234·8	419·4	173·4	108·2	324·4	482·7	77·6	56·8	175·3
8 „ -	444·0	130·7	126·1	234·4	411·4	180·0	107·1	307·9	484·6	79·8	62·1	177·3
9 „ -	456·8	131·5	118·5	230·6	411·2	167·2	104·7	307·4	473·2	68·7	47·6	165·4
10 „ -	480·1	140·9	114·7	244·3	432·8	174·7	111·0	326·6	481·9	68·8	54·6	172·0
11 „ -	495·3	147·5	112·2	259·2	420·0	187·6	127·7	334·0	504·9	73·1	44·3	185·9
12 „ -	504·8	135·2	109·0	234·8	428·7	183·5	128·2	317·3	511·1	76·5	46·3	191·9
Sums	11677·0	3421·6	2875·3	5968·4	10354·5	4754·3	2854·9	8159·0	12350·1	2118·9	1106·7	4502·5

Table IX.

Monthly Components and Resultants of the Winds, together with the Duration of Gales and Calms.

A.—Felix Harbour, Boothia, Ship "Victory," from 1829 September, to 1830 August.

Month.	Components.				Resultants.				Hours of Force 8 and upwards.	Hours of Calms.
	N.	S.	E.	W.	Direction.			Force.		
September 1829 -	2·65	0·62	0·47	0·99	N.	15°	W.	2·10	109	56
October „ -	1·33	0·34	0·28	1·35	N.	47	W.	1·45	14	59
November „ -	1·83	0·14	0·70	0·25	N.	15	E.	1·75	21	117
December „ -	1·05	0·60	0·22	0·77	N.	51	W.	0·72	—	163
January 1830 -	1·26	0·61	0·08	0·59	N.	38	W.	0·83	8	94
February „ -	0·77	0·52	0·27	0·30	N.	7	W.	0·29	—	175
March „ -	0·64	0·22	0·17	0·36	N.	24	W.	0·46	—	236
April „ -	1·26	0·57	0·44	0·87	N.	33	W.	0·82	19	50
May „ -	0·96	0·35	0·47	0·70	N.	21	W.	0·66	—	51
June „ -	0·96	0·35	0·42	0·66	N.	33	W.	0·66	—	74
July „ -	1·30	0·15	0·18	0·44	N.	12	W.	1·17	—	99
August „ -	1·97	0·25	0·25	0·85	N.	19	W.	1·84	14	28
Year - -	1·33	0·39	0·33	0·68	N.	20	W.	1·00	185	1202

B.—Victoria Harbour, Boothia, Ship "Victory," from 1830 September, to 1831 August.

September 1830 -	2·26	0·52	0·34	1·13	N.	24°	W.	1·90	52	17
October „ -	0·73	0·75	0·50	1·38	S.	89	W.	0·90	22	54
November „ -	1·10	0·37	0·33	0·46	N.	10	W.	0·74	19	112
December „ -	1·21	0·76	0·30	0·75	N.	43	W.	0·62	34	119
January 1831 -	1·36	0·40	0·06	0·95	N.	45	W.	1·28	20	131
February „ -	0·64	0·88	0·12	0·78	S.	70	W.	0·70	6	82
March „ -	0·40	0·56	0·13	0·75	S.	79	W.	0·64	13	177
April „ -	1·85	0·30	0·20	1·12	N.	31	W.	1·80	30	52
May „ -	1·54	0·29	0·46	0·82	N.	16	W.	1·30	3	71
June „ -	0·63	0·83	0·12	1·44	S.	82	W.	1·34	14	65
July „ -	1·35	0·47	0·69	0·59	N.	7		0·90	2	46
August „ -	1·05	0·41	0·62	1·03	N.	32	W.	0·78	—	44
Year - -	1·18	0·54	0·33	0·93	N.	44	W.	0·89	215	970

C.—Mundy Harbour, Boothia, Ship "Victory," from 1831 September, to 1832 March.

September 1831 -	2·81	0·34	0·34	0·96	N.	14°	W.	2·57	63	35
October „ -	1·93	0·47	0·25	0·51	N.	10	W.	1·48	47	60
November „ -	1·08	0·64	0·28	0·31	N.	5	W.	0·44	4	146
December „ -	2·49	0·16	0·15	0·96	N.	19	W.	2·46	107	153
January 1832 -	2·89	0·76	0·16	0·94	N.	20	W.	2·26	107	100
February „ -	3·26	0·28	0·19	1·40	N.	22	W.	3·22	90	78
March „ -	2·47	0·25	0·15	1·10	N.	23	W.	2·42	67	135
Mean - -	2·43	0·41	0·22	0·88	N.	18	W.	2·10	485	707

TABLE X.

MEAN MONTHLY SUMS OF WIND COMPONENTS, deduced from OBSERVATIONS made in the GULF OF BOOTHIA on board the "VICTORY," during the period 1829 September, to 1832 March, inclusive.

Hours.	1829–31.											
	September.				October.				November.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
1 a.m. -	81·5	18·2	11·6	34·6	47·0	18·9	11·6	37·6	43·2	13·1	13·0	11·1
2 „ -	84·6	18·2	10·9	34·4	49·5	18·7	11·8	37·8	45·4	15·7	14·5	10·8
3 „ -	88·4	16·7	11·3	35·4	50·1	19·6	10·5	39·0	43·7	14·7	14·8	12·6
4 „ -	85·4	13·3	10·9	28·9	49·3	19·2	10·8	38·0	42·6	14·5	15·3	11·2
5 „ -	80·5	11·6	10·8	28·8	47·2	17·0	11·6	36·0	42·2	14·6	13·1	10·1
6 „ -	83·3	13·0	9·4	30·8	46·8	17·3	11·8	37·9	43·0	14·8	13·9	10·8
7 „ -	78·5	12·9	11·5	29·4	43·1	15·9	11·4	35·1	37·6	14·5	12·8	10·6
8 „ -	78·2	12·1	11·1	28·7	43·0	16·1	11·5	33·9	35·9	12·0	12·7	9·4
9 „ -	78·5	13·9	10·9	31·7	39·8	15·1	8·5	34·8	37·7	9·6	10·7	9·6
10 „ -	79·6	13·4	10·4	33·3	40·7	15·6	7·9	38·1	40·1	9·1	11·9	10·7
11 „ -	77·6	14·1	11·3	33·4	37·9	17·6	7·1	34·4	41·2	7·8	12·2	12·2
12 „ -	77·2	14·9	12·6	34·4	37·5	17·1	7·8	33·6	41·3	8·6	13·4	12·0
1 p.m. -	76·9	17·4	12·6	29·2	34·7	16·4	8·8	30·3	39·1	7·8	12·6	11·0
2 „ -	77·2	19·0	12·3	27·2	31·6	17·8	8·2	28·2	40·8	9·7	13·3	10·2
3 „ -	77·5	18·7	12·4	24·6	33·2	17·4	7·7	27·0	40·1	9·7	11·4	9·4
4 „ -	76·9	17·1	12·1	26·6	35·3	14·6	7·4	28·0	39·5	10·4	11·6	10·2
5 „ -	68·5	16·5	13·0	25·8	34·6	12·0	8·9	29·8	38·9	12·9	13·0	7·9
6 „ -	67·6	14·0	10·9	26·6	34·6	12·9	10·4	29·9	39·1	11·5	13·1	8·8
7 „ -	67·6	12·2	11·2	26·3	38·4	12·8	12·3	29·8	34·7	9·9	13·4	8·6
8 „ -	67·0	13·4	11·8	29·0	40·2	11·7	12·8	28·9	35·2	10·6	14·0	8·4
9 „ -	70·8	11·1	11·4	32·6	41·1	14·8	14·2	31·7	40·6	9·5	13·5	7·8
10 „ -	74·6	12·7	12·8	32·1	41·9	17·6	13·7	34·8	40·4	10·1	14·4	11·1
11 „ -	76·6	15·0	12·7	36·3	45·5	16·1	14·1	34·1	39·9	11·6	12·0	11·0
12 „ -	78·5	14·5	10·5	37·9	46·3	15·7	13·4	33·6	39·7	13·0	13·8	11·0
Means	77·2	14·8	11·5	30·9	41·2	16·2	10·6	33·4	40·1	11·5	13·1	10·3

TABLE X. (*continued*).

MEAN MONTHLY SUMS OF WIND COMPONENTS, deduced from OBSERVATIONS made in the GULF OF BOOTHIA on board the "VICTORY," during the period 1829 September, to 1832 March, inclusive.

Hours.	December, 1829–31.				January, 1830–32.				February, 1830–32.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
1 a.m. -	52·0	15·1	8·7	23·6	54·3	17·9	3·8	19·1	45·6	15·3	3·5	22·9
2 „ -	50·5	15·3	8·5	24·5	55·1	17·4	3·8	19·8	48·4	15·6	3·7	23·1
3 „ -	53·3	15·2	10·6	25·3	53·7	17·1	3·8	20·0	47·9	14·4	4·6	25·1
4 „ -	53·3	12·5	7·9	24·5	54·0	17·4	3·7	18·9	49·6	14·1	5·2	24·9
5 „ -	51·8	14·4	6·3	26·4	54·4	18·9	2·3	23·1	49·9	14·9	4·4	24·5
6 „ -	50·8	14·9	6·2	26·6	54·5	19·6	3·2	24·4	51·7	15·5	4·7	25·7
7 „ -	50·6	14·7	6·2	24·7	55·5	19·2	3·9	22·7	50·5	16·2	4·7	25·4
8 „ -	51·5	17·5	7·3	25·5	53·1	18·4	3·8	20·7	50·2	15·9	5·6	24·7
9 „ -	51·2	17·3	6·6	26·6	55·0	17·1	0·9	24·3	48·5	18·0	7·8	23·4
10 „ -	51·2	15·7	6·6	26·6	52·3	18·1	0·9	25·8	46·9	19·4	6·7	21·5
11 „ -	51·7	18·1	5·8	26·9	54·7	18·5	0·6	29·8	44·0	19·9	7·0	20·7
12 „ -	52·0	18·4	5·6	27·0	53·7	19·2	1·3	28·9	42·0	20·1	6·9	20·2
1 p.m. -	51·6	17·2	5·7	27·7	59·6	18·3	3·3	31·6	41·1	16·6	8·3	20·4
2 „ -	50·2	16·9	5·8	27·8	59·2	20·2	3·1	32·2	40·2	18·2	7·8	21·2
3 „ -	48·9	15·2	6·8	27·4	61·2	19·9	3·6	36·6	42·5	18·8	6·9	23·3
4 „ -	51·4	14·8	8·1	27·7	59·2	17·4	3·6	36·1	42·9	17·6	4·9	24·2
5 „ -	46·4	17·0	8·8	26·0	56·3	17·6	2·8	26·3	44·6	12·2	5·1	24·2
6 „ -	45·7	16·5	6·0	24·1	57·2	19·8	3·7	26·4	44·9	12·4	5·4	24·3
7 „ -	45·4	16·4	5·8	24·6	61·5	18·5	4·4	27·7	43·7	13·9	5·5	26·7
8 „ -	46·3	16·2	6·2	27·1	61·9	18·4	5·0	25·8	40·7	14·2	4·5	26·1
9 „ -	41·7	15·2	6·9	22·2	58·7	16·7	3·1	22·3	37·2	10·9	4·1	21·7
10 „ -	42·3	12·0	6·9	21·9	61·2	16·4	3·2	23·2	38·3	13·2	3·7	23·4
11 „ -	43·3	14·5	8·6	22·2	59·2	18·6	4·6	24·7	41·2	13·8	4·2	25·8
12 „ -	44·4	14·5	7·6	21·3	59·2	17·7	4·6	24·9	40·3	15·0	5·7	25·1
Means -	49·1	15·6	7·0	25·3	56·8	18·2	3·2	25·6	44·7	15·7	5·5	23·7

TABLE X. (*continued*).

MEAN MONTHLY SUMS OF WIND COMPONENTS, deduced from OBSERVATIONS made in the GULF OF BOOTHIA on board the "VICTORY," during the period 1829 September, to 1832 March, inclusive.

Hours.	March, 1830-32.				April, 1830-31.				May, 1830-31.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
1 a.m. -	39·2	8·6	3·1	24·2	44·2	14·5	7·7	28·8	39·6	9·5	13·6	21·7
2 „ -	39·4	9·7	3·2	23·8	46·0	15·3	11·3	26·3	39·4	12·0	13·0	19·3
3 „ -	38·6	10·6	3·8	24·8	43·3	16·0	10·8	27·9	39·3	9·0	13·5	21·3
4 „ -	37·1	12·9	3·3	24·5	42·4	12·3	10·7	26·8	36·2	8·0	12·2	20·8
5 „	38·3	11·3	4·1	26·8	38·6	11·5	11·7	24·2	39·3	8·5	13·7	21·4
6 „ -	37·2	8·8	4·4	25·5	43·2	12·7	15·8	27·4	41·1	10·8	13·8	25·2
7 „ -	34·6	9·7	4·5	23·2	43·6	12·1	13·7	25·3	41·9	9·5	15·0	27·8
8 „ -	33·3	10·2	4·6	22·4	49·7	12·0	13·7	25·6	41·1	10·6	14·8	28·2
9 „ -	37·3	12·4	5·7	26·0	49·5	15·2	9·7	31·4	41·6	8·0	16·1	26·7
10 „ -	36·3	14·5	6·8	26·2	50·0	14·8	8·2	30·9	43·3	9·6	17·6	26·2
11 „ -	34·9	12·5	6·3	26·6	50·7	14·2	10·8	32·6	42·7	15·9	17·4	26·6
12 „ -	33·1	12·6	6·5	23·2	49·6	13·7	10·5	34·2	42·0	15·6	16·7	24·8
1 p.m. -	34·7	13·7	4·9	20·8	47·0	13·4	8·7	30·8	38·6	12·0	15·6	23·4
2 „ -	36·3	13·2	5·4	21·1	48·5	16·2	6·5	31·9	38·8	12·3	14·5	26·4
3 „ -	36·6	14·3	4·9	24·0	52·0	14·8	10·1	30·8	36·6	10·2	15·8	26·7
4 „ -	36·0	12·8	3·9	26·5	51·3	15·3	6·8	32·5	38·5	10·7	15·1	27·9
5 „ -	37·9	9·8	4·0	23·7	49·0	12·6	8·6	30·4	37·6	6·3	15·3	25·5
6 „ -	36·4	11·3	5·0	22·3	48·3	12·1	12·5	28·5	37·6	6·6	14·8	24·1
7 „ -	35·5	10·0	6·1	18·8	46·7	12·8	7·4	30·5	34·2	10·1	14·1	19·8
8 „ -	34·8	9·6	6·1	20·3	45·0	13·3	8·5	29·7	34·4	9·8	15·0	18·6
9 „ -	36·0	7·7	2·6	18·6	46·0	10·4	7·5	34·4	35·8	9·1	10·5	18·8
10 „ -	37·0	6·9	5·0	16·6	46·9	10·7	6·1	32·9	38·0	9·2	12·0	21·2
11 „ -	41·0	6·1	3·1	20·1	42·3	10·5	6·9	33·8	38·1	8·9	15·0	22 5
12 „ -	39·6	6·8	4·5	18·2	46·8	9·3	7·4	30·4	36·8	6·5	13·1	21·3
Means -	36·7	10·7	4·7	22·8	46·7	13·1	9·6	29·9	38·9	9·9	14·5	23·6

TABLE X. (*concluded*).

MEAN MONTHLY SUMS OF WIND COMPONENTS, deduced from OBSERVATIONS made in the GULF OF BOOTHIA on board the "VICTORY," during the period 1829 September, to 1832 March, inclusive.

Hours.	1830-31.											
	June.				July.				August.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
1 a.m. -	17·7	14·5	5·3	32·8	46·6	5·5	10·3	21·9	50·0	7·3	10·0	31·6
2 „ -	18·7	13·4	5·8	39·3	45·7	7·7	12·8	24·7	55·0	8·3	10·9	32·4
3 „ -	20·0	15·4	6·2	38·9	45·3	6·5	13·4	21·8	54·6	6·3	9·5	36·1
4 „ -	22·0	14·0	6·2	37·4	42·4	9·5	12·2	18·1	46·9	7·9	11·0	30·6
5 „ -	23·0	14·7	7·5	40·5	47·0	11·6	12·3	21·0	47·1	6·5	10·7	36·9
6 „ -	24·8	13·9	6·2	37·5	48·4	10·4	13·0	22·2	49·5	5·8	11·4	35·8
7 „ -	25·9	14·1	7·2	35·3	45·4	8·9	13·2	19·3	48·2	7·8	11·7	37·2
8 „ -	26·4	17·2	7·7	33·6	42·1	9·6	12·3	18·4	46·2	7·4	12·9	33·7
9 „ -	27·1	19·3	9·0	29·6	41·3	7·4	14·6	18·0	46·7	8·9	12·8	26·4
10 „ -	26·9	20·6	9·8	27·8	40·7	8·5	14·7	20·1	47·2	10·8	15·0	26·5
11 „ -	27·7	22·9	9·7	28·4	40·5	13·0	15·1	17·2	46·4	12·5	16·7	24·4
12 „ -	27·8	26·5	9·8	30·2	39·3	14·0	14·9	16·0	45·6	14·0	14·1	26·0
1 p,m. -	22·8	20·8	11·3	31·0	42·2	13·5	14·5	12·5	45·5	11·8	15·3	24·6
2 „ -	22·8	21·0	12·2	29·4	42·9	14·4	14·9	9·6	48·0	11·6	16·2	25·2
3 „ -	22·8	21·9	12·7	29·1	41·2	16·7	15·1	9·5	49·8	11·0	17·2	26·0
4 „ -	23·9	19·6	11·4	30·8	40·8	11·2	15·3	12·7	47·3	14·9	17·1	27·0
5 „ -	23·8	18·9	9·9	32·1	36·5	6·6	12·2	13·9	42·8	14·3	17·8	25·0
6 „ -	23·7	19·6	9·4	31·4	35·4	6·5	12·5	13·5	43·4	12·6	18·3	24·9
7 „ -	23·7	12·9	6·8	28·2	32·9	6·0	12·5	13·8	44·7	9·2	13·4	26·7
8 „ -	23·9	12·4	7·2	25·8	34·2	8·2	11·7	10·5	43·4	10·4	13·8	26·4
9 „ -	24·3	16·9	5·9	26·7	37·0	7·8	15·0	10·5	38·4	10·5	12·9	26·1
10 „ -	26·0	17·0	5·9	28·2	41·2	8·9	14·7	13·4	42·0	13·2	12·3	31·2
11 „ -	23·1	19·5	6·5	26·1	40·4	8·8	14·0	12·4	46·3	13·0	11·0	33·4
12 „ -	25·1	16·3	5·6	25·7	40·6	9·4	14·2	10·9	51·1	10·5	11·4	25·7
Means -	23·9	17·6	8·1	31·5	41·2	9·6	13·6	15·9	46·9	10·3	13·4	29·1

TABLE XI.

SUMS OF THE MEAN MONTHLY SUMS OF THE WIND COMPONENTS, with the MEAN DIURNAL RESULTANTS of the WIND, deduced from OBSERVATIONS made in the GULF OF BOOTHIA on board the "VICTORY," during the period 1829 September, to 1832 March, inclusive.

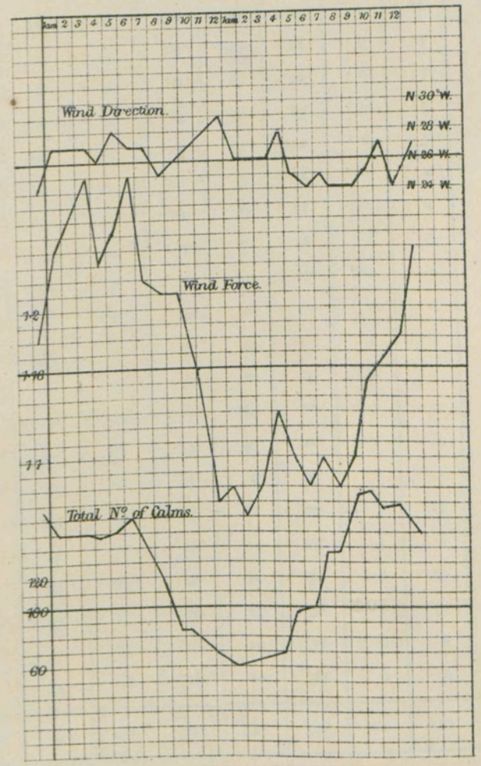
Hours.	Components for Year.				Resultant.			
	N.	S.	E.	W.	Direction.			Force.*
1 a.m. - -	560·9	158·4	102·2	309·9	N.	27°	W.	1·24
2 „ - -	577·7	167·3	110·2	316·2	N.	27	W.	1·26
3 „ - -	578·2	161·5	112·8	328·2	N.	27	W.	1·29
4 „ - -	561·2	155·9	109·4	304·6	N.	26	W.	1·23
5 „ - -	559·3	155·5	108·5	319·7	N.	28	W.	1·25
6 „ - -	574·3	157·2	113·8	329·8	N.	27	W.	1·29
7 „ - -	555·4	155·5	115·8	316·0	N.	27	W.	1·22
8 „ - -	550·7	159·0	118·0	304·8	N.	25	W.	1·21
9 „ - -	554·2	162·2	113·3	308·5	N.	26	W.	1·21
10 „ - -	555·2	170·1	116·5	313·7	N.	27	W.	1·18
11 „ - -	550·0	187·0	120·0	313·2	N.	28	W.	1·13
12 „ - -	541·1	194·7	120·1	310·5	N.	29	W.	1·07
1 p.m. - -	533·8	178·9	121·6	293·3	N.	26	W.	1·08
2 „ - -	536·5	190·5	120·2	290·4	N.	26	W.	1·06
3 „ - -	542·4	188·6	124·6	294·4	N.	26	W.	1·08
4 „ - -	543·0	176·4	117·3	310·2	N.	28	W.	1·13
5 „ - -	516·9	156·7	119·4	290·6	N.	25	W.	1·10
6 „ - -	513·9	155·8	122·0	284·8	N.	24	W.	1·08
7 „ - -	509·0	144·7	112·9	284·5	N.	25	W.	1·10
8 „ - -	507·0	148·2	116·6	276·5	N.	24	W.	1·08
9 „ - -	507·6	140·6	107·6	273·4	N.	24	W.	1·10
10 „ - -	529·8	147·9	110·7	290·0	N.	25	W.	1·15
11 „ - -	536·9	156·4	112·7	302·4	N.	27	W	1·17
12 „ - -	548·4	148·2	111·8	286·0	N.	24	W.	1·18
Mean - -	543·4	163·2	114·9	302·1	N.	26	W.	1·16

* Mean Force by Beaufort's Scale.

Diagram No. 2.

MEAN DIURNAL CHANCES OF THE WIND IN THE GULF OF BOOTHIA.

1829 September to 1832 March.



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DANCERFIELD LITH. 22, BEDFORD ST. COVENT GARDEN.

Table XII.

Total Hourly Calms at the Gulf of Boothia, Ship "Victory," during the period from 1829 September, to 1832 March.

Hours.	Sept. (90 days.)	Oct. (93 days.)	Nov. (90 days.)	Dec. (93 days.)	Jan. (93 days.)	Feb. (85 days.)	March. (93 days.)	April. (60 days.)	May. (62 days.)	June. (60 days.)	July. (62 days.)	Aug. (62 days.)	Totals. (943 days.)
1 a.m. -	6	6	21	21	16	22	24	6	7	6	8	7	150
2 „ -	6	7	20	21	15	20	26	8	9	5	6	6	149
3 „ -	5	8	24	21	18	17	24	7	8	4	6	8	150
4 „ -	5	7	25	22	20	16	20	6	8	6	7	5	147
5 „ -	6	8	20	24	16	20	25	9	7	7	7	—	149
6 „ -	6	9	20	24	18	19	28	8	7	9	8	1	157
7 „ -	7	9	19	23	14	16	25	7	5	7	4	2	138
8 „ -	4	5	16	20	18	11	22	6	3	6	6	2	119
9 „ -	2	7	14	11	11	9	18	—	4	3	5	1	85
10 „ -	1	9	13	12	10	8	18	—	4	4	3	1	83
11 „ -	1	7	9	12	9	8	18	1	3	4	2	—	74
12 „ -	1	7	10	11	7	10	16	—	2	1	2	—	67
1 p.m. -	1	6	8	11	4	6	13	1	1	3	4	1	59
2 „ -	1	7	10	11	5	5	13	1	1	3	4	1	62
3 „ -	1	7	13	9	6	6	13	2	1	3	4	2	67
4 „ -	3	7	11	10	7	10	12	2	1	3	3	2	71
5 „ -	3	6	13	16	13	10	20	1	2	5	7	1	97
6 „ -	3	8	13	16	11	9	23	1	1	5	7	3	100
7 „ -	7	9	15	16	17	12	27	3	5	12	7	5	135
8 „ -	7	10	14	17	17	14	23	3	5	13	9	4	136
9 „ -	8	5	18	25	18	24	34	8	10	9	8	6	173
10 „ -	8	5	17	27	20	24	38	7	11	8	8	4	177
11 „ -	9	6	17	27	17	19	33	8	8	7	11	4	166
12 „ -	7	8	15	28	18	20	35	7	9	6	9	6	168
Sums -	108	173	375	435	325	335	548	102	122	139	145	72	2879
Means -	4·5	7·2	15·5	18·1	13·5	14·0	22·8	4·3	5·1	5·8	6·0	3·0	120·0

Table XIII.

Summary of Winds referred to Sixteen Points, with Mean Force (Scale 0 to 12).

A.—Felix Harbour, Boothia.

Months.	Total No. of Observations.	N.		N.N.E.		N.E.		E.N.E.		E.		E.S.E.		S.E.		S.S.E.	
		*O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.
1829.																	
September	720	141	4·8	54	4·7	24	2·6	27	2·3	4	2·0	9	1·9	33	4·0	15	2·9
October	744	47	2·6	30	3·6	6	4·3	14	4·8	14	4·8	—	—	14	1·1	5	3·2
November	720	92	5·0	190	3·0	109	2·6	31	1·5	5	1·0	11	3·2	3	2·0	—	—
December	744	101	1·9	61	2·6	21	3·7	—	—	15	2·1	4	1·5	—	—	6	4·0
1830.																	
January	744	169	3·3	28	2·6	—	—	5	2·0	8	1·0	—	—	7	1·0	16	1·8
February	672	97	2·2	93	2·4	55	1·9	9	1·1	2	1·0	1	2·0	6	1·0	—	—
March	744	119	1·9	42	2·4	44	2·2	4	1·0	14	1·0	—	—	4	1·0	4	1·0
April	720	75	3·2	105	2·8	60	3·0	—	—	17	1·7	—	—	8	1·4	19	3·6
May	744	57	2·3	112	2·4	51	1·4	6	1·0	53	2·7	5	1·6	32	2·0	4	2·0
June	720	50	2·8	145	2·4	124	1·6	13	1·0	16	1·0	—	—	3	1·0	2	1·0
July	744	194	2·5	121	1·3	36	1·5	4	1·5	8	1·0	—	—	29	1·2	6	1·2
August	744	178	2·5	21	3·6	69	2·8	1	1·0	—	—	—	—	15	1·1	4	3·0

(*continued.*)

Months.	S.		S.S.W.		S.W.		W.S.W.		W.		W.N.W.		N.W.		N.N.W.		Variable.		No. of Calms.
	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	
1829.																			
September	34	5·0	28	2·9	20	3·3	4	5·7	10	1·9	45	3·9	40	5·1	157	4·9	19	1·2	56
October	22	3·1	21	2·3	37	3·1	18	4·8	58	2·3	67	2·1	223	3·1	75	2·6	34	1·4	59
November	31	1·1	13	1·0	32	1·3	8	1·3	—	—	35	2·1	27	3·5	8	1·6	8	1·0	117
December	73	2·2	38	2·7	75	3·2	—	—	42	2·2	6	3·2	68	3·6	58	3·7	13	1·2	163
1830.																			
January	50	1·4	75	2·0	133	2·2	—	—	20	1·7	—	—	21	1·4	107	2·7	11	1·1	94
February	96	1·4	40	2·6	62	2·6	7	2·1	7	3·0	—	—	1	2·0	8	2·0	13	1 0	175
March	23	1·4	23	2·3	75	1·2	11	1·9	46	1·8	20	1·3	46	1·2	25	2·1	8	1·4	236
April	36	1·9	31	2·1	83	2·6	36	4·4	49	2·6	20	3·8	33	1·8	94	2·2	4	2·8	50
May	60	1·4	24	1·5	39	2·2	21	2·7	55	2·4	48	2·6	58	2·1	67	2·2	1	2·0	51
June	38	1·4	52	2·0	58	2·2	7	1·3	85	3·4	2	2·5	21	1·3	25	2·6	5	1·0	74
July	23	1·4	18	1·5	19	1·8	8	1·6	41	2·3	4	3·5	43	2·5	88	2·7	3	1·0	99
August	64	1·4	15	2·1	23	2·0	9	3·2	36	2·2	9	2·4	86	3·7	161	4·0	25	1·0	28

* O signifies the number of observations, F the mean force.

Table XIII. (*continued*).

Summary of Winds referred to Sixteen Points, with Mean Force (Scale 0 to 12).

B.—Victoria Harbour, Boothia.

Months.	Total No. of Observations.	N.		N.N.E.		N.E.		E.N.E.		E.		E.S.E.		S.E.		S.S.E.	
		O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.
1830.																	
September	720	124	5·3	31	4·0	29	3·2	17	3·8	13	3·5	5	1·0	7	2·0	12	2·2
October	744	17	2·3	33	4·1	22	4·0	1	2·0	43	3·5	3	2·0	45	2·7	11	2·2
November	720	148	3·3	6	2·8	10	2·4	4	5·5	26	2·5	15	3·2	44	2·5	14	1·6
December	744	42	5·1	4	3·0	—	—	—	—	20	2·3	12	3·2	64	2·4	32	1·9
1831.																	
January	744	97	2·8	12	2·7	4	1·0	—	—	3	1·0	2	1·5	20	1·0	13	2·5
February	672	41	3·2	3	3·3	4	2·0	4	1·0	3	2·3	5	1·0	30	2·5	7	2·4
March	744	20	2·2	3	2·3	15	2·1	6	3·3	15	1·3	6	1·5	14	1·9	14	1·6
April	720	106	3·4	37	2·8	11	1·4	6	2·3	20	2·4	3	1·0	12	1·5	14	2·9
May	744	126	3·5	46	2·3	39	3·7	11	2·5	18	3·7	16	3·8	34	1·5	21	1·8
June	720	43	2·9	2	4·0	7	1·3	—	—	4	4·2	4	4·5	22	1·7	14	2·3
July	744	113	2·5	75	3·6	83	2·2	16	2·2	70	1·6	16	2·2	43	2·3	38	2·1
August	744	83	3·4	19	2·3	57	2·1	37	2·8	62	2·7	22	3·2	24	1·2	13	1·9

(*continued.*)

Months.	S.		S.S.W.		S.W.		W.S.W.		W.		W.N.W.		N.W.		N.N.W.		Variables.		No. of Calms.
	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	
1830.																			
September	96	2·0	23	2·8	20	2·7	49	2·4	60	2·5	36	2·7	51	4·4	119	5·2	11	1·3	17
October	56	2·9	15	2·4	80	3·4	46	3·3	117	2·9	71	2·4	103	2·3	19	4·5	8	1·4	54
November	59	1·3	23	2·2	37	1·1	—	—	68	1·1	19	1·3	71	2·6	40	3·4	24	1·1	112
December	124	2·1	30	2·3	43	1·6	29	1·4	50	1·6	10	2·3	56	2·0	103	6·1	6	1·0	119
1831.																			
January	103	1·4	4	1·0	72	2·0	5	1·8	42	2·1	12	3·6	132	3·5	87	4·4	5	1·0	131
February	110	2·2	42	2·9	101	2·2	21	2·9	41	1·4	13	2·1	97	2·0	40	3·7	28	1·3	82
March	107	1·5	18	2·9	80	1·9	26	3·9	58	1·6	20	3·1	94	2·1	33	2·6	38	1·3	177
April	63	1·7	19	1·4	29	1·3	15	1·5	32	3·7	31	3·4	130	3·6	127	4·1	13	1·9	52
May	24	1·4	11	1·1	43	2·3	14	2·1	68	2·6	27	2·2	73	2·7	88	3·9	14	1·0	71
June	73	2·2	27	2·1	137	3·0	38	2·2	83	3·5	55	3·0	104	2·4	32	2·4	10	1·1	65
July	56	2·3	1	1·0	26	2·7	6	3·2	22	4·1	31	4·0	37	3·1	61	3·6	4	3·5	46
August	62	1·9	14	1·5	26	3·0	28	4·1	66	4·0	45	3·9	62	2·3	63	2·7	17	1·6	44

Table XIII. (*concluded*).

Summary of Winds referred to Sixteen Points, with Mean Force (Scale 0 to 12).

C.—Mundy Harbour, Boothia.

Months.	Total No. of Observations.	N.		N.N.E.		N.E.		E.N.E.		E.		E.S.E.		S.E.		S.S.E.	
		O.	F.	O.	F.	O.	F.	O.	F.	O	F.	O.	F.	O.	F.	O.	F.
1831.																	
September	720	124	5·5	42	4·4	15	2·8	6	4·3	32	2·3	15	2·3	17	1·3	1	1·0
October	744	192	4·2	18	3·3	11	3·6	3	1·0	29	1·8	16	1·4	30	2·0	35	1·2
November	720	135	3·9	—	—	3	2·3	2	3·0	20	1·7	5	1·2	79	1·7	75	1·9
December	744	88	5·4	1	5·0	6	1·0	—	—	54	1·1	4	1·0	50	1·2	12	1·0
1832.																	
January	744	147	5·9	4	3·5	4	1·2	—	—	3	1·0	3	1·0	38	2·2	32	4·2
February	696	20	3·0	2	2·0	6	1·0	—	—	29	2·1	3	1·0	44	1·7	13	1·4
March	744	15	1·6	1	3·0	11	1·4	—	—	32	1·2	6	1·5	42	1·2	22	1·7

(*continued.*)

Months.	S.		S.S.W.		S.W.		W.S.W.		W.		W.N.W.		N.W.		N.N.W.		Variable.		No of Calms.
	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	
1831.																			
September	49	2·2	18	2·8	20	2·7	18	2·0	23	1·5	10	2·3	52	3·5	209	5·1	34	1·2	35
October	76	1·7	38	2·0	36	2·0	14	1·9	24	1·7	2	1·0	7	2·1	132	4·3	21	1·6	60
November	81	1·8	18	4·1	9	1·7	4	2·2	21	2·0	3	1·7	44	1·9	54	3·6	21	1·4	146
December	30	1·7	—	—	5	3·6	2	1·5	9	1·1	—	—	70	4·1	211	5·9	49	1·0	153
1832.																			
January	64	2·3	48	4·4	12	4·3	—	—	9	2·5	4	1·0	23	3·6	238	5·4	15	1·1	100
February	34	2·6	7	3·1	4	4·0	—	—	8	1·3	—	—	20	3·9	424	5·5	4	2·0	78
March	31	1·5	21	3·3	5	1·4	—	—	9	1·4	1	6·0	34	1·7	371	5·1	8	1·0	135

Table XIV.

Summary of Wind Observations in the Gulf of Boothia, during the whole period from 1829 September, to 1832 March inclusive.

Months.	Total Observations.	N.		N.N.E.		N.E.		E.N.E.		E.		E.S.E.		S.E.		S.S.E.	
		O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.
1829–31.																	
September	2160	389	5·6	127	4·4	68	2·9	50	3·1	49	2·6	29	2·0	57	2·9	28	2·5
October	2232	256	3·8	81	3·7	39	4·0	18	4·0	86	3·2	19	1·5	89	2·2	51	1·6
November	2160	375	3·9	196	3·0	122	2·5	37	2·0	51	2·1	31	2·9	126	2·0	89	1·9
December	2232	231	3·8	66	2·7	27	3·1	—	—	89	1·5	20	2·4	114	1·9	50	1·9
1830–32.																	
January	2232	413	3·6	44	2·7	8	1·1	5	2·0	14	1·0	5	1·2	65	1·7	61	3·2
February	2040	158	2·5	98	2·6	65	1·8	13	1·1	34	2·0	9	1·1	80	2·1	20	1·7
March	2232	154	1·9	46	2·4	70	2·1	10	2·4	61	1·2	12	1·5	60	1·4	40	1·5
1830–31.																	
April	1440	181	3·3	142	2·8	71	2·7	6	2·3	37	2·1	3	1·0	20	1·4	33	3·3
May	1488	183	3·2	158	2·4	90	2·4	17	2·1	71	3·0	21	3·3	66	1·8	25	1·8
June	1440	93	2·8	147	2·4	131	1·6	13	1·0	20	1·6	4	4·5	25	1·6	16	2·1
July	1488	307	2·2	196	2·1	119	2·0	20	2·0	78	1·6	16	2·2	72	1·9	44	2·0
August	1488	261	2·8	40	3·0	126	2·5	38	2·8	62	2·7	22	3·2	39	1·2	17	2·2

(*continued.*)

Months.	S.		S.S.W.		S.W.		W.S.W.		W.		W.N.W.		N.W.		N.N.W.		Variables.		No. of Calms.
	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	
1829–31.																			
September	179	2·7	69	2·8	60	2·9	71	2·5	93	2·2	91	3·3	143	4·3	485	5·0	64	1·2	108
October	154	2·3	74	2·2	153	3·0	78	3·4	199	2·6	140	2·2	333	2·8	226	3·8	63	1·5	173
November	171	1·5	54	2·5	78	1·3	12	1·6	89	1·4	57	1·8	142	2·6	102	3·4	53	1·2	375
December	227	2·0	68	2·5	123	2·7	31	1·4	101	1·8	16	2·6	194	3·3	372	5·6	68	1·0	435
1830–32.																			
January	217	1·7	127	2·9	217	2·2	5	1·8	71	2·1	16	2·9	176	3·3	432	4·6	31	1·1	325
February	240	1·9	89	2·8	167	2·4	28	2·7	56	1·6	13	2·1	118	2·3	472	5·3	45	1·3	335
March	161	1·5	62	3·1	160	1·6	37	3·3	113	1·7	41	2·3	174	1·8	429	4·7	54	1·5	548
1830–31.																			
April	99	6·9	50	1·9	112	2·3	51	3·5	81	3·0	51	3·6	163	3·2	221	3·2	17	2·1	102
May	84	1·4	35	1·4	82	2·2	35	2·5	123	2·5	75	2·4	131	2·4	155	3·3	15	1·0	122
June	111	1·9	79	2·0	195	2·7	45	2·1	168	3·4	57	3·0	125	2·2	57	2·5	15	1·1	139
July	79	2·1	19	1·5	45	2·3	14	2·4	63	2·9	35	4·0	80	2·8	149	3·1	7	2·4	145
August	126	1·6	29	2·0	49	2·5	37	3·9	102	3·3	54	3·6	148	3·1	224	3·6	42	1·3	72

Table XV.

State of the Sky.

A.—Felix Harbour, Boothia, Ship "Victory," 1829 September, to 1830 August.

b = number of hours of blue sky or clear weather.
o = ——————— of overcast, dull, or gloomy weather.
c = ——————— of detached cloud, or fair weather, would be the remaining hours of the month in each case.

Hours.	1829.								1830.															
	Sept.		Oct.		Nov.		Dec.		Jan.		Feb.		March.		April.		May.		June.		July.		Aug.	
	b.	o.	b.	o.	b.	o.	b.	o.	b.	o.	b.	o.	b.	o.	b.	o.	b.	o.	b.	o.	b.	o.	b.	o.
1 a.m.	9	16	11	19	14	15	23	7	21	9	18	10	24	6	13	16	16	13	9	11	17	8	8	8
2 „	9	16	12	15	14	15	23	8	21	9	18	10	24	6	11	16	15	14	8	13	17	7	7	8
3 „	6	21	13	17	15	14	21	9	21	9	19	9	23	7	10	17	16	14	8	14	18	8	8	7
4 „	6	22	14	16	15	14	23	8	21	9	19	9	23	7	13	15	17	12	9	15	19	7	9	8
5 „	8	17	15	15	16	13	19	11	19	11	17	11	22	9	12	18	16	12	9	14	19	7	9	6
6 „	7	15	15	15	14	16	19	11	18	13	16	12	22	9	12	18	15	12	13	12	18	8	8	4
7 „	8	17	17	14	15	15	21	9	19	12	16	12	20	11	11	18	15	12	12	13	17	9	10	6
8 „	8	17	14	17	14	16	21	9	20	11	17	11	19	12	12	17	16	9	12	14	17	8	10	7
9 „	11	15	14	15	16	14	16	14	16	15	16	11	19	11	15	15	18	9	13	13	18	8	11	5
10 „	13	13	15	13	16	14	15	15	15	16	18	9	17	13	13	16	18	9	12	12	18	9	10	5
11 „	13	12	15	13	16	14	16	14	15	16	19	8	17	13	12	17	18	10	13	11	18	10	10	6
12 „	11	14	14	14	15	15	16	14	15	16	19	8	17	13	13	16	18	9	14	9	18	10	9	6
1 p.m.	14	10	12	17	13	16	17	13	13	18	18	9	16	15	14	15	20	9	14	11	20	8	10	4
2 „	13	12	13	17	13	16	17	13	14	17	18	9	17	13	14	15	20	9	13	13	20	9	10	5
3 „	11	13	11	19	13	15	17	13	15	16	16	11	15	15	14	16	20	9	12	14	19	8	11	7
4 „	11	14	10	20	13	17	17	14	15	16	16	11	18	12	14	16	18	10	12	14	20	5	11	7
5 „	13	11	10	21	13	16	19	12	19	11	16	11	15	14	14	16	18	10	13	14	18	7	9	7
6 „	14	11	12	19	12	17	21	10	19	11	17	11	17	12	14	16	16	12	15	13	19	7	9	7
7 „	10	14	14	16	14	16	25	6	17	13	20	8	16	14	14	16	17	13	12	12	19	8	7	9
8 „	10	14	14	16	15	15	25	6	19	11	21	7	16	14	13	17	15	15	12	11	19	9	7	11
9 „	9	12	15	15	13	17	22	9	22	8	17	11	19	11	13	17	14	16	11	10	18	7	8	10
10 „	10	12	15	15	13	16	22	9	22	8	17	11	19	11	14	16	13	17	12	9	17	8	9	10
11 „	9	14	15	15	15	15	21	10	22	8	16	12	21	9	13	15	12	17	11	11	17	9	8	11
12 „	9	16	14	16	15	15	21	10	22	8	17	11	21	9	15	13	12	16	10	9	17	8	8	11
Means	10·1	14·5	13·5	16·2	14·3	15·2	19·9	10·6	18·3	12·1	17·5	10·1	19·0	11·1	13·0	16·1	16·4	12·0	11·6	12·2	18·2	8·0	9·0	7·3

Table XV. (*continued*).

State of the Sky.

B.—Victoria Harbour, Boothia, Ship "Victory," 1830 September, to 1831 August.

b = number of hours of blue sky or clear weather.
o = ——————— of overcast, dull, or gloomy weather.
c = ——————— of detached cloud, or fair weather, would be the remaining hours of the month in each case.

Hours.	1830.								1831.															
	Sept.		Oct.		Nov.		Dec.		Jan.		Feb.		March.		April.		May.		June.		July.		Aug.	
	b.	o.	b.	o.	b.	o.	b.	o.	b.	o.	b.	o.	b.	o.	b.	o.	b.	o.	b.	o.	b.	o.	b.	o.
1 a.m.	5	10	7	19	13	15	16	12	14	14	19	8	24	5	14	12	18	9	9	7	10	11	7	11
2 „	5	10	7	19	12	15	16	12	15	13	18	9	24	5	13	12	18	9	9	8	11	10	6	10
3 „	5	10	8	17	13	14	16	11	13	14	17	9	25	4	14	12	18	9	11	8	11	10	7	9
4 „	4	10	10	16	12	16	18	10	15	14	18	10	23	4	14	13	18	9	11	8	11	10	8	9
5 „	3	11	10	19	15	12	13	17	16	13	18	10	18	11	12	15	18	9	10	10	11	13	11	12
6 „	3	13	11	18	16	10	13	16	16	12	16	12	18	11	12	16	18	9	11	8	11	13	12	12
7 „	5	13	12	16	15	10	13	17	15	14	15	12	17	12	12	16	19	7	12	8	12	13	10	14
8 „	4	9	13	15	14	10	13	18	14	16	16	12	17	13	12	16	19	8	12	10	12	11	10	11
9 „	4	9	13	14	12	14	11	19	13	15	15	13	20	11	13	15	19	8	11	9	13	8	13	10
10 „	5	9	16	12	12	14	11	19	13	15	15	12	22	9	16	12	20	6	15	8	12	9	13	9
11 „	6	10	15	13	11	14	10	19	13	15	15	12	24	6	16	11	18	8	14	8	14	8	13	10
12 „	6	11	15	12	13	13	8	19	13	15	15	11	24	6	17	10	21	4	15	7	15	7	12	10
1 p.m.	6	11	14	12	13	14	13	16	12	15	16	11	25	5	16	11	21	3	14	9	15	6	12	7
2 „	5	10	14	12	14	12	13	16	12	15	17	10	25	5	17	11	20	4	13	9	15	7	11	8
3 „	4	10	14	11	13	15	12	18	12	16	16	11	25	5	17	11	21	4	14	9	14	7	12	8
4 „	2	11	12	13	14	13	11	18	12	16	16	11	24	5	16	11	20	5	14	9	14	6	12	8
5 „	3	12	9	16	17	11	14	15	10	17	15	11	22	6	17	11	20	5	14	9	14	7	14	7
6 „	1	11	8	17	18	9	14	15	11	16	16	9	23	5	18	10	20	6	14	8	14	6	13	7
7 „	—	12	10	17	16	11	14	14	11	17	19	8	24	6	16	11	19	7	15	7	12	6	14	7
8 „	1	12	11	16	17	11	14	15	12	15	20	7	24	6	16	11	19	8	15	7	12	8	14	7
9 „	3	13	10	16	16	13	17	12	14	16	21	7	26	4	15	13	18	9	13	9	11	9	12	7
10 „	3	14	9	15	16	13	20	9	13	14	23	5	24	3	15	11	17	11	13	9	10	12	10	7
11 „	4	7	7	17	15	13	21	9	15	13	22	6	24	3	14	12	18	10	12	11	10	14	9	7
12 „	5	6	8	19	15	13	21	9	14	14	23	5	26	1	13	14	17	11	12	9	11	12	8	8
Means	3·8	10·6	11·0	15·4	14·3	12·7	14·2	14·8	13·3	14·6	17·6	9·6	22·8	6·3	14·8	12·4	18·9	7·4	12·6	8·5	12·3	9·3	11·0	8·9

Table XV. (*concluded.*)

State of the Sky.

C.—Mundy Harbour, Boothia, Ship "Victory," 1831 September, to 1832 March.

b = number of hours of blue sky or clear weather.
o = ———— overcast, dull, or gloomy weather.
c = ———— of detached cloud or fair weather would be the hours of the month in each case.

Hours.	1831.								1832.					
	Sept.		Oct.		Nov.		Dec.		Jan.		Feb.		March.	
	b.	o.	b.	o.	b.	o.	b.	o	b.	o.	b.	o.	b.	o.
1 a.m -	10	15	16	14	8	19	26	2	19	5	24	1	28	3
2 „ -	9	12	15	14	10	17	26	3	20	5	26	1	28	3
3 „ -	10	13	11	18	10	15	25	2	20	6	26	1	28	2
4 „ -	9	12	8	20	10	15	25	2	20	7	24	2	27	3
5 „ -	7	14	8	19	10	16	25	4	19	8	24	1	26	4
6 „ -	7	14	8	18	11	16	25	4	18	9	24	1	26	4
7 „ -	8	14	9	18	11	17	25	5	16	10	20	3	25	4
8 „ -	8	13	10	19	13	13	24	5	16	13	19	4	25	5
9 „ -	9	12	8	19	12	12	19	4	12	12	16	6	23	6
10 „ -	9	12	9	18	11	12	18	2	11	13	19	5	23	6
11 „ -	10	11	8	18	10	11	17	3	11	13	18	5	23	4
12 „ -	10	11	7	17	10	13	18	2	11	13	19	4	24	4
1 p.m. -	9	15	8	17	10	9	18	4	12	14	20	3	22	4
2 „ -	8	16	9	16	11	10	17	4	13	13	19	3	21	4
3 „ -	7	15	9	16	11	10	17	4	12	12	19	3	21	4
4 „ -	8	14	9	16	11	10	15	6	13	11	20	3	20	5
5 „ -	8	13	10	17	13	10	24	3	17	8	19	1	21	5
6 „ -	8	9	10	17	15	12	26	2	17	9	21	1	22	5
7 „ -	7	13	9	20	12	15	25	2	18	8	22	2	24	4
8 „ -	8	13	10	19	13	15	25	3	18	8	24	3	25	3
9 „ -	10	15	9	21	12	16	26	4	19	8	24	1	28	3
10 „ -	9	16	8	20	11	17	26	4	19	8	24	2	27	2
11 „ -	9	16	10	19	11	16	26	4	20	6	24	1	27	2
12 „ -	9	13	10	19	11	18	26	4	20	6	24	2	26	2
Means -	8·6	13·4	9·5	17·9	11·1	13·9	22·7	3·4	16·3	9·4	21·6	2·5	24·6	3·8

Table XVI.

Temperature of the Sea, near or in Felix Harbour, Boothia, Ship "Victory," 1829, September.

Hours.	Means.
	°
1	29·7
2	29·7
3	29·7
4	29·8
5	29·9
6	29·9
7	30·0
8	30·0
9	30·5
10	30·5
11	30·7
Noon	30·7
1	30·7
2	30·7
3	30·7
4	30·7
5	30·5
6	30·5
7	29·9
8	29·9
9	29·7
10	29·7
11	29·7
Midn.	29·5
Mean -	30·1

Table XVII.

Hours of Mist, Fog, Rain, Snow, Squalls, and Snowdrift noted at:

A.—Felix Harbour, Boothia, Ship "Victory," from 1829 September, to 1830, August.

Months.	Mist.	Fog.	Rain.	Snow.	Squalls.	Drift.	—
September 1829 -	29	99	46	114	150	—	
October „ -	1	—	3	189	—	—	
November „ -	—	—	—	157	—	—	
December „ -	—	—	—	*55	3	8	* Noted "hail" 21 times.
January 1830 -	1	—	—	61	11	25	
February „ -	—	—	—	27	10	—	
March „ -	6	5	—	*117	—	—	* Noted "hail" 3 times.
April „ -	—	—	—	175	9	—	
May - „ -	—	40	—	68	—	—	
June „ -	10	98	28	*80	7	—	* Hail once.
July - „ -	—	32	*97	—	13	—	* Hail once.
August „ -	—	46	83	—	23	—	
Year - - -	47	320	257	1,043	226	33	

B.—Victoria Harbour, Boothia, Ship "Victory," 1830 September, to 1831 August.

September 1830 -	—	1	—	*167	69	—	* Hail once.
October „ -	—	2	—	125	11	2	
November „ -	—	—	—	105	—	9	
December „ -	—	—	—	144	6	53	
January 1831 -	—	—	—	*85	10	48	* Hail once.
February „	—	—	—	69	2	35	
March „ -	—	—	—	66	—	35	
April „ -	7	22	—	86	—	99	
May „ -	—	—	—	82	—	69	
June „ -	—	14	14	86	—	46	
July „ -	19	39	65	28	10	—	
August „ -	—	145	63	*50	6	—	* Hail 7 times.
Year - - -	26	224	142	1,093	114	396	

C.—Mundy Harbour, Boothia, Ship "Victory," 1831 September, to 1832 March.

September 1831 -	—	62	12	*128	122	24	* Hail 7 times.
October „ -	—	156	—	67	10	98	
November „ -	—	53	—	80	3	49	
December „ -	—	—	—	27	4	146	
January 1832 -	—	—	—	95	24	193	
February „ -	—	4	—	21	2	174	
March „ -	—	—	—	51	11	109	
Year - - -	—	275	12	469	176	793	

Table XVIII.

Aggregate Hourly Weather Notations in the Gulf of Boothia, 1829 September 1st, to 1832 March 31st.

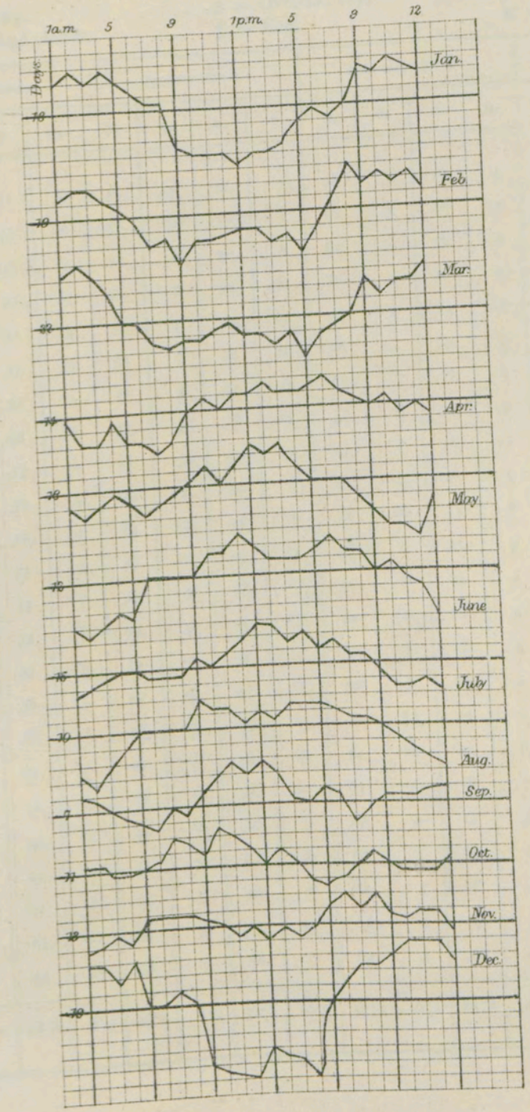
b = Blue sky
c = Detached clouds.
o = Overcast sky.
f = Fog.
r = Rain.
s = Snow.

Hours.	September 1829-31.						October 1829-31.					November 1829-31.				
	b.	c.	o.	f.	r.	s.	b.	c.	o.	f.	s.	b.	c.	o.	f.	s.
1 a.m. -	24	25	41	5	4	17	34	7	52	5	15	35	6	49	2	15
2 „ -	23	29	38	6	4	17	34	11	48	5	15	36	7	47	2	20
3 „ -	21	25	44	7	4	19	32	9	52	7	18	38	9	43	2	18
4 „ -	19	27	44	8	4	23	32	9	52	8	19	37	8	45	2	15
5 „ -	18	30	42	8	4	13	33	7	53	10	19	41	8	41	2	13
6 „ -	17	31	42	8	4	15	34	8	51	11	20	41	7	42	2	14
7 „ -	21	25	44	8	3	17	38	7	48	11	17	41	7	42	2	12
8 „ -	20	31	39	10	4	15	37	5	51	10	19	41	10	39	1	11
9 „ -	24	30	36	9	4	16	35	10	48	5	17	40	10	40	2	15
10 „ -	27	29	34	6	3	14	40	10	43	5	15	39	11	40	2	18
11 „ -	29	28	33	4	3	18	38	11	44	5	13	37	14	39	1	21
12 „ -	27	27	36	7	2	19	36	14	43	5	16	38	11	41	3	21
1 p.m. -	29	25	36	7	2	17	34	13	46	5	14	36	15	39	2	13
2 „ -	26	26	38	8	2	19	36	12	45	6	14	38	14	38	2	11
3 „ -	22	30	38	7	2	17	34	13	46	6	13	37	13	40	2	15
4 „ -	21	30	39	5	—	18	31	13	49	5	12	38	12	40	3	13
5 „ -	24	30	36	6	1	17	29	10	54	7	12	43	10	37	2	10
6 „ -	23	36	31	4	1	15	30	10	53	7	13	45	7	38	1	12
7 „ -	17	34	39	5	2	16	33	7	53	5	17	42	6	42	4	12
8 „ -	19	32	39	5	1	15	35	7	51	5	18	45	4	41	3	13
9 „ -	22	28	40	6	2	17	34	7	52	7	17	41	3	46	2	11
10 „ -	22	26	42	6	3	17	32	11	50	7	15	40	4	46	3	12
11 „ -	22	31	37	9	3	15	32	10	51	6	17	41	5	44	3	14
12 „ -	23	32	35	8	3	16	32	7	54	5	16	41	3	46	3	13
Means -	22·5	29·0	38·5	6·8	2·7	16·8	34·0	9·5	49·5	6·6	15·9	39·6	8·5	41·9	2·2	14·2

Diagram No. 3.

HOURLY FREQUENCY OF BLUE SKY, IN THE GULF OF BOOTHIA

1829 September to 1832 March.



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Dangerfield Lith. 22 Bedford St. Covent Garden

TABLE XVIII. (*continued*).

AGGREGATE HOURLY WEATHER NOTATIONS in the GULF OF BOOTHIA, 1829 September 1st, to 1832 March 31st—*cont.*

b = Blue sky. c = Detached clouds. o = Overcast sky. f = Fog. r = Rain. s = Snow.

Hours.	December 1829–31.				January 1830–2.				February 1830–2.				March 1830–2.			
	b.	c.	o.	s.	b.	c.	o.	s.	b.	c.	o.	s.	b.	c.	o.	s.
1 a.m. -	65	7	21	8	54	11	28	7	61	5	19	4	76	3	14	9
2 „ -	65	5	23	9	56	10	27	7	62	3	20	3	77	2	14	9
3 „ -	62	9	22	12	54	10	29	8	62	4	19	2	76	4	13	9
4 „ -	66	7	20	10	56	7	30	10	61	3	21	2	73	6	14	9
5 „ -	57	4	32	14	54	7	32	11	59	4	22	2	66	3	24	9
6 „ -	57	5	31	13	52	7	34	10	56	4	25	2	66	3	24	9
7 „ -	59	3	31	11	50	9	34	12	51	7	27	2	62	4	27	8
8 „ -	58	3	32	12	50	5	38	13	52	6	27	7	61	2	30	10
9 „ -	46	10	37	8	41	9	43	10	47	8	30	11	62	3	28	11
10 „ -	44	13	36	9	39	10	44	8	52	7	26	9	62	3	28	10
11 „ -	43	14	36	10	39	10	44	10	52	8	25	8	64	6	23	8
12 „ -	42	16	35	9	39	10	44	12	53	9	23	5	65	5	23	7
1 p.m. -	48	12	33	7	37	9	47	12	54	8	23	4	63	6	24	11
2 „ -	47	13	33	6	39	9	45	13	54	9	22	3	63	8	22	12
3 „ -	46	12	35	6	39	10	44	11	51	9	25	4	61	8	24	11
4 „ -	43	12	38	6	40	10	43	11	52	8	25	4	62	9	22	9
5 „ -	57	6	30	8	46	11	36	11	50	12	23	6	58	10	25	13
6 „ -	61	5	27	8	47	10	36	12	54	10	21	8	62	9	22	14
7 „ -	64	7	22	9	46	9	38	11	61	6	18	7	64	5	24	13
8 „ -	64	5	24	7	49	10	34	9	65	3	17	8	65	5	23	12
9 „ -	65	3	25	11	55	6	32	8	62	4	19	5	73	2	18	8
10 „ -	68	3	22	10	54	9	30	8	64	3	18	4	70	7	16	6
11 „ -	68	2	23	10	57	9	27	10	62	4	19	3	72	7	14	6
12 „ -	68	2	23	12	56	9	28	7	64	3	18	4	73	8	12	8
Means -	56·8	7·4	28·8	9·4	47·9	9·0	36·1	10·0	56·7	6·1	22·2	4·9	66·5	5·3	21·2	9·6

TABLE XVIII. (*concluded*).

AGGREGATE HOURLY WEATHER NOTATIONS IN THE GULF OF BOOTHIA, 1829 September 1st, to 1832 March 31st—*concluded*.

b = Blue sky. c = Detached clouds. o = Over-cast sky. f = Fog. r = Rain. s = Snow.

Hours.	April 1830-1.				May 1830-1.				June 1830-1.						July 1830-1.						August 1830-1.					
	b.	c.	o.	s.	b.	c.	o.	s.	b.	c.	o.	f.	r.	s.	b.	c.	o.	f.	r.	s.	b.	c.	o.	f.	r.	s.
1 a.m.	27	5	28	7	34	6	22	7	18	24	18	6	2	6	27	16	19	2	6	1	15	28	19	8	5	2
2 „	24	8	28	9	33	6	23	8	17	22	21	6	1	6	28	17	17	2	7	1	13	31	18	9	8	2
3 „	24	7	29	9	34	5	23	8	19	19	22	6	2	9	29	15	18	3	8	1	15	31	16	8	6	2
4 „	27	5	28	10	35	6	21	7	20	17	23	6	1	7	30	15	17	2	8	1	17	28	17	8	7	3
5 „	24	3	33	14	34	7	21	8	19	17	24	8	1	8	30	12	20	3	8	3	20	24	18	7	6	3
6 „	24	2	34	14	33	8	21	9	24	16	20	6	1	7	29	12	21	3	8	3	20	26	16	8	3	4
7 „	23	3	34	14	34	9	19	8	24	15	21	7	–	7	29	11	22	4	6	2	20	22	20	9	4	5
8 „	24	3	33	14	35	10	17	7	24	12	24	8	1	6	29	14	19	3	6	3	20	24	18	10	6	5
9 „	28	2	30	10	37	8	17	7	24	14	22	6	1	6	31	15	16	5	6	3	24	23	15	6	6	3
10 „	29	3	28	9	38	9	15	7	27	13	20	5	1	5	30	14	18	5	7	1	23	25	14	7	6	2
11 „	28	4	28	8	36	8	18	8	27	14	19	4	–	6	32	12	18	5	7	2	23	23	16	8	8	2
12 „	30	4	26	9	39	10	13	6	29	15	16	3	–	6	33	12	17	3	7	–	21	25	16	10	6	2
1 p.m.	30	4	26	12	41	9	12	4	28	12	20	3	2	8	35	13	14	3	6	–	22	29	11	5	2	1
2 „	31	3	26	12	40	9	13	5	26	12	22	3	3	9	35	11	16	3	6	1	21	28	13	6	5	1
3 „	30	3	27	12	41	8	13	4	26	11	23	3	2	9	33	14	15	3	4	1	23	24	15	6	6	1
4 „	30	3	27	13	38	9	15	5	26	11	23	2	1	10	34	17	11	2	5	–	23	24	15	6	5	–
5 „	31	2	27	10	36	11	15	3	27	10	23	4	3	8	32	16	14	2	7	–	23	25	14	6	6	1
6 „	32	2	26	13	36	8	18	4	29	10	21	4	4	5	33	16	13	2	7	–	22	26	14	7	8	1
7 „	30	3	27	11	36	6	20	4	27	14	19	4	3	6	31	17	14	3	8	–	21	25	16	6	7	1
8 „	29	3	28	11	34	5	23	4	27	15	18	4	4	5	31	14	17	4	6	1	21	23	18	9	7	1
9 „	28	2	30	8	32	5	25	6	24	17	19	3	2	7	29	17	16	3	7	1	20	25	17	10	5	1
10 „	29	4	27	8	30	4	28	6	25	17	18	4	3	6	27	15	20	2	8	1	19	26	17	11	8	1
11 „	27	6	27	10	30	5	27	7	23	15	22	4	3	7	27	12	23	2	7	1	17	27	18	11	8	–
12 „	28	5	27	10	29	6	27	8	22	20	18	3	2	6	28	14	20	2	7	1	16	27	19	10	8	–
Means	27·8	3·7	28·5	10·7	35·2	7·4	19·4	6·2	24·2	15·1	20·7	4·7	1·8	6·9	30·5	14·2	17·3	3·0	6·8	1·2	20·0	25·8	16·2	7·9	6·1	1·8

No. VIII.

Results of Meteorological Observations made in Hudson's Strait by the Officers of H.M.S. "Terror" in 1836-7.

DURING the eventful voyage of H.M.S. "Terror" in 1836, in an attempt to reach Repulse Bay, an elaborate meteorological register was kept in addition to the sea log. In 1838, the captain, afterwards Admiral Sir George Back, published an account of this perilous and arduous voyage, under the title "Narrative of an Expedition in H.M.S. 'Terror,' undertaken with a view to geographical discovery on the Arctic shores, in the years 1836-7." This book will be called the "Narrative" when subsequently mentioned. In the Appendix to it are given, on a single page, the monthly maximum, minimum, and means of the observations taken with the barometers and thermometers; but these results are not satisfactory, because they are not sufficient to define the diurnal range of the pressure and temperature, and the barometrical observations were not corrected for temperature of the attached thermometer; while, under an erroneous impression of the accuracy of the so-called standard thermometer, a large correction appears to have been applied to the observations made with the thermometer used on board for taking the temperature of the air, thereby making the published temperatures considerably too low. The limited information afforded by this table, considered in regard to the extent of the recorded observations, rendered it desirable to discuss these latter more fully. For this purpose the original MS. document was obtained from the Admiralty Record Office. It contains temperature observations made hourly for a considerable portion of the voyage; but as the other data were recorded every two hours, it was not deemed advisable to extend the investigation on account of temperature merely; accordingly the discussion refers to the two-hourly observations only. As nothing was known, with any approach to certainty, respecting the errors of the thermometers used, it seemed a waste of time to devote too much attention to temperature specially. At page 127 of the "Narrative" it is stated: "The temperature had hitherto been registered every two hours, but on October 18th, 1836, two large spirit thermometers, previously tested and found to agree, were placed on each side of a thick post fixed on the taffrail, in a direction due north and south, the southern thermometer having its bulb freely exposed, and the northern one having the brass guard usually thrown over the bulb by the makers. These were now to be registered every

hour, and at 2 p.m., October 20th, with a clear sky and a light air from west, the north showed +4°, and the south +22°. The following day at 6 p.m., wind light at NNE., the temperature fell to 15° by both. An hour after, the weather became overcast, and they rose to 8°."

The southern thermometer being of course exposed to solar radiation, there was no inducement to discuss the observations, and no use has been made of them in the present paper.

At page 157, the "Narrative" states: "November 30th, 1836. The temperature had fallen to −30° of Pastorelli's thermometer, and −38° of Newman's"; and on page 159: "December 3rd, 1836. The temperature now began to decrease rapidly. The difference between Pastorelli's thermometer and mine, made by Newman, (the same which I had with me on my last expedition,) amounted to 8°, the former being −34°, and the latter −42°. I determined to test them by exposing a saucer of mercury to the atmosphere. In the course of an hour it become dull in colour and flattened at its edges, and in two hours and a half more was frozen. In the interval Pastorelli's had fallen to −35°·5, and Newman's to −44°. After this test the one last mentioned was fixed on a post about 70 paces from the ship, and thenceforth registered as the standard thermometer; the others, however, north and south, as well as one contained in a tin case perforated with holes and hoisted to the masthead, being also noted in the log-book."

It appears from the observations that the thermometer by Pastorelli referred to in the above extracts, was the one used for temperature of the air, placed on the taffrail facing north. The temperature of freezing mercury is now known to be −37°·9; and assuming this to have been the true temperature of the air at the time when the thermometers were compared, the correction of Pastorelli's appears to have been about −2°·4 at −35°·5, and that of Newman's +6°·1 at 44°. Assuming further that both instruments were correct at +32°, the freezing-point of water, these corrections may be proportioned along the scales as follows, at least with approximate accuracy:—

Thermometers by	Approximate Corrections.								
	At 32°.	At 22°.	At 12°.	At 2°.	At −8°.	At −18°.	At −28°.	At −38°.	At −48°.
Newman - -	0	+0·8	+1·6	+2·4	+3·2	+4·0	+4·8	+5·6	+6·4
Pastorelli - -	0	−0·3	−0·6	−0·9	−1·3	−1·7	−2·1	−2·5	−2·9

The corrections thus found appear to be supported by the differences of the readings, especially when the circumstances of the positions of the instruments are taken into consideration, Newman's having been placed on the floe, and Pastorelli's on the taffrail. Thus from the readings of these thermometers given in the tables of the extremes,

before being corrected by the above errors, it was found that the reading by Pastorelli's being taken as a standard, when that was—

+12°	Newman's was lower by		2°·0
0	,,	,,	1·7
−15	,,	,,	5·3
−27	,,	,,	9·0
−41	,,	,,	11·0

Again, the mean for January being by Pastorelli's −16°·5, Newman's was 5°·9 lower, and for December the mean by Pastorelli's having been −20°·9, Newman's had been 6°·4 lower. These differences agree sufficiently closely with the differences of the deduced approximate corrections to warrant the applicability of those corrections to the results given from the observations made with the respective instruments, and whatever difference still remains between the simultaneous observations, or their means, may be properly attributed to difference of exposure, those on the floe being naturally somewhat lower than those taken on board the ship. The temperature results obtained on board the ship, and those obtained on the ice, have been corrected for the above approximate errors of the thermometers between 0 and −48°.

There is no information given respecting the barometer, as to whether its frame was made of wood or brass, or as to its accuracy. It is perhaps safe to assume that it had a wooden frame, and that, having been supplied to a scientific expedition, it was tolerably accurate. Under these circumstances the observations and results here given from the barometer have all been corrected for the temperature in the one case, and the mean temperature in the other case, of the attached thermometer, the indications of which were always recorded. Thus, whatever other errors may detract from their perfect reliability, the effect of temperature has been eliminated from the data for the atmospheric pressure, while the possible unknown instrumental errors cannot materially affect the differences which measure the effect of diurnal range. There remains, however, the consideration of the tides, which, perpetually altering the level of the sea, must have a corresponding action on the height of the barometer; but this is a subject which has not hitherto entered into the process of reducing barometrical observations made on shipboard, and probably compensates itself, or nearly so, on a series of observations extending over a month, at least upon the barometrical differences which constitute the diurnal range of pressure.

The force of the wind and the state of the weather were recorded by the Beaufort notations. The directions of the wind have been corrected for errors of the compass until December 22nd, after which date they were entered in the log as *true*.

Table I. contains the results of the observations on atmospheric pressure. From these it appears that the diurnal range of the barometer is scarcely appreciable in Hudson's Strait. The means of the two-hourly observations of the entire year show a single maximum about 8 p.m., and a single minimum about 2 p.m., the extent of the range being only ·01 of an inch. The rise from minimum to maximum is much quicker

than the fall from maximum to minimum. The mean pressure for the year is 29·8 inches. The mean monthly pressure is greatest in March, least in August, September being nearly as low.

Table II. exhibits the results of the observations on the temperature of the air. During the winter, November to March inclusive, the temperature is below zero. The diurnal range is satisfactorily shown, but it is very small in August, November, and December. The minimum temperature occurs about 6 a.m. in February, and about 2 a.m. in July, and the maximum about 2 p.m. The mean daily range was 7° in February, 9°·2 in July; it was greatest in May, 12°·3, least in December, 1°·5. February was the coldest month, with a mean temperature of −25°; July the warmest, 37°·5; so that the mean annual range was 62°·5. The mean temperature of the year was 9°·1.

Table III. brings into comparison the extremes of atmospheric pressure in each month with the accompanying temperature, wind, and weather. The pressure varied from 30·83 in March to 28·20 in December. The greatest monthly range was 2·33 inches in December, the least 0·68 in July. The weather was calmer and clearer with the high than with the low pressures, but not decidedly so, while the temperature does not appear to be much influenced by the extremes of pressure.

Table IV. brings into comparison the extremes of temperature, with the accompanying pressure, wind, and weather, in each month. The temperature varied from −44°·7 the lowest in December, to 59° the highest in June, giving a range of 103°·7. The greatest monthly range was 57°·3 in November, though March was nearly the same, 56°, and January 55°, the least was 18°·3 in August. In July, August, and September, when the Strait is most open, the range of temperature is much less than what it is during the rest of the year, when the Strait is blocked up with ice. The highest temperatures are evidently related to south-westerly winds, clear weather in summer and overcast in winter, and the lowest seem generally to depend on a clear and nearly calm state of the air. Their relation to pressure is not so evident.

Table V. gives the means of the observations taken from the thermometer erected on the floe, corrections having been applied for the before-mentioned approximate errors. These results for December and January agree closer than might have been expected with the means of the temperature observed on the taffrail during the same time. It should be remarked that the thermometer on the taffrail may have been some 10 or 15 feet above the floe. The comparison tends to confirm the trustworthiness of the observations, and to prove that the thermometers were suitably placed to show the temperature of the air.

Table VI. contains results of observations taken from a Six's thermometer exposed at the masthead. The "Narrative" says, under date 1837, April 30th, "The masthead thermometer which throughout the winter had been in a position 87 feet above the sea, now varied so little from those on deck, seldom more than two or three degrees at the most, that it was taken down and the registering of it discontinued." These results compared with those obtained at the same times below, as given in Table II.,

show that the upper air was warmer, except at 2 p.m. in March, and at 8 a.m. and 2 p.m. in April, by the quantities given in the following table:—

Hour.	2 a.m.	8 a.m.	2 p.m.	8 p.m.
December - -	3°·5	3°·1	2°·6	3°·4
January - -	3·9	3·5	2·3	3·8
February - -	2·9	2·5	0·6	2·5
March - -	2·9	1·8	−0·8	2·6
April - -	1·2	−1·4	−1·2	0·8

The differences are greatest at 2 a.m., least at 2 p.m. How far they are to be relied upon must be a matter of conjecture, because there is no certainty as to the accuracy of the thermometer. These results may, however, be of interest in connexion with similar observations made under similar circumstances, and even to point the moral of the necessity of using only properly tested thermometers for scientific observations.*

Table VII. contains the results of the observations on the temperature of the sea-surface. Nothing is known as to the accuracy of the thermometers used for taking the temperature of the sea. Subject to an uncertain amount of error, the series is nevertheless of value as showing the diurnal range of the sea temperature in these summer months. The whole range is only 1° in July, 0°·8 in August, and 1°·1 in September. There is an unexplainable rise between 8 and 10 a.m. in September, due probably to some erroneous readings.

Table VIII. gives the sums of the wind components, obtained by resolving the direction and force at each observation along the cardinal points of the compass. These data are available for the study of the diurnal variation of the wind. One year's results are, however, quite insufficient, and it will probably be found desirable to bring together results obtained at contiguous localities.

Table IX. contains the means of the monthly sums of the wind components as given in the preceding table, together with their resultants. The resultant direction is calculated to the nearest degree, the resultant force is expressed by the Beaufort scale.

* It may be remarked that a thermometer suitable for masthead observations is now available, namely, Negretti and Zambra's recording thermometer, which requires to be inverted when an observation is made. It is necessary to hoist it to the masthead in a suitable protecting shield or case, and then some plan must be adopted for turning it over before lowering it.

Here, also, the insufficiency of one year's observations is evident. Nevertheless, from these results of all the winds there appears a tendency in the wind to veer from NW. by W. at 2 p.m. to NW. by N. at 8 a.m., the force reaching a minimum at 8 p.m., and a maximum at 4 a.m. The mean wind for the year was NW., with a force less than 1 of Beaufort's scale.

Table X. shows the mean of the winds for each month. The resultant wind for October, November, December, and January was W.ly; for February NNW.ly; for March and April N. by E.; the winds of May were exceeding variable; the resultant for June was SSE.; for July NE.ly; for August SW.ly; and for September N.ly.

Table XI. consists of summaries of the winds for each month. It will be seen that the prevalent winds agree generally with the resultants in Table X., being W.ly from October to January; N.ly and NW.ly for the rest of the year, with spells of SE.ly and S.ly. winds in summer. Calms are most frequent in January, and more frequent in the winter generally than in the summer, though June had a large number. As to the frequency of gales, the force 8, and upwards, was recorded in February 10 times, March 14, April 1, May 3, September 7, October 8, November 1, December 24 times; in the other months not at all.

Table XII. contains the summaries of the weather notations of each month. The winter months, November to March, had the most clear weather or blue sky, though July had also many fine days. The total days of blue sky during the year were 116; of overcast 156; the rest, 93, were intermediate or cloudy. February had the least overcast weather. Fog was confined to the summer months, June, July, August, though mists were frequent in winter. Downfalls of snow or rain occurred, taking the order of the months, as follows: 5, 9, 14, 10, 8, 4, 6, 4, 8, 8, 16, 9, making 101 days altogether. Hail was noted once, in July.

No lightning or thunder was noticed. During the voyage of the "Dobbs" and "California" in 1746 through Hudson's Strait, Henry Ellis says: "July 18th. We had a good deal of lightning and thunder, which, however, does not frequently happen here."

A few remarks may here be added, gathered chiefly from Sir G. Back's "Narrative," and it is hoped that they will assist in connexion with the remarks which follow, and which have been condensed from the voluminous entries in the ship's log, in forming an adequate idea of the severe character of the weather, and the formidable nature of the ice in this tidal strait. The temperature observations in the quotations from the "Narrative" have not been altered; they are therefore subject to the corrections stated on p. 90; likewise the barometric and other observations are given as stated in the "Narrative":—

"December 12th, 1836. The wind having increased enough to accomplish the raising of the kite, it was sent up with a self-registering thermometer. This showed a difference of eight degrees greater cold at 1,200 feet perpendicular than on the ice, the

figures being zero and eight degrees *minus*. It may be remarked, also, that the spirit thermometer at the masthead, which had hitherto during the recent weather, when the wind did not extend beyond the surface indicated less cold than those on deck, stood, when the kite was up, at three degrees *plus* [query *minus*] or greater cold than below, agreeing in this respect with Six's."—Page 165.

On April 30th, 1837, it is added: "There were very few occasions which on trial were found favourable for flying a kite with an appended self-registering thermometer, during the former portion of the winter when the floe was unbroken, and that the operation was impracticable in the latter part, when the ice was ground into thousands of peaked and irregular heaps, mounds, and barriers, which defied the activity of the most alert."—Page 328.

1837, December 27th, the "Narrative" states: "As soon as the gale had fairly set in, the barometer began to rise very rapidly, that is to say, with a *southerly wind*, in the same way as it had often previously done with a *northerly one*." The observations taken during the rise and fall of this gale are as follows:—

Day.	Hour.	Barometer.	Attached Thermometer.	Air Temperature.	Wind. Direction.	Wind. Force.	Weather.
27	N.	29·48	44	+ 9	NE. b. E.	3	m s
	2	·48	49	21	E.	1	s
	4	·53	51	+ 1	SE.	6	o s q
	6	·63	51	− 4	"	4	b m
	8	·65	50	3	SE. b. S.	6	b m q
	10	·77	55	5	S.	9	"
	M.	·81	54	8	SSW.	8	b q
28	2	·88	51	9	"	5	b m
	4	·92	51	9	S.	7	"
	6	·98	51	7	"	5	"
	8	30·03	51	− 3	SE.	5	m q
	10	·04	50	+ 2	ESE.	5	b m
	N.	·09	48	+ 5	"	4	"

"On the 31st January 1837 the register at midnight was 54° *minus*. The mercury froze in the artificial horizon, and such as were interested in the experiment fired a

pistol ball of that metal into a piece of wood which had been long exposed to the cold."—Page 206.

"December 21st, 1836. The barometer began to fall with such precipitation as to prepare the minds of all for some uncommon occurrence. The mercury, which had stood at 30 inches, had in the course of eighteen hours, which brought it near the time of change, fallen to 28·26. During this interval the wind had been light and unsteady, veering round the compass, but at 11 a.m., December 22nd, it settled at SSE. and soon blew hard. While these changes were in progress the whole sky had become overcast, and a dense haze, occasioned by the partial falling of snow, limited the view to a very few yards. Hearing a rustling noise, like the rushing of water, apparently beneath us, we supposed that the floe was already separated, and that the consequences would soon be manifested alongside, but very shortly all speculations were merged in the reality before us. Since our departure from England no such storm has been experienced. Within an hour it raged with such fury that not a man could face it. Several who endeavoured to perform some duty outside the ship were instantly frost-bitten, and obliged to return, and the officer of the watch, in merely going from the housing to the taffrail to register the thermometers, had the whole of his face frozen. Not that the temperature was so low as it had been a few days previous, for it was then 53° *minus*, and now only 30° *minus*, but the rapid extraction of heat was beyond endurance, and a very short exposure would have been certainly fatal to the hardiest.

"As night advanced the barometer indicated a change, but the storm still raged like a hurricane, and covered the ship with snowdrift. Our topmasts shook like wands, and the rigging was forced out like a bow, piles of snow were whirled on the lee side of the housing, until the chain which sustained the rough spar that formed the ridge pole broke, and the accumulated weight fell; but the end of the spar fortunately striking the windlass, was stopped in its descent, and thus saved the barge, which otherwise must have been severely, if not irreparably injured. As the wind was directly off shore, there was no great cause for apprehension as to the holding together of the floe, unless indeed the drift should cause sufficient open water to admit of any sea rising, for in that case the result was certain. Though the fury of the tempest gradually abated, it was not entirely exhausted until the 24th. Then the sky was again serene, and a tolerably clear view showed us that instead of having been driven out towards Frozen Strait, we were actually 12 or 14 miles to the eastward of Cape Comfort. This can be accounted for only on the supposition that the flood tide had come from the Welcome, through Fury and Hecla Straits, and, taking the channel of the Frozen Strait, had met the course of the gale nearly at right angles, and thus produced a mean line of direction for the ship between the two, which in fact answered to the position.

"Our floe was slightly cracked within a few yards from either side, but in other respects it looked more extensive and firmer than ever."—Page 169.

"Between February 9th and 11th, 1837, the thermometer on the ice had fallen from 18° *minus* to 37° *minus*, and such was the keenness of the cold occasioned by the wind and drift, that it was at some hazard the officer of the watch could venture even to the registering station, though less than 100 yards from the ship."—Page 214.

"In the latter part of the day of May 12th, 1837, the snow was converted into drizzling rain, the first we had had for more than eight months, and in date corresponding with remarkable precision to the same circumstance in the interior of the Hudson Bay Company's territories. At Fort Franklin, in latitude 65° 11′ 56″ N. and longitude 123° 8′ 52″ W., in 1826, the first shower of rain fell on the 11th of May. At Fort Enterprise in 1820, being in latitude 64° 28′ 24″ N., and longitude 113° 6′ W., and in Fort Reliance in 1834, in latitude 62° 46′ 29″ N., and longitude 109° 0′ 39″ W., rain fell about the same period; and now off Nottingham Island, in latitude 63° 11′ 44″ N., and longitude 78° 56′ 30″ W., it came on the 12th May 1837; so that in this respect 2 degrees of latitude and 44 of longitude occasioned far less difference than might have been expected under circumstances and modifications so various."—Page 337.

The drift of H.M.S. "Terror," while beset in the ice, as calculated by Mr. Saunders, the Master, was as follows:—

Date.	Latitude.	Longitude.	Course.	Distance.
1837. January 1 -	64° 51′ N.	82° 25′ W.	—	—
February 1 -	64 45	82 19	S. 23° 4′ E.	6 miles.
March 1 -	64 16	81 26	S. 38 12 E.	36 "
April 2 -	64 5	80 38	S. 62 15 E.	29 "
May 1 -	63 49	78 55	S. 69 59 E.	46 "
" 30 -	63 14	76 39	S. 60 0 E.	70 "
June 30 -	63 12	74 54	S. 87 35 E.	47 "

1746, July 13th, in Hudson's Strait, "we fell in with abundance of low ice, from 5 to 10 fathoms thick." . . . "It is very easy to discover our approach towards such ice, for the air immediately changes its temperature from warm to cold, besides thick fogs generally accompany it, but these lie low upon the surface, often not so high as the ship's mast's head."

"If I was to give any directions for avoiding the thickest of the ice in these Straits it would be to keep pretty near the north shore, for we always observed that side much the clearest, as not only the winds blow mostly from thence, but currents too come out of most of those large openings which are on that side."—"Voyage of the 'Dobbs and California,' by Henry Ellis."

Table I.

Mean Height of the Barometer, in Hudson's Strait, H.M.S. "Terror," 1836 August, to 1837 July.

Hours.	1836.					1837.							Year.
	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
2 a.m. - -	29·579	29·591	29·789	29·802	29·770	29·925	29·729	29·984	29·943	29·825	29·842	29·848	29·802
4 „ - -	·573	·589	·790	·801	·772	·927	·733	·979	·937	·819	·844	·845	·801
6 „ - -	·575	·589	·791	·797	·767	·926	·738	·980	·939	·821	·849	·841	·801
8 „ - -	·573	·587	·791	·792	·764	·920	·739	·982	·942	·814	·845	·831	·799
10 „ - -	·560	·575	·788	·794	·773	·923	·731	·982	·942	·815	·845	·834	·797
Noon - -	·559	·577	·788	·793	·768	·913	·732	·981	·943	·812	·850	·838	·796
2 p.m. - -	·564	·579	·791	·789	·773	·906	·733	·971	·939	·809	·850	·832	·795
4 „ - -	·570	·583	·788	·797	·789	·910	·741	·977	·946	·811	·847	·830	·799
6 „ - -	·568	·590	·793	·793	·806	·908	·748	·984	·950	·815	·845	·830	·802
8 „ - -	·565	·595	·799	·792	·808	·910	·752	·986	·954	·826	·842	·827	·805
10 „ - -	·573	·597	·795	·787	·807	·904	·749	·985	·948	·831	·842	·831	·804
Midnight -	·565	·597	·794	·781	·803	·899	·744	·980	·936	·832	·843	·832	·801
Means - -	29·569	29·587	29·791	29·793	29·783	29·914	29·739	29·981	29·943	29·819	29·845	29·835	29·800

Table II.

Temperature of the Air, in Hudson's Strait, H.M.S. "Terror," 1836 August, to 1837 July.

Hours.	1836.					1837.							Year.
	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	
	°	°	°	°	°	°	°	°	°	°	°	°	°
2 a.m. - -	+30·8	+25·1	+14·4	−4·4	−22·7	−19·5	−27·1	−14·1	+10·4	+23·1	+29·4	+33·1	+ 6·5
4 „ - -	30·6	25·3	14·6	4·4	22·8	19·5	27·8	14·1	9·9	23·0	29·3	33·7	6·5
6 „ - -	30·6	25·0	15·0	4·6	22·7	19·1	28·0	14·2	10·6	25·1	31·9	35·7	7·1
8 „ - -	31·1	26·2	15·7	4·7	22·7	18·5	27·4	12·1	14·6	29·4	36·8	38·3	8·9
10 „ - -	31·9	27·9	17·5	3·8	22·1	17·3	24·2	8·6	17·5	32·5	40·1	40·5	11·0
Noon - -	32·6	28·9	18·6	2·8	21·9	15·8	21·4	5·0	19·1	34·8	41·1	41·8	12·5
2 p.m. - -	32·9	29·7	18·5	3·3	21·9	16·1	21·0	4·2	19·6	35·3	40·8	42·3	12·7
4 „ - -	32·9	29·1	17·3	4·0	22·5	17·6	22·9	6·5	18·2	34·4	39·5	40·7	11·5
6 „ - -	32·4	27·4	16·6	4·4	23·4	18·1	24·2	9·7	15·5	31·3	36·5	39·3	9·9
8 „ - -	31·6	26·6	16·0	4·2	23·4	18·6	25·1	11·5	12·7	27·1	33·4	36·8	8·5
10 „ - -	31·2	25·8	14·8	5·5	23·4	18·7	25·3	12·2	11·6	25·0	31·1	34·3	7·4
Midnight -	+30·7	+25·2	+13·9	−5·4	−23·0	−19·3	−26·2	−12·2	+10·8	+24·0	+30·0	+33·4	+ 6·8
Means - -	+31·6	+26·9	+16·1	−4·3	−22·7	−18·2	−25·0	−10·4	+14·2	+28·8	+35·0	+37·5	+ 9·1

Table III.

Extremes of Atmospheric Pressure, with accompanying Temperature, Wind, and Weather, in Hudson's Strait, 1836 August, to 1837 July.

Month.	Date.		Max.	Temp.	Wind.	Weather.	Date.		Min.	Temp.	Wind.	Weather.	Range.
	d.	h.	in.	°			d.	h.	in.	°			in.
August 1836 -	26	10	29·89	+29·9	W.b.S. 1	m	10	2	29·01	+32·5	S.b.E. 3	f	·88
September „ -	15	14	30·25	15·5	S.W. 1	b v	20	12	28·96	+28·9	N.W.b.N. 3	o	1·29
October „ -	6	16	·28	+21·7	S.E.b.E. 1	o m	20	16	29·13	− 4·6	N.N.W. 1	b c	1·15
November „ -	6	6	·29	−13·5	Calm	b v	8	16	·30	+16·5	Calm	o	·99
December „ -	31	12	·53	29·1	W.N.W. 1	b c v	21	20	28·20	− 3·1	W.b.S. 5	o m s	2·33
January 1837 -	2	8	·78	19·7	Calm	b c	28	0	29·02	15·6	E.S.E. 3	m s	1·76
February „ -	27	14	·10	28·5	„	b m	14	0	·19	17·1	N.E. 4	o m	·91
March „ -	22	10	·83	7·2	S.S.E. 6	„	15	2	·09	− 9·3	N.W. 5	o m q	1·74
April „ -	11	12	·41	− 1·0	„ 5	o m	26	16	·23	+27·0	W.S.W. 6	o m s	1·18
May „ -	17	6	·23	+28·9	S.E. 1	o c	1	16	·38	9·3	W.N.W 2	o s	·85
June „ -	9	0	·39	40·0	E. 1	b v	20	12	·30	32·0	S. 4	c	1·09
July „ -	9	18	·13	+38·0	W.N.W. 3	„	19	6	·45	+35·0	E.N.E. 6	o r	·68
Year - -	Mar. 1837.		30·83	—	—	—	Dec. 1836.		28·20	—	—	—	2·63

Table IV.

Extremes of Temperature, with accompanying Pressure, Wind, and Weather, in Hudson's Strait, 1836 August to 1837, July.

Month.	Date.		Max.	Bar.	Wind.	Weather.	Date.		Min.	Bar.	Wind.	Weather.	Range.
	d.	h.	°	in.			d.	h.	°	in.			°
August 1836 -	5	2	+40·0	29·60	S.b.E. 3	b c	31	12	+21·7	29·34	N.W.b.N. 1	c	18·3
September „ -	9	2	40·0	·61	Calm	„	15	12	+15·5	30·22	S.W.b.S. 1	b v	24·5
October „ -	10	2	32·0	·78	S.W.b.S. 3	o	22	12	−13·5	29·80	N.W.b.W. 1	b	45·5
November „ -	8	10	24·8	·31	S.S.W. 2	b v	30	6	32·5	·51	S.W.b.S. 2	b c	57·3
December „ -	14	10	1·1	·27	W.b.S. 4	b m	2	8	44·7	·69	„ 1	b m	45·8
January 1837 -	10	2	11·4	·88	S.W. 3	o m	31	10	43·6	·71	Calm	b	55·0
February „ -	3	18	1·1	·70	S.S.W. 7	b c m q	17	14	41·5	·45	S.W. 1	„	42·6
March „ -	29	16	20·7	·88	S.S.E. 2	o s	2	8	35·3	30·12	„ 2	b v	56·0
April „ -	18	0	35·0	·87	N.b.E. 2	o	8	18	−18·7	29·80	W. 1	„	53·7
May „ -	20	2	52·0	30·06	Calm	o m	2	12	+ 2·1	·66	S.E. 5	b c	49·9
June „ -	11	22	59·0	29·87	„	b m	1	14	21·7	·83	S. 1	o s	37·3
July „ -	29	0	+54·0	·99	W.S.W. 1	b v	20	12	+30·0	·83	N.W. 3	b v	24·0
Year - -	June 1837.		+59·0	—	—	—	Dec. 1836.		−44·7	—	—	—	103·7

Table V.

Temperature of the Air by Thermometer on the Floe, in Hudson's Strait, 1836–7.

Hours.	2 a.m.	4.	6.	8.	10.	N.	2 p.m.	4.	6.	8.	10.	M.	Mean.
Dec. 1836	−22°·5	−22°·9	−22°·7	−22°·3	−21°·6	−21°·7	−21°·6	−22°·5	−23°·0	−23°·7	−23°·6	−23°·2	−22°·6
Jan. 1837	−19·4	−19·3	−19·3	−18·4	−17·1	−14·9	−15·6	−17·9	−18·1	−18·3	−18·6	−19·4	−18·0
Mean -	−21·0	−21·1	−21·0	−20·4	−19·4	−18·3	−18·6	−20·2	−20·6	−21·0	−21·1	−21·3	−20·3
On Ship -	−21·1	−21·2	−20·9	−20·6	−19·7	−18·9	−19·0	−20·1	−20·8	−21·0	−21·1	−21·2	−20·5

The extreme temperature registered from the thermometer on the Floe were—
On December 14d. 10h., max. 2°·6; 3d. 8h., min. −46°·2; range 48°·8.
January 10d. 0h., max. 13·4; 31d. 12h., min. −47·1; range 57·5.

Table VI.

Mean Temperature by the Masthead Thermometer, 87 Feet above the Sea, in Hudson's Strait, 1836–7.

—	2 a.m.	8.	2 p.m.	8.	Max.	Date.	Min.	Date.	Range.
						d. h.		d. h.	
December 1836 -	−19°·2	−19°·6	−19°·3	−20°·0	−1°·0	10 8	−37°·0	2 20	+36°·0
January 1837 -	15·6	15·0	13·8	14·8	4·0	4 20	36·0	30 20	40·0
February „ -	24·2	24·9	20·4	22·6	2·0	3 14	38·0	22 14	40·0
March „ -	−11·2	−10·3	−5·0	−8·9	−21·0	29 14	32·0	2 8	53·0
April „ -	+11·6	+13·2	+18·4	+13·5	+35·0	18 0	−16·0	10 14	+51·0

Table VII.

Mean Temperature of the Sea, in Hudson's Strait, 1836 August and September, 1837 July.

Hours.	2 a.m.	4.	6.	8.	10.	N.	2 p.m.	4.	6.	8.	10.	M.	Mean.
July 1837	+32°·1	+32°·1	+32°·3	+32°·3	+32°·3	+32°·5	+32°·6	+32°·9	+32°·4	+32°·3	+31°·9	+31°·9	+32°·3
Aug. 1836	30·4	30·4	30·3	30·6	30·7	30·9	31·0	31·1	30·8	30·9	30·7	30·5	30·7
Sept. „	+28·1	+28·0	+27·8	+27·8	+28·8	+28·9	+28·9	+28·9	+28·5	+28·6	+28·4	+28·3	+28·4

The extreme temperatures registered were—
On July - 31d. 4h., max. 39°·0; 20d. 12h., min. 29°·5; range 9°·5.
August - 5d. 2h., max. 36·0; 25d. 0h., min. 25·0; range 11·0.
September 1d. 0h., max. 31·5; 0d. 18h., min. 23·0; range 8·5.

Table VIII.

Sums of Wind Components, Hudson's Strait, H.M.S. "Terror," 1836 August, to 1837 July.

Hours.	August, 1836.				September, 1836.				October, 1836.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
2 a.m. -	19·7	36·1	19·0	34·8	60·9	18·5	36·7	31·6	21·9	28·6	6·9	35·8
4 „ -	23·4	26·5	22·6	33·7	62·9	23·0	28·7	32·3	24·8	24·6	10·0	34·9
6 „ -	23·8	26·4	21·2	37·6	58·4	19·5	23·1	32·3	25·7	22·0	12·9	31·5
8 „ -	24·7	26·2	24·8	35·1	51·3	16·3	28·4	27·6	28·9	20·4	10·4	30·5
10 „ -	21·5	34·5	23·7	40·6	51·7	20·7	28·2	25·3	34·5	20·2	7·7	28·7
Noon -	22·8	34·0	19·8	47·0	58·7	19·6	27·0	26·7	30·7	23·5	9·0	34·0
2 p.m. -	21·1	33·3	22·5	39·4	55·6	20·5	33·2	23·6	30·7	23·8	9·3	42·4
4 „ -	23·6	35·0	19·4	36·5	51·5	22·1	37·0	27·6	31·5	18·0	9·1	31·5
6 „ -	16·9	39·8	17·3	30·3	49·6	22·3	34·1	35·6	26·6	29·4	8·0	28·8
8 „ -	13·7	43·2	16·5	26·4	45·3	20·3	36·4	32·6	28·1	23·3	8·6	28·1
10 „ -	21·8	40·0	13·6	30·1	43·5	21·8	39·8	33·7	26·3	26·4	6·4	32·3
Midnight -	22·7	37·4	12·0	34·4	46·5	19·9	36·0	32·7	23·7	27·4	8·0	33·0
Means	21·3	34·4	19·4	35·5	53·0	20·4	32·4	30·1	29·3	24·0	8·9	32·6

(*continued*).

Hours.	November, 1836.				December, 1836.				January, 1837.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
2 a.m. -	20–4	18·1	16·9	51·6	22·7	25·4	12·6	40·8	20·1	11·4	2·5	28·7
4 „ -	23·3	16·8	18·3	44·1	23·1	21·9	14·0	47·0	15·0	12·1	8·5	27·1
6 „ -	18·3	23·1	24·4	42·1	19·7	25·1	14·2	45·2	15·2	18·0	12·8	31·0
8 „ -	17·1	21·1	20·1	29·6	28·4	30·0	12·3	33·3	15·4	18·3	10·7	22·7
10 „ -	18·0	26·8	24·8	37·2	25·7	36·7	11·8	40·7	23·3	17·9	12·9	28·3
Noon -	19·2	34·5	22·8	39·9	20·9	38·0	10·9	41·8	20·1	18·3	15·7	24·7
2 p.m. -	16·7	24·1	25·6	41·1	25·0	39·8	8·5	51·1	18·5	16·4	13·5	36·3
4 „ -	15·8	24·9	22·5	39·4	25·6	33·6	20·6	49·1	13·8	14·1	10·7	29·6
6 „ -	22·1	27·8	13·0	38·0	12·7	28·1	19·0	28·0	16·3	17·1	5·8	26·5
8 „ -	14·7	28·2	15·7	31·3	23·9	41·1	18·6	30·2	13·0	19·4	5·1	26·8
10 „ -	18·6	20·3	22·8	39·3	29·8	30·8	15·1	31·3	12·6	20·1	4·5	22·4
Midnight -	20·0	18·3	24·8	43·2	21·7	27·6	14·6	30·0	15·6	18·1	6·7	29·4
Means -	18·7	23·7	21·0	39·7	23·3	31·5	14·4	39·0	16·6	16·8	9·1	27·8

TABLE VIII. (*continued*).

SUMS OF WIND COMPONENTS, HUDSON'S STRAIT, H.M.S. "TERROR," 1836 August, to 1837 July.

Hours.	1837.											
	February.				March.				April.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
2 a.m. -	37·4	14·8	18·3	20·7	65·1	28·7	25·1	19·0	65·3	21·1	26·1	18·4
4 „	41·9	12·8	13·6	26·3	60·9	31·5	21·0	20·1	61·1	19·6	27·3	25·0
6 „ -	46·9	15·5	12·8	22·3	54·1	29·4	28·3	20·6	55·7	21·0	27·8	26·8
8 „ -	41·8	18·3	12·8	27·7	51·7	29·9	29·9	21·5	52·8	18·1	34·2	23·6
10 „ -	42·9	17·6	12·9	24·8	50·3	28·0	29·8	19·2	52·2	24·0	32·3	29·5
Noon -	48·1	17·2	13·0	33·5	52·8	23·2	27·9	20·2	49·6	26·1	28·1	27·6
2 p.m. -	46·1	23·2	8·1	33·0	56·9	23·8	23·0	17·3	44·9	24·9	28·3	22·8
4 „ -	53·2	15·9	6·9	37·4	55·0	25·1	31·4	20·4	43·4	24·1	30·5	25·3
6 „ -	48·7	15·2	9·2	30·9	57·3	21·6	28·3	24·4	49·5	17·0	28·6	21·2
8 „ -	39·6	12·7	9·0	26·7	55·8	28·0	34·3	24·7	46·8	18·2	24·8	19·3
10 „ -	45·5	10·8	12·0	27·2	52·0	29·6	24·6	23·4	57·1	23·0	30·1	20·9
Midnight -	42·6	14·4	10·8	24·0	61·6	29·9	21·6	26·4	57·2	15·7	35·1	21·2
Means -	44·6	15·7	11·6	27·8	56·1	27·4	27·1	21·4	53·0	21·1	29·4	23·5

(*continued.*)

Hours.	1837.											
	May.				June.				July.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
2 a.m. -	36·4	23·0	34·3	30·6	3·9	42·8	28·3	22·7	33·8	18·1	31·3	21·8
4 „ -	27·5	19·8	30·9	30·9	5·7	43·9	33·8	26·3	37·1	18·2	30·3	19·6
6 „ -	33·0	21·3	33·8	31·5	6·3	50·8	32·5	26·9	37·3	17·4	29·0	17·0
8 „ -	21·3	16·2	27·5	30·0	6·3	49·4	35·8	20·2	32·7	16·9	27·2	16·0
0 „ -	24·8	23·5	30·9	27·9	7·7	45·3	33·0	21·7	38·4	16·9	28·0	17·8
Noon -	26·8	32·6	26·7	23·2	8·1	36·7	32·9	20·4	30·6	14·3	31·9	15·0
2 p.m. -	25·2	40·7	26·7	23·1	6·1	40·9	41·1	17·9	36·8	16·1	37·8	16·7
4 „ -	24·8	40·0	27·0	27·0	6·4	36·2	44·2	17·2	33·5	14·3	36·2	19·8
6 „ -	28·3	34·7	22·0	27·8	6·0	28·1	42·6	18·0	26·9	17·4	41·0	17·3
8 „ -	23·9	27·5	26·7	27·7	1·0	24·4	38·6	21·4	29·4	15·4	35·6	21·1
10 „ -	23·6	33·2	26·7	30·2	6·1	20·2	38·3	21·5	33·8	15·3	37·2	25·3
Midnight -	29·9	27·2	32·4	27·0	5·1	23·4	35·2	21·7	32·4	13·9	38·2	24·2
Means -	27·1	28·3	28·8	28·1	5·7	36·8	36·4	21·3	33·6	16·2	33·6	19·3

TABLE IX.

MEANS OF THE MONTHLY SUMS OF WIND COMPONENTS, WITH THEIR RESULTANTS, HUDSON'S STRAIT, H.M.S. "TERROR," 1836 August, to 1837 July.

Hours.	Components.				Resultant.	
	N.	S.	E.	W.	Direction.	Force.
2 a.m. - -	34·0	23·9	21·5	29·7	N. 39° W.	1·08
4 „ - -	33·9	22·6	21·6	30·6	N. 39 W.	1·21
6 „ - -	32·9	24·1	22·4	30·4	N. 42 W.	0·99
8 „ -	30·2	23·4	22·8	26·5	N. 29 W.	0·65
10 „ -	32·0	26·0	23·0	28·4	N. 39 W.	0·71
Noon - -	32·4	26·5	22·2	29·5	N. 51 W.	0·78
2 p.m. - -	32·0	27·3	23·1	30·4	N. 57 W.	0·73
4 „ - -	31·5	25·3	24·6	30·1	N. 42 W.	0·70
6 „ - -	30·1	24·9	22·4	27·2	N. 43 W.	0·60
8 „ - -	27·9	25·1	22·5	26·4	N. 55 W.	0·40
10 „ - -	30·9	24·3	22·6	28·1	N. 40 W.	0·72
Midnight -	31·6	22·8	23·0	28·9	N. 34 W.	0·88
Mean - -	31·7	24·7	22·7	28·8	N. 41 W.	0·78

TABLE X.

MONTHLY RESULTANTS OF THE WIND, HUDSON'S STRAIT, H.M.S. "TERROR," 1836 August, to 1837 July.

Month.	Resultant.	
	Direction.	Force.
August - - -	S. 51° W.	0·7
September - - -	N. 4 E.	1·1
October - - -	N. 78 W.	0·8
November - - -	S. 75 W.	0·6
December - - -	S. 72 W.	0·9
January - - -	W.	0·6
February - - -	N. 29 W.	1·2
March - - -	N. 12 E.	0·9
April - - -	N. 11 E.	1·1
May - - -	S. 30 E.	0·1
June - - -	S. 26 E.	1·2
July - - -	N. 39 E.	0·7

Table XI.

Summary of Winds, referred to Sixteen Points, with Mean Force (Scale 0 to 12), Hudson's Strait, 1836 August, to 1837 July.

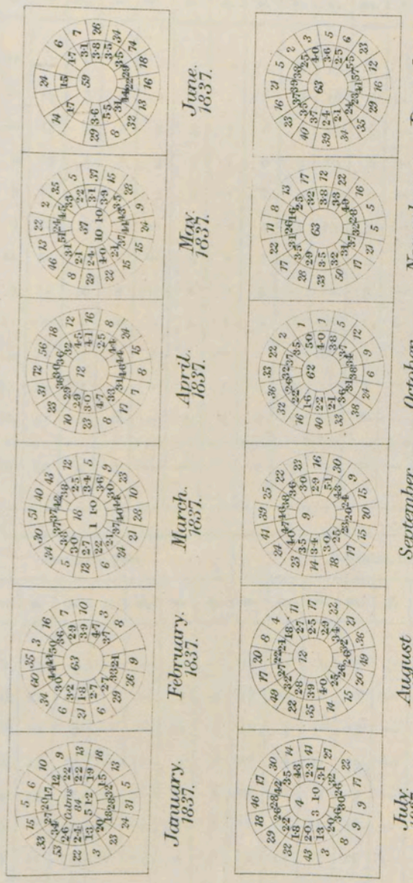
Months.	Total Observations.	N.		N.N.E.		N.E.		E.N.E.		E.		E.S.E.		S.E.		S.S.E.	
		O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.
1836.																	
August	372	20	2·2	8	2·1	4	1·8	11	2·7	17	2·5	22	2·9	21	3·4	36	3·2
September	360	39	4·6	25	3·8	22	3·6	23	3·0	16	2·9	30	5·1	9	4·3	15	2·4
October	372	33	3·2	22	3·7	2	3·5	1	5·0	1	4·0	5	3·8	12	3·7	9	3·4
November	360	11	2·6	8	1·6	13	2·5	17	3·2	12	3·8	22	3·3	16	4·9	5	2·8
December	372	21	3·9	5	3·8	2	2·5	3	4·0	5	3·6	6	2·5	23	5·5	12	5·7
January	372	5	2·0	6	1·7	10	1·2	9	2·2	13	2·2	18	1·9	13	1·5	5	3·2
1837.																	
February	336	35	4·1	3	5·0	16	3·6	7	2·9	10	3·9	3	4·7	8	3·7	—	—
March	372	51	3·7	40	4·2	43	3·8	12	2·5	5	3·4	9	3·6	23	3·0	10	4·4
April	360	72	3·0	56	3·6	18	3·2	12	4·5	16	4·1	8	2·5	24	4·4	15	4·4
May	372	22	2·4	2	4·5	35	3·3	5	2·2	37	3·1	15	3·9	28	3·5	9	4·3
June	360	24	1·5	—	—	6	1·7	7	3·1	26	3·8	34	3·5	74	3·5	18	2·9
July	372	46	2·8	17	4·2	30	3·5	14	4·3	41	2·3	27	3·1	22	3·2	17	2·6

(*continued.*)

Months.	S.		S.S.W.		S.W.		W.S.W.		W.		W.N.W.		N.W.		N.N.W.		Variable.		No. of Calms.
	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	
1836.																			
August	49	2·6	20	2·6	15	2·5	14	4·0	35	3·9	22	2·8	49	3·2	17	2·7	—	—	12
September	20	2·0	15	2·3	17	2·5	18	3·0	14	3·4	23	3·5	24	4·0	41	4·7	—	—	9
October	6	3·8	24	3·1	38	3·6	33	2·1	40	2·2	16	1·6	32	2·2	36	2·6	—	—	62
November	5	3·2	21	3·7	17	3·1	50	3·2	33	3·5	28	2·9	17	3·5	22	3·1	—	—	63
December	16	4·1	29	2·3	35	2·4	34	2·1	39	2·4	40	3·7	23	3·5	16	3·7	—	—	63
1837.																			
January	31	2·8	24	1·8	23	2·0	3	1·3	22	2·4	53	2·6	33	3·4	15	2·7	5	1·2	84
February	9	2·1	26	3·3	29	2·7	6	2·7	21	1·8	6	3·2	34	3·0	60	4·4	—	—	63
March	28	4·0	21	3·7	24	2·1	6	2·2	12	2·7	5	3·0	34	3·8	30	3·7	1	1·0	18
April	8	4·6	7	3·1	17	3·3	8	4·7	23	3·0	10	2·9	23	2·9	31	3·8	—	—	12
May	24	4·4	15	3·7	15	2·1	22	4·0	29	2·4	8	2·1	46	3·1	13	5·1	10	1·0	37
June	16	2·2	13	4·4	32	3·1	8	5·5	29	3·6	—	—	14	1·7	—	—	—	—	59
July	9	3·0	9	3·6	8	2·0	3	1·3	43	2·0	32	1·8	29	2·2	18	2·6	3	1·0	4

Diagram No. 4.

WINDS IN HUDSON'S STRAIT.



Wind-roses, formed from Table XI. The outer annulus contains the number of observations for direction, the inner annulus the mean force; the upper portion of the central area the number of calms, the lower portion the number of variables with their mean force.

(*To face page 104.*)

Dangerfield, Lith. 22 Bedford St. Covent Garden.

Table XII.

Summary of Weather Notations, Hudson's Strait, H.M.S. "Terror," 1836 August, to 1837 July.

Hours.	1836. August.								September.								October.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
2 a.m.	4	10	17	6	4	2	4	1	4	7	19	13	1	1	2	5	4	6	21	7	—	1	5	6
4 „	6	10	15	3	5	2	2	1	6	6	18	6	—	1	8	4	6	6	19	10	1	—	7	5
6 „	6	10	15	5	2	5	4	1	6	6	18	5	—	—	11	3	5	7	19	10	—	—	7	5
8 „	7	9	15	3	2	3	5	1	6	5	19	6	—	—	8	3	5	8	18	11	—	—	9	1
10 „	9	9	13	3	3	3	5	—	6	7	17	5	—	—	5	2	6	8	17	8	—	—	9	2
Noon -	9	9	13	5	3	—	3	—	5	12	13	3	—	—	5	2	5	8	18	8	—	—	10	4
2 p.m.	9	11	11	3	4	—	3	1	4	12	14	3	—	—	5	1	3	9	19	4	—	—	10	2
4 „	11	9	11	4	4	—	4	1	3	11	16	5	—	—	7	1	2	10	19	7	—	—	4	2
6 „	10	11	10	6	2	1	3	1	3	8	19	6	—	—	7	1	2	8	21	4	—	—	3	4
8 „	6	9	16	3	3	2	6	—	2	9	19	7	2	—	6	2	2	8	21	10	—	—	3	4
10 „	6	11	14	5	4	1	5	1	3	10	17	6	1	2	6	1	3	7	21	9	—	—	6	5
Midnt.	4	10	17	4	6	—	3	3	4	9	17	6	1	1	3	4	4	7	20	9	—	—	4	5
Mean -	7	10	14	4	4	—	—	—	4	9	17	6	—	—	—	—	4	8	19	8	—	—	—	—

(*continued.*)

Hours.	November, 1836.								December, 1836.								January, 1837.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
2 a.m.	14	7	9	9	—	—	8	—	11	11	9	18	—	—	4	2	13	11	7	11	—	—	4	—
4 „	13	6	11	12	—	—	7	1	13	10	8	18	—	—	3	2	11	12	8	12	—	—	4	—
6 „	12	6	12	9	—	—	6	1	12	9	10	17	—	—	3	2	11	12	8	16	—	—	2	1
8 „	12	4	14	13	—	—	3	1	11	9	11	19	—	—	3	3	9	11	11	16	—	—	4	1
10 „	13	4	13	12	—	—	3	2	12	12	7	17	—	—	2	3	10	13	8	15	—	—	4	1
Noon -	12	6	12	9	—	—	3	2	11	10	10	18	—	—	4	1	12	9	10	11	—	—	6	1
2 p.m.	14	5	11	12	—	—	4	1	10	10	11	19	—	—	3	—	11	11	9	14	—	—	4	1
4 „	13	6	11	12	—	—	3	2	9	11	11	19	—	—	4	—	11	10	10	11	—	—	4	1
6 „	12	6	12	13	—	—	2	2	10	11	10	18	—	—	3	1	12	11	8	16	—	—	4	—
8 „	13	4	13	8	—	—	2	2	10	12	9	21	—	—	2	1	14	9	8	12	—	—	3	1
10 „	15	3	12	9	—	—	3	3	12	12	7	17	—	—	3	1	13	11	7	15	—	—	2	1
Midnt.	13	1	16	10	—	—	5	3	12	11	8	16	—	—	3	—	12	11	8	15	—	—	3	—
Mean -	13	5	12	11	—	—	—	—	11	11	9	18	—	—	—	—	12	11	8	14	—	—	—	—

Table XII. (*continued*).

Summary of Weather Notations, Hudson's Strait, H.M.S. "Terror," 1836 August, to 1837 July.

Hours.	1837. February.								March.								April.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
2 a.m.	16	9	3	19	—	—	1	3	16	7	8	16	—	—	3	7	9	3	18	4	—	—	2	2
4 „	17	8	3	17	—	—	1	2	15	9	7	15	—	—	3	7	9	3	18	5	—	—	6	1
6 „	16	9	3	16	—	—	1	4	12	11	8	21	—	—	5	5	11	2	17	7	—	—	8	2
8 „	17	8	3	17	—	—	1	1	12	8	11	19	—	—	6	5	11	4	15	7	—	—	3	3
10 „	17	9	2	19	—	—	—	2	13	7	11	19	—	—	6	3	11	5	14	3	—	—	3	2
Noon -	17	7	4	17	—	—	—	2	12	7	12	17	—	—	5	1	10	5	15	5	—	—	2	1
2 p.m.	17	9	2	14	—	—	—	—	14	4	13	12	—	—	6	2	9	7	14	7	—	—	2	—
4 „	16	9	3	14	—	—	2	1	15	5	11	11	—	—	8	3	9	8	13	6	—	—	2	—
6 „	17	7	4	12	—	—	2	2	16	6	9	12	—	—	4	2	8	9	13	7	—	—	2	—
8 „	17	8	3	12	—	—	4	2	16	9	6	16	—	—	4	6	8	8	14	3	—	—	2	—
10 „	17	8	3	15	—	—	2	1	15	8	8	17	—	—	4	6	9	7	14	5	—	—	2	—
Midnt.	17	8	3	14	—	—	3	2	16	7	8	17	—	—	1	4	8	6	16	4	—	—	2	1
Means	17	8	3	15	—	—	—	—	14	7	10	16	—	—	—	—	9	6	15	5	—	—	—	—

(*continued.*)

Hours.	1837. May.								June.								July.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
2 a.m.	3	2	26	5	—	3	10	1	3	4	23	3	2	3	4	4	15	7	9	3	1	4	—	3
4 „	3	2	26	4	—	3	13	—	4	5	21	5	1	2	6	4	17	6	8	3	1	4	—	3
6 „	3	4	24	5	—	2	13	—	3	5	22	5	3	3	6	3	17	6	8	5	2	4	—	3
8 „	6	5	20	6	—	1	9	—	5	7	18	5	3	3	4	1	14	6	11	6	3	4	—	—
10 „	6	5	20	7	—	1	10	—	6	11	13	5	2	2	2	2	15	6	10	6	3	4	—	—
Noon -	8	7	16	7	—	1	7	—	5	8	17	6	2	1	5	4	14	5	12	7	2	4	—	—
2 p.m.	7	10	14	3	1	2	6	2	6	5	19	6	1	—	5	4	15	8	8	4	1	1	—	1
4 „	8	9	14	2	1	2	5	1	7	6	17	6	1	1	4	4	15	8	8	5	1	2	—	1
6 „	6	8	17	2	—	1	6	1	6	6	18	6	2	—	3	3	16	7	8	4	2	2	—	—
8 „	6	8	17	1	—	1	7	1	5	5	20	6	1	2	5	2	15	6	10	3	2	4	—	—
10 „	3	7	21	2	—	1	9	2	5	5	20	5	2	2	5	2	15	6	10	2	2	5	—	—
Midnt.	2	3	26	5	—	4	7	3	4	5	21	5	2	3	1	2	15	7	9	2	1	4	—	—
Means	5	6	20	4	—	—	—	—	5	6	19	5	2	—	—	—	15	6	10	4	2	—	—	—

Remarks on the State of the Sea, &c.

1836.

Date.	Lat. N.	Long. W.	Remarks.
July.			
30. N. -	60° 22′	62° 40′	Stream and sailing ice.
Aug.			
1. N. -	60 44	63 33	Current E. 14′. Boring through a pack of ice.
„ 9 -	—	—	Passed through a strong tide ripple.
2. N. -	61 18	65 25	Heavy sailing and stream ice. Solid pack 20 to 25 feet high. Very heavy floes. Several seals, a flock of king ducks, large flocks of looms.
3. 2 -	—	—	Several whirlpools and strong ripples where the ship became perfectly unmanageable.
„ N. -	61 40	67 6	Current S. 15′ and E. 5′ in two days. A good deal of sailing ice.
4. N. -	62 3	67 54	Current E. 7′. Observed a berg split and capsize.
5. N. -	62 30	69 36	Passed a great quantity of tangle weed. Loose ice.
6. N. -	62 39	70 50	Heavy packed ice.
7. 4 -	—	—	Working through a lead of water about 6 miles broad.
„ N. -	62 55	71 11	Sailing ice.
8. N. -	63 24	72 19	A good deal of loose ice.
„ 10 -	—	—	Fast to a berg; no bottom with 153 fathoms; ice streaming past at about 1′ an hour.
9. 2 -	—	—	The berg was set in motion by a heavy floe striking it.
„ N. -	63 28	72 47	Several dovekies and a goose seen.
„ 4 -	—	—	Cast off from the berg. Loose ice.
10. N. -	63 42	73 14	Heavy ice; very large floes.
8 -	—	—	Fast to a floe; current N.W. by N. 1′ per hour (? mag.)
M. -	—	—	Current E. ½ N. 1′ per hour.
11. 9 -	—	—	Several seals. Ice very closely packed ahead.
„ N. -	63 33	73 30	Sounded in 129 fathoms, gray sand; at 150 fathoms the boat was set to E.S.E. (? mag.) at the rate of 2′, and when hauled up to 65 fathoms it was set to Nd. (? mag.) at ½ mile.
12. N. -	63 25	73 43	Shifted to a larger floe.
13. 8 -	—	—	Warping between several large floes and pieces of ice.
„ N. -	63 26	73 50	Heavy ice, occasional floes.
14. N. -	64 10	75 53	Heavy sailing ice; streams of ice.
15. N. -	64 5	77 15	Straggling pieces of ice.
„ M. -	—	—	Aurora in the N.W. (? mag.)
16. N. -	64 22	77 31	A race between the ship and the land, ship 1 mile from the land.
„ 7 -	—	—	Passed through a strong ripple.
„ M. -	—	—	A stream of very heavy sailing ice.
17. N. -	64 42	80 5	A very large floe. Two whales. Sailing ice. Found the compass sluggish with head to W.
18. N. -	64 57	80 37	Sailing ice. Several narwhals.
„ 8 -	—	—	Fast to a floe.
19. 2 -	—	—	Loose ice setting to S. by E. about ½ mile per hour.
„ 4 -	—	—	In a lane of water.
„ N. -	64 58	80 40	Sailing ice. At 6, fast to a floe.
„ M. -	—	—	Ice apparently stationary round the ship.
20. N. -	65 0	80 44	At 10, cast off. In a lane of water. At 4, fast to a floe.
21. 2 -	—	—	Water covered with bay ice. Heavy ice still thickly packed.
„ 8 -	—	—	The sailing ice going rapidly, passed the ship in all directions.
„ N. -	65 3	80 36	Warping to north. Two whales.
„ 10 -	—	—	Fast to a floe. Several narwhals.
„ M. -	—	—	Ice apparently stationary. At 2, cast off.

Remarks on the State of the Sea, &c.—*continued.*

1836—*cont.*

Date.	Lat. N.	Long. W.	Remarks.
Aug.	° ′	° ′	
22. N. -	65 25	81 8	Warping and boring through the ice. Large floes.
23. N. -	65 40	82 15	Boring through heavy ice.
24. N. -	65 48	82 1	Fast to a floe.
25. 4 -	—	—	Boring through the ice.
„ N. -	65 47	81 59	Fast to a floe. At 4, boring through heavy pack ice.
„ 8 -	—	—	Fast to a floe.
„ M. -	—	—	Ice perfectly still. At 6, ice opened a little; warped along the edge of the floe, and at 8, made fast.
26. N. -	65 45	82 0	At 6, ice slackening round the ship.
27. N. -	65 45	81 54	Ice close. At 8, four white whales in a small pool. At 12, ice very thickly packed.
28. N. -	65 45	81 54	Ice thickly packed round the ship.
29. 6 -	—	—	A gull flying about the ship.
„ N. -	65 48	81 55	At 4, ice setting to E.S.E. At 6, ice drifting fast to E. by N.
30. 6 -	—	—	Ice drifting fast to E.S.E.
„ N. -	65 41	81 35	At 2, cast off from the floe. Heavy loose ice.
31. 4 -	—	—	Ice closely packed.
„ N. -	65 41	81 35	Some land birds about the ship. Ice close.
Sept.			
1. N. -	65 41	81 37	Ship closely beset. A burgomaster seen.
2. 6 -	—	—	Ice opened a little. Warping and boring all day.
„ N. -	65 37	81 40	Ice getting smaller. Compasses very sluggish.
„ M. -	—	—	Ice closely packed.
3. N. -	65 25	81 50	Boring through heavy ice. Several white whales.
„ M. -	—	—	Ice closely packed round the ship.
4. N. -	65 12	81 35	At 4 p.m., ice opening very fast inshore. At 10, ice close.
5. N. -	65 5	81 39	At 4 p.m., boring through the ice. At 10, in a large pool of open water. At 12, a good deal of loose ice.
6. N. -	65 0	81 58	Fast to a floe. At 8 p.m., found the ship setting N.W.
7. N. -	—	—	Ice close; found the ship drifting S.W.
8. N. -	65 8	82 25	Ice close; ship drifting E. by N. At 4 p.m., ice opening a little. At 12, ice close packed.
9. 2 -	—	—	Aurora S. by W.
„ N. -	65 4	82 8	At 2, fast to a floe drifting E. by N. At 12, ice close.
10. N. -	65 5	82 5	At 2, thermometer in the Sun 52°, in shade 38°.
„ 10 -	—	—	Faint aurora to S. by E., shooting to zenith.
11. N. -	65 3	82 3	Ice close; a bear near the ship. At 8, ice slacking.
12. N. -	65 5	82 10	At 4 a.m., cast off from the floe, and at noon made fast again. At 6, ice opening a good deal, cast off from the floe, but at 2 a.m., made fast to a small floe.
13. 4 -	—	—	Ice all in motion, setting to N. by W.
„ N. -	65 7	82 20	Ice closing round the ship.
14. N. -	65 3	82 17	At 6 a.m., ice moving in all directions; at 8, close packed round the ship.
15. N. -	—	—	Ice closely packed. At 8, aurora S.W. by S. At 12, aurora shooting from over the land towards the zenith, till 3 a.m.
16. N. -	65 3	82 23	At 4 p.m., ice slacked a little. Boring in the ice till unable to make way at midnight.
18. N. -	65 12	82 43	Ice closely packed round the ship. At 8, ice running to N.W.
„ M. -	—	—	Aurora shooting from S. by E. to zenith.
19. N. -	65 14	82 47	Ice close. Shot a white fox.

Remarks on the State of the Sea, &c.—*continued.*

1836—*cont.*

Date.	Lat. N.	Long. W.	Remarks.
Sept.	° ′	° ′	
20. N. -	65 14	—	At 10, beams and timbers cracking very much; the floe broke up and rose to the height of 18 or 20 feet. At 6, ship straining very much and leaking. At 12, pressure not so great.
22. N. -	65 16	83 8	Beset with ice. At 6, ice slacking a little.
23. N. -	65 16	83 8	Ice close; slacking a little with the tidal action.
24. -	—	—	Beset with ice. At midnight, pressure very great on the ship.
25. -	—	—	Beset with ice.
26. N. -	65 18	83 3	Ice all in motion. At 10, a good deal of pressure on the ship.
27. N. -	—	—	Ship very heavily pressed.
28. -	—	—	Tracks of a fox seen round the ship.
29. -	—	—	Ice close and stationary.
30. -	—	—	Shot a white fox; and afterwards saw another fox.
Oct.			
1. N. -	—	—	Ship beset in the ice. Saw a raven.
3. -	—	—	Shot a white fox.
4. 11 -	—	—	Thermometer in sun 37°, in shade 26°.
5. N. -	65 15	83 37	At 10 p.m., aurora southward, shooting towards the zenith.
6. -	—	—	At 2 a.m., aurora very bright to westward.
8. -	—	—	Temperature of the sea 28°.
9. -	—	—	1 to 4 a.m., aurora to S.Wd. A snow bunting seen.
13. -	—	—	At 3 a.m., aurora showing from N. to zenith. Midnight, ice in motion, and hitting heavily against the ship.
14. -	—	—	At 6 a.m., ice close.
17. -	—	—	Cape Comfort, S. 67° E. 11′. At 8 p.m., the aurora bright from W. to S.E.
23. 2 -	—	—	Parhelia round the Sun.
24. -	—	—	At 4 p.m., noticed a lane of water inshore. At 8, ice opening in various places.
25. -	—	—	At 4 a.m., upper clouds stationary, lower from S.W. At 4 p.m., several lanes of water in sight.
26. -	—	—	A great deal of water inshore; the ice round the ship close, but moving in azimuth.
27. N. -	—	—	Ice round the ship setting bodily to N.Ed. At 4, stationary.
28. -	—	—	Open water inshore.
29. -	—	—	Ice drifting towards Southampton Island.
30. -	—	—	At 2 a.m., ice brought up against the land; ship about a mile off shore. At 4.30, two prismatic haloes round the Moon.
„ N. -	65 15	83 44	Distant about 3′ from the land, and drifting fast towards Cape Comfort.
Nov.			
1. N. -	—	—	Frozen in, off Smyth Harbour.
4. -	—	—	A fox close to the ship. At 7 p.m., aurora very bright in E.S.E., shooting to the zenith. At 10, bright to Ed.
5. -	—	—	At 9 p.m., aurora shooting from N.W. to S.E.
7. N. -	65 13	83 32	At 1 a.m.. aurora shooting in horizontal lines to the S.Ed. At 6 p.m., faint aurora in the E.N.E. shooting to the zenith. At 7.30, the wind shifted suddenly from N.N.W. 3 to S.E. 5.
9. N. -	—	—	Shot a white fox. Ship drifting in the floe to N.E. At 10, aurora shooting in curved lines to Ed.
10. 8 -	—	—	Set very much to N.Ed.
„ N. -	Cape Comfort S.W. 5′.		
„ 2 -	—	—	Drifting fast to S.W. At 6, ice close.

Remarks on the State of the Sea, &c.—*continued.*

1836—*cont.*

Date.	Lat. N.	Long. W.	Remarks.
Nov.	° ′	° ′	
11. -	—	—	A great quantity of open water inshore.
12. -	—	—	Shot a white fox.
13. -	—	—	At 8.40 p.m., aurora very brilliant in the E., shooting from a semi-arch in direct lines to the zenith.
14. N. -	—	—	The bay ice rose 15 or 18 feet at several places, from the pressure caused by the whole body of ice setting to Wd. at the rate of 1′ per hour. At 11, aurora shooting from the E. to the zenith.
16. 9. -	—	—	Open water extending from S. to N.
„ 9 -	—	—	Aurora from S.W. to zenith.
18. N. -	65 9	83 9	Var. 50° 13′ W. on the ice.
20. 8 -	—	—	Ship set during the night to the S.Wd., and close inshore.
„ N. -	—	—	Setting slowly to the S.Wd.
„ 4 -	—	—	Floe stationary.
„ 8 -	—	—	Setting slowly to N.Ed.
„ 10 -	—	—	Ship setting towards the land.
21. 4 -	—	—	Setting towards the land very much.
„ N. -	65 10	83 9	Setting to S.Wd. At 4, stationary.
„ 9 -	—	—	Setting fast to S.Wd.
22. N. -	65 15	83 20	Unable to see the land, the snowdrift and mist being so thick.
23. 5 -	Cape Comfort S. 5′.		
„ N. -	—	—	Ship drifting to S.Wd. By making a hole in the pack found the thickness of the ice to be 2½ feet.
„ 8 -	—	—	Ship drifting slowly towards the shore.
24. 6 -	—	—	Ship set during the night to the S.Wd.; same noted at 10 and 4. At 8, stationary.
26. 2 -	—	—	Ship setting slowly to S.Wd.
„ N. -	Cape Comfort, S. 60° E., 12′.		Ship setting slowly to S.Wd. A small lane of water inshore extending from S.S.E. to S.W.
„ 8 -	—	—	Ship setting to N.Ed. Same noted Midnight and 4 a.m.
27. N. -	65 12	83 10	Var. 61° 48′ W. on the ice. At 8, setting slowly to N.Ed.
29. M. -	—	—	Drifting to N.Ed.
30. N. -	65 11	83 40	Var. 67° 12′ W., on the ice.
Dec.			
1. N. -	—	—	Frozen in off Cape Comfort.
„ 7 -	—	—	Aurora to S.Ed. At 10, extending from N.E. to S. At 2 a.m., very faint from S.W. to N.W.
3 -	—	—	At 2 a.m., aurora faintly in E. From 4 to 6, ice to N.W., making a great noise as if in motion. At 4 p.m., ice making a great noise inshore.
7. N. -	65 12	83 40	Var. 58° 40′ W., on the ice.
8. -	—	—	At 1 a.m., aurora very faint to S.Ed. At 5, very bright. At 8 p.m., aurora forming an arch from S.E. to E.
9. N. -	—	—	A good deal of open water to S.Wd. At 7 p.m., aurora to S. At 9.15, very bright from E.N.E. to W.S.W.
10. N. -	—	—	A lane of water towards the N.W. part of the floe. The ship has set a little to S.Wd. during the last four hours.
12. -	—	—	At 3 p.m., sent a thermometer up by a kite to an elevation of 1,200 feet perpendicular; before starting it read 0°, and aloft registered —8°·5. At 8, aurora faintly to Nd.; Midnight extending from N.W. to S.E. very bright; 1 a.m., very bright, shooting towards the zenith in various shapes in every direction.
13. -	—	—	Reindeer brought on board. At 8 p.m., aurora moving horizontally from S.W. to N.E.

Remarks on the State of the Sea, &c.—*continued.*

1836—*concluded.*

Date.	Lat. N.	Long. W.	Remarks.
Dec.	° ′	° ′	
14. -	—	—	Three wolves seen on shore.
20. -	—	—	At 2 p.m., a lane of water open to the N.E. by N. At 6, aurora very faint, from N.W. by W. to the zenith.
21. -	—	—	At 3 a.m., the ice making a great noise to seaward.
22. -	—	—	The compasses being of no use in showing the direction of the wind or bearing of the land, &c., the captain has this day ordered that the true bearing, &c. be put in the log until further orders.
23. -	—	—	Snowdrift level with the gunwale in several places.
24. N. -	Cape Comfort, S.S.E., about 3 leagues.		
25. N. -	Cape Comfort, S., 4 to 5 leagues.		
29. -	—	—	At 8 p.m., aurora very brilliant. At 9, very bright to N.Wd.
30. -	—	—	At 2 a.m., aurora shooting in horizontal lines from N. to S. At 4 p.m., aurora faint in N.W.; at 7, shooting in horizontal lines to the zenith.
31. -	—	—	At 10 p.m., aurora to S. and E.

1837.

Jan.			
1. -			At 11 p.m., aurora very brilliant; at 2 a.m., faint to Ed. Ice cracking and making a great noise.
2. N. -	Cape Comfort, W. 35′		Sounded in 114 fathoms, green sand. Ice opening into lanes of water to within 300 yards of the ship. Midnight, aurora faint in the N.E.
3. -	—	—	At 10 p.m., aurora faint in the S.E.; at 11, very brilliant from E.N.E. to W. by S. Ice making a great noise to Ed.
4. N. -	64 51	82 25	The floe has been set inshore and to Wd. At 6 p.m., aurora faint in S.E.; at 8, flitting in detached arches from S.E. to N.W.
5. N. -	64 51	82 25	At 9 p.m., ice making a great noise in the direction of the land.
6. N. -	—	—	Lane of water in front of ship still open.
7. -	—	—	Have considerably neared the land during the night. A small bird flew round the ship. Ice making a great noise, pressing on the floe, and breaking it.
8. -	—	—	At 7 p.m. diffused aurora; at 9, rather faint, but extending in an arch from E.N.E. to S.S.W.
9. -	—	—	At daylight found the ship had drifted within 3 miles of the land. Sounded in 70 fathoms, rocky green bottom. Ship setting to Wd. A lane of water formed inshore. At 11 p.m., aurora very faint in N.E.
10. N. -	—	—	Ship has set N.W. ¾ mile since noon yesterday. Snowdrift very thick. Sounded in 95 fathoms, rocky bottom with sand. Temp. at surface 28, at bottom 29. Ship set a good deal to Wd. during the afternoon.
11. -	—	—	Ship set to Ed. during night and forenoon. Sounded in 107 fathoms, rocky bottom.
12. -	64 44	—	Sounded in 78 fathoms, mud, coarse sand and rocks. Several holes of water to seaward.
13. -	—	—	Aurora very bright to Sd. Ice making a noise.
„ N. -	64 44	82 24	Sounded in 78 fathoms, rocky bottom. At 8 p.m. faintly diffused aurora.
14. -	—	—	At 2.35 p.m., a very beautiful meteor of a pale emerald colour, direction from N. to S.
15. N. -	64 44	82 24	Two parhelia, the eastern 21° 57′ and the western 22° 10′ distant from the Sun's centre. The sky was rather overcast, and their appearance but faintly defined. Orange and red were the prevailing colours. At 5, aurora to E.N.E.

Remarks on the State of the Sea, &c.—*continued.*

1837—*cont.*

Date.	Lat. N.	Long. W.	Remarks.
Jan.	° ′	° ′	
16. -	—	—	At 4 a.m.. aurora faint to S.E.; at 6, very bright from E. to W. through the zenith.
19. N. -	64 44	82 24	Ice cracking to N.E. At 1.30, a parhelion to the east of the Sun; distance of arch from Sun's centre 22°; orange and red the prevailing colours. At 10.45, a prismatic halo round the Moon; exterior diameter 9°, interior 5°.
20. -	—	—	At 8 a.m., ice making a noise to seaward. At 3, a lane of water opened some miles to seaward, extending from N. to E.S.E.
22. N. -	64 44	82 24	Ice cracking and squeezing upon the ship. At 3.30, a parhelion 22° 20′ W. of the Sun.
23. N. -	64 44	82 24	Ice making a great noise to Nd. At 2, a parhelion 22° W. of the Sun. At 12, ice cracking and squeezing past our floe.
24. -	—	—	Ice making a great noise to N.Ed.
25. N. -	64 44	82 24	Ice still on the move to the Nd.
26. -	—	—	At 2 a.m., faint aurora in E. At 6, a large halo round the Moon. Several holes of water opening and closing by the tide in shore.
27. -	—	—	Ship has been set Ed. during the night. Sounded in 156 fathoms, green mud. At 9 p.m., aurora faint to Sd. At 11, shooting from arches at an elevation of 70° towards the zenith.
28. -	—	—	Found a considerable under-current, but, from the depth of the ice, unable to ascertain its direction. Sounded in 156 fathoms, green mud. At 6 p.m., aurora faint to S. and E.; at 10 in N.N.E.
30. -	—	—	Ship drifted during the night to the Wd. A lane of water open in-shore.
31. -	64 46	82 19	Ice making a loud noise from S.E. to W. At 8 p.m., faint aurora shooting from N.W. to zenith. At 9, in a brilliant arch from E. to N.W.
Feb.			
1. N. -	64 45	82 19	Distant 3′ from shore. Ice making a noise. A lane of water in-shore.
2. -	—	—	At 2 a.m., faint aurora over the land.
„ N. -	64 45	82 20	Ice in motion and making a great noise. Two parhelia E. and W. of the Sun 25°.
3. N. -	—	—	A lane of water extending from S.E. to W.S.W. near the land. Ship drifting off shore, and very fast to Ed. At 11, aurora faint to Sd. A great deal of snowdrift.
4. N. -	—	—	A large lane of water extending from S.S.E. to W. Snowdrift very thick.
5. N. -	64 50	—	Ship drifting to Ed.
6. N. -	64 39	82 1	Sounded in 150 fathoms, green mud. Ship setting to Wd., then to Ed. At 8 p.m., aurora shooting from E. to the zenith.
7 6 -	—	—	Faint aurora to Sd. Ship during the night drifted considerably to Ed.
„ N. -	64 32	81 49	Five miles off shore. Sounded in 150 fathoms, green mud. Ice making a great noise. At 10, aurora visible to Nd.
8. -	—	—	At 7 p.m., aurora flitting in detached rays from the zenith. Ice making a great noise.
9. N. -	64 29	81 46	Ship drifting fast to E. Sounded in 152 fathoms, dark green mud. Ship drifting fast to N.N.W., afterwards to W. A piece of ice about 20 feet in depth detached itself from the west floe and a lane of water opened in the bay ice on the edge of the floe, in which several seals were seen.
10. N. -	64 26	—	The ship has set considerably to the Ed. and off shore. The lane of water has extended from the western to the southern edge of the floe. A few seals seen in the opening, and two ravens flying Nd. Much snowdrift.

Remarks on the State of the Sea, &c.—*continued.*

1837—*cont.*

Date.	Lat. N.	Long. W.	Remarks.
Feb.	° ′	° ′	
11. N. -	64 21	81 43	Sounded in 103 fathoms, green mud; and rocky with mud.
12. 2 -	—	—	Aurora very bright in N.W.
„ N. -	64 19	81 39	Sounded in 106 fathoms, rocky with mud.
13. 2 -	—	—	Aurora very bright from N.E. to zenith,. Ice making a great noise.
„ N. -	64 16	—	Sounded in 119 fathoms, mud and small stones; no under current.
14. N. -	—	—	Sounded in 130 fathoms, mud and coarse sand. At 9.30, halo round the Moon of 48° diameter. Much snowdrift.
15. 2 -	—	—	A large bright halo round the Moon. Snow drift thick.
„ N. -	64 21	—	Sounded in 95 fathoms, rocky with mud. A rupture took place in the floe. At 3, a parhelion 23° E. of the Sun.
16. N. -	64 19	81 40	Sounded in 86 fathoms, green mud.
17. N. -	—	—	Sounded in 87 fathoms, green mud. Ice making a loud noise.
18. N. -	64 19	81 40	Great break up of the ice. About 80 yards from the ship a barrier of ice rose to the height of 30 feet, from S.W. to N.E. At 5, the ice made suddenly a rushing noise and a lane of water appeared.
19. 8 -	—	—	A parhelion. Shot a dovekie. Great changes in the ice.
„ N. -	64 17	81 30	Sounded in 82 fathoms, mud, and small pieces of limestone.
„ M. -	—	—	The water under the ice making a loud rushing noise.
20. 2 -	—	—	Ice slacking all round. At 4, ice in motion. At 8, ice still.
„ N. -	64 16	—	Sounded in 88 fathoms, black sand. From 1 to 4, the ice in motion, at times moving in different directions as if influenced by various causes.
21. 6 -	—	—	Ship rose about 18 inches, her sides cracking very much.
„ N. -	64 15	—	Ship rose forward 2 feet 9 inches. Ice drifting to Wd.
„ 6 -	—	—	Ice setting against the ship with great pressure. A very loud rushing noise of the ice outside of the floe.
22. 6 -	—	—	A large piece of ice was raised by the pressure 17 feet. Ship heavily nipped. Sounded in 72 fathoms, yellow sand and rock.
„ N. -	64 15	81 29	Ship drifting to N.W.
23. N. -	64 15	81 28	Ice setting rapidly to N.W.
24. N. -	64 15	—	At 4, ship setting fast to Wd., and till 10 the ice was incessantly in motion.
25. N. -	64 14	81 27	7 to 8 a.m., ship setting to S.E. 7.30 to 8 p.m., ice coming in rushes from N.W., pressing heavily on the stern.
26. N. -	64 12	81 19	10 to 11 a.m., the ice came at intervals in heavy rushes. Sounded in 72 fathoms, rock and sand. At 11, aurora shooting in direct lines from an arch in the S.W. to the zenith.
27. -	—	—	Ship during the night set a good deal to S.E. Lanes of water in various directions. 8 to 11, ship setting fast to S.E. At 1.40, ship began to move towards N.W. At 6, ice setting bodily to N.W.
28. 2	—	—	Aurora shooting from an arch in S.E., in direct lines to the zenith. The outshore ice began to set to N.W.
„ 7 -	—	—	The ice began to set to S.E.
„ N. -	64 13	81 20	Sounded in 65 fathoms, mud. At 1.30, a thermometer hung against the black part of the ship's side, exposed to the Sun, rose to +11°·5, in the shade −21°. Snow on ship's side melting at 3.
„ M. -	—	—	Aurora very faint in N.W.
March.			
1. N. -	64 15	81 26	Main body of ice setting slowly N.W. Two circles round the Sun, the outer 45°, with parhelia, three in the inner and one in the outer circle.
„ M. -	—	—	Ice closed with great pressure astern and on the quarters.
2. 2 -	—	—	Ice in motion with a loud rushing noise.

Remarks on the State of the Sea, &c.—*continued.*

1837—*cont.*

Date.	Lat. N.	Long. W.	Remarks.
March	° ′	° ′	
2 6 -	—	—	The land much raised by refraction.
„ N. -	64 14	81 25	A thermometer placed against a black surface rose in the Sun to 28°, shade −22°. Main body of ice setting slowly to S.E.
3. 8 -	—	—	Ice drifting to N.W.
„ N. -	64 14	81 18	A great deal of frost smoke in the atmosphere. At 1, a thermometer placed against a black surface rose in the Sun to 24°·4, shade −9°.
„ 4 -	—	—	Ship set since noon to Ed.
4. 3 -	—	—	Faint aurora.
„ 8 -	—	—	Ice setting to N.W. since daylight. At 10, thermometer in Sun 39°, in
„ N. -	64 15	81 19	shade −12°. At 2 p.m. 33°, and −9°
„ 6 -	—	—	Ship setting to Ed.
5. 2 -	—	—	Aurora faint to S.W. Ship set a good deal to S.E.
„ N. -	64 14	—	At 1, ice commenced setting to S.E.
„ 8 -	—	—	Ship forced up 15 feet by the commotion of the ice, and continually hammered by huge calves from below.
6. 2 -	—	—	Ship righted. At 9.30, the outside ice began to set to Wd.
„ N. -	64 13	81 17	Sounded in 62 fathoms, sand and stones.
„ 5 -	—	—	Ice setting fast to S.E. since 2 p.m.
„ 11 -	—	—	Aurora very brilliant in zenith.
7. 8 -	—	—	Ice set to S.E. since 4 a.m.
„ N. -	64 13	81 16	The last four hours the ice drifted in a body to N.W. At 2.35 till 5.50, ice set to S.E. Then the ice closed with great pressure abaft, causing the ship to lift 3 inches. At 7.40, the pressure was tremendous; a part of the bulkhead fell out in the after cockpit. In the forenoon blackened bulb thermometer on black surface, exposed to Sun 44°, shade −10°; afternoon, 40° and −14°.
8. 4 -	—	—	Ice making a tremendous grinding noise inshore.
„ 7 -	—	—	The pressure caused the ship to rise several inches. Ice coming at intervals with heavy rushes from N.W. At 9.45, ice stopped, and at 10.30, commenced setting to N.W. till 2.30. At 3.40, ship began to set to S.E.
„ N. -	64 12	81 12	Thermometer on black surface exposed to Sun 35°, shade −10°; at 1 41° and −8. A large flight of birds left the land going Nd.
9. 8 -	—	—	Sounded in 73 fathoms, rock and sand. Two ravens near the ship. Setting Ed. till 10.30, then slowly to N.W.
„ N. -	64 11	—	At 8, the ice came at intervals in heavy rushes with tremendous pressure against the ship, raising her bodily several inches.
10. -	—	—	At 1.40, a meteor shot from N.W. with a very brilliant pale blue colour. At 7, vane from masthead blown away.
„ 11 -	—	—	The set having been S.E., now began slowly Wd. and N.W. till 4; soon after again S.E.
11. 2 -	—	—	Aurora faint to Nd.
„ 6 -	—	—	Ice setting fast to S.E.; noon, began to set NW.
„ N. -	64 10	81 10	Blackened bulb thermometer exposed to Sun, 46°, shade −16°; and at 1 p.m., 43° and −15°. From 4 to 8 setting slowly S.E.
„ 10 -	—	—	Ship heavily nipped and wedged up.
12. N. -	64 9	81 6	From 6 to 10.40, set S.E. and E.; 12.15 to 4.30, N.W. and W.
13. -	—	—	Set E. and S.E., then N.W. and W.
14. -	—	—	A great deal of snowdrift. Set to E. then to W. At 7.30, a halo round the moon.
15. 6 -	—	—	Ship during the night has been set very much to S.E.
„ N. -	64 3	—	Ice pressing heavily. At 2, tremendous pressure on ship. At 4, ship thrown up by the stern 7 feet 8 inches.

Remarks on the State of the Sea, &c.—*continued.*

1837—*cont.*

Date.	Lat. N.	Long. W.	Remarks.
March	° ′	° ′	
15. 8 -	—	—	A solid wave came on with an immense wall of ice.
16. 2 -	—	—	Two awfully tremendous rushes came on the port quarter, careening the ship over three or four streaks, followed by another which threw up a barrier 30 feet high within 10 yards of the ship.
„ N. -	64 4	—	Setting to Ed.
17. N. -	64 3	80 36	4 to 8 a.m., setting Wd.
18. -	—	—	Set Wd. in forenoon, Ed. in afternoon.
19. 4 -	—	—	Frost smoke rising from cracks in the ice.
„ N. -	64 3	80 39	Set Wd. in forenoon; 1.30 to 6, Ed.
20. 4 -	—	—	Ice passing to Ed. along the land floe; 7.30 to 11.30, to Wd.; in the
„ N. -	64 4	80 38	afternoon, to Ed.
21. 8 -	—	—	Setting to W.
„ N. -	—	—	Two prismatic circles and four parhelia round the Sun.
22. 6 -	—	—	A great deal of frost smoke inshore.
„ N. -	64 6	80 28	At 9, setting slowly Wd.; at 3.30, slowly Ed.
23. N. -	64 10	80 34	A blackened bulb thermometer on a black surface exposed to Sun's rays 39°, shade 10°. A prismatic circle round the Sun. At 1 p.m., 35° and 11°. A little set to W., then to E.
24. -	—	—	At 12.30 a.m., paraselenæ and a prismatic circle. At 6, ship setting E. At 10, ice began to set slowly to W.
„ N. -	64 6	—	Blackened bulb thermometer 11°, shade 2°; at 1, 14° and 2°. At 3.45, ship began to set Ed.
„ 10 -	—	—	Aurora very faint in N.E.
25. -	—	—	4.30 to 10, setting to Ed.; 10.30 to 3, setting to Wd. Sounded in 64 fms., dark coloured stones and gravel. 4.15, ice began to set Ed.
26. 6 -	—	—	Drifting fast to Ed.; 10.30 to 4, setting Wd. Sounded in 94 fms., green mud. 5 to 8, setting Ed.
27. -	—	—	5 to 10.30, ice setting Ed.; 11 to 3.40, setting Wd. Sounded in 120 fms., yellow mud. A raven flying near the ship. 5.45, ice began setting Ed.
28. 5 -	—	—	Ship began to set Ed.
„ N. -	64 7	80 28	Sounded in 183 fms., brown mud. Two ravens flying near the ship. 5.30, ship stopped setting Ed.
29. -	—	—	9 to 11.45, setting Ed. Sounded in 60 fms., rocky.
„ N. -	64 5	—	2 to 4.30, setting Wd.
30. 5 -	—	—	Sounded in 65 fms., mud. 8.30 to 2.30, setting slowly Ed., then Wd. slowly.
31. -	—	—	A seal seen. Sounded in 56 fms., hard bottom.
April.			
1. -	—	—	5 to 1, ship setting slowly Wd. Sounded in 95 fms., green mud.
„ 10 -	—	—	Aurora to N.W. very faint. 4 to 5, setting Ed.; 5.30, to Wd.
2. N. -	64 4	80 37	6 to 11.30 setting Wd. Sounded in 73 fms., mud and small stones. Afternoon, setting Ed.; 6.15, began to set Wd.
3. -	—	—	6.30, stopped setting Ed.; 7.30 to 11.40, set Wd.; 1, setting Ed.; 7.30, began to set Wd. Sounded in 62 fms., mud and small stones.
4. -	2½′ off shore.	—	4 to 7.30, setting Ed.; 8.15 to 12.15, Wd. Sounded in 54 fms. mud. 1 to 7.40, setting Ed.
5. -	—	—	4 to 8, setting Ed.; 8.30 to 1.30, Wd. Sounded in 130 fms., mud. 1.45 to 8, setting Ed.
6. -	—	—	4.30, setting Ed.; 8.15 to 2, Wd. Sounded in 27 fms., rock and sand. 2.30 to 8, setting Ed. and continuing. A narwhal seen.
„ 9 -	—	—	Sounded in 30 fms., rock and shells.

Remarks on the State of the Sea, &c.—*continued.*

1837—*cont.*

Date.	Lat. N.	Long. W.	Remarks.
	° ′	° ′	
April			
7. 4 -	—	—	Sounded in 22 fms., rocky.
„ 9 -	—	—	Stopped setting Ed. Sounded in 45 fms., mud. At 10.30, a parhelion. Sounded in 34 fms., rock. 10 to 1.50, setting Wd.; 3 to 10, Ed. continuing. Sounded at intervals, 27 fms., green mud and shells; 48 fms., mud; 54 fms., coarse sand; 54 fms., mud.
8. N. -	63 52	79 55	Two seals seen. Sounded in 63 fms., sand; 74 fms., green mud; 67 fms., mud and rocks; 58 fms., rocky; 63 fms., green mud. 5 to 10, setting Ed.; 10.15 to 2.45, Wd.; 3.30 to 8, Ed., and still fast.
„ 10 -	—	—	A barrier 18 ft. high formed on the floe.
9. -	—	—	Setting Wd. till 4; 5 to 10, Ed.; 11 to 4, Wd.; 4.30, began Ed.
„ N. -	63 50	79 56	Soundings 50 fms., soft mud; 55 fms., rocks.
10. -	—	—	4.50 to 11, setting Ed.; 9.30, great pressure on the floe, forming a barrier and breaking off pieces. 12.30, began Wd.; 4.50 to 8 Ed., still fast.
„ N. -	63 55	80 15	9, great pressure on the floe, barrier 20 ft. high formed, which disappeared at 12.30.
11. N. -	63 49	80 14	4.50, stopped setting Wd.; 5.50 to 11.30, Ed.; 12.45, began Wd.; 6, Ed. Soundings 48 fms., green mud and shells; 50 fms., green mud.
12. N. -	63 52	80 11	8.15, setting slowly Ed.; 1, Wd.; 5.30 Ed., times of commencing.
13. N. -	64 5	80 22	Set Wd. a good deal in night; 5, setting Ed. till 1.30; 2.15, began Wd.; 6, stationary.
14. N. -	64 6	80 14	5.20, setting slowly Wd.
16. N. -	64 2	—	1.30, setting slowly Ed.
18. 6 a.m.	—	—	Setting Ed.
19. 10 -	—	—	Setting Wd.; 1, slowly Ed. till 8; 8.30, began Wd.
20. N. -	63 55	80 8	During night till 8 a.m., set considerably Ed.; noon, setting Wd.; 1.30 to 8, Ed. continuing. A large flock of birds (apparently ducks) flying Nd.
21. N. -	63 53	80 8	Drifting Wd.; at 5, Ed. fast; noon, S.E.; 4, Wd.; 6 to 8, Ed. A flock of about 40 ducks seen.
22. N. -	63 52	79 49	4, setting S.Ed., and 3 and 8 the same. 7, parhelion.
23. -	—	—	8, setting Ed.; 9.30 to 3, N.W.; 3.20 to 6, S.E. Sounded in 115 fms., green mud. Saw a large flock of ducks. Shot a young bear; stomach perfectly empty.
24. N. -	63 51	—	Set very much Nd. during night.
25. N. -	63 49	—	A small bird flying round the ship.
26. N. -	63 57	80 15	A snow-bunting flying about the ship. A flight of ducks.
27. -	—	—	
28. N. -	63 58	79 4	
29. N. -	63 53	79 0	A large flock of ducks flying to N.W.
30. N. -	63 54	78 50	
May.			
1. N. -	63 49	78 54	Ship beset and drifting with the ice during the whole month.
2. N. -	63 39	—	Five large flights of ducks going Nd.
3. N. -	63 44	78 53	Saw a gull flying Wd.
4. N. -	63 41	—	A raven flying near the ship. A number of birds in the lanes of water. A white whale.
5. N. -	63 38	78 58	
6. N. -	63 36	78 58	
7. N. -	63 28	79 9	Three burgomasters. Two flocks of looms flying to Nd. Ship setting fast to S.E.
8. N. -	63 19	79 7	Several large flocks of birds flying Wd. Ship set several miles Sd.
9. -	—	—	No water in sight.

Remarks on the State of the Sea, &c.—*continued.*

1837—*cont.*

Date.	Lat. N.	Long. W.	Remarks.
	° ′	° ′	
May			
10. N. -	63 12	79 0	Nearly forty large flights of looms flying Wd. Several lanes and holes of water.
11. -	—	—	A raven near the ship. A large flight of ducks passing Nd.
12. -	—	—	
13. N. -	63 12	—	A raven near the ship.
15. -	—	—	Set a good deal to Sd. and S.E. Great numbers of looms, ducks, and teal passing Nd.
16. N. -	63 4	78 36	Vast numbers of birds.
17. N. -	62 58	78 8	Set to Ed.
18. N. -	63 0	78 4	Set N.W., then E. Large flocks of looms flying to S., the ice slack in that direction.
19. N. -	63 0	78 3	A snow bunting seen.
20. N. -	62 58	—	A raven, and a seal seen.
21. -	—	—	A raven flying about the ship.
22. -	—	—	Setting Ed.
23. N. -	62 59	78 22	Setting Ed. Several flocks of birds flying past.
24. N. -	63 4	77 47	
26. N. -	63 1	77 19	Several flocks of birds flying Nd. Two very large birds going Nd.
27. -	—	—	Several flocks of birds flying S.E.; p.m., ice setting slowly to N.Ed.
28. N. -	63 7	—	Setting NEd.
29. N. -	63 10	77 2	Setting N.Ed.
30. N. -	63 14	76 39	Saw an ivory gull. At 6 p.m. a lane of water 10 yards wide opened about 30 yards off, extending about a mile N.W.
31. -	—	—	
June.			
1. -	—	—	Ship beset and drifting with the ice. Set to N.Ed. Several flocks of looms; two or three seals; a walrus.
2. N. -	63 16	—	9 p.m., loose ice, drifting fast to N.E.
3. N. -	63 15	—	A large seal. Ice slack; at 2 p.m. ice passing to N.E. along the edge of the pack.
4. N. -	63 13	76 13	7.30 a.m., slack ice setting S.W.
5. N. -	63 14	—	Several small birds flying about the ship. A flock of sandpipers, a flock of small brown birds, and a flock of snowbuntings seen. A flock of ducks passed.
6. -	—		
7. N. -	63 13	76 13	A white whale seen in the lane of water.
8. N. -	63 11	—	Several birds flying over the water. Found that the ice had melted from the ship's side 2ft. 5in. since May 15th.
9. N. -	62 57	75 20	Several flocks of looms flew past the ship.
10. N. -	63 1	75 32	
11. N. -	63 6	75 38	
12. N. -	63 4	75 42	Four swans passing Nd.
13. -	—	—	
14. N. -	63 2	75 31	Sounded in 46 fms., rock and shells.
15. N. -	63 0	75 30	A large flock of geese flew past the ship. At 10, a thermometer with its bulb blackened placed in the Sun, rose to 66° shade 41°.
16. N. -	62 57	75 40	
17. N. -	62 58	74 50	Sounded in 85 fathoms. Saw a walrus.
18. N. -	62 51	—	A great deal of open water in sight.
19. -	—	—	Ice conjectured to be 40 or 50 feet thick in some parts of the floe in which the ship is still embedded.
21. -	—		
22. N. -	62 54	74 40	A great deal of open water in sight.
23. -	—	—	

REMARKS ON THE STATE OF THE SEA, &c.—*concluded.*

1837—*concluded.*

Date.	Lat. N.	Long. W.	REMARKS.
May	° ′	° ′	
24. N. -	62 48	73 59	For some days the sets have been E. and W. with the tides. Sounded in 74 fms., mud.
25. N. -	—	—	Sounded in 115 fms., mud and shells; at 4.30, 86 fms., mud.
26. -	—	—	At 8, 80 fms., mud; at noon, 113 fms., rock; at 4.30, 112 fms., sand.
27. 7 -	—	—	No bottom at 180 fms.; several narwhals.
„ N. -	62 57	—	No bottom at 200 fms. Ice setting fast to Ed.
28. N. -	63 8	—	
29. N. -	63 11	74 16	
30. N. -	63 12	64 24	Four white whales.
July.			
1. -	—	—	Several white whales near the ship.
2. -	—	—	Several lanes of water. A white whale.
3. N. -	63 17	74 39	Cut through 30 feet of ice varying from 12 to 14 feet in thickness.
5. -	—	—	A great deal of open water in sight from the masthead. Cutting ice, varying in thickness from 14 to 20 feet or more.
6. N. -	63 20	75 25	Cutting ice from 20 to 26 feet thick.
7. -	—	—	Several large ice-calves came up. Cutting ice from 25 to 30 feet thick. Saw one seal.
9. -	—	—	Several narwhals near the ship.
10. -	—	—	A great deal of open water in sight. Three narwhals and a seal seen.
11. 4 -	—	—	Salisbury Island W.N.W 7 or 8 leagues. Two ice-calves came up. At noon a sudden disruption of the ice, by which the ship was in part liberated; the cutting having been carried on up to this instant.
12. -	—	—	Narwhals seen, and flocks of looms.
13. 4 -	—	—	Set about 11½ miles S.E. since midn.
„ 10 -	—	—	The floe split and a submerged berg threw the ship on her beam-ends.
„ N. -	63 6	—	Ice alongside 4 fms. thick. Several walrus.
14. 4 -	—	—	The ice separated from the ship with a tremendous crash, allowing the ship to come on an even keel.
„ N. -	63 5	74 50	
15. N. -	63 2	74 3	Loose ice.
16. N. -	62 57	—	Loose ice.
17. N. -	62 55	—	Charles Island, S.S.E. 3 or 4 leagues.
18. N. -	62 51	—	
19. -	—	—	A little straggling ice in sight.
20. N. -	62 50	73 0	Loose ice drifting fast Ed. A great deal of open water.
21. N. -	62 41	72 48	Two whales, a narwhal, and a few boatswains seen. Much ice drifting Sd. A large hole of water round the ship at midn.
22. N. -	62 27	72 53	A whale and several morses. Drifting S.S.E. and S.Ed. Large floe pieces.
23. N. -	62 5	72 2	Very slack ice, setting S.Ed. A good deal of open water inshore.
24. N. -	61 44	71 13	Very heavy sailing ice.
25. -	—	—	At 4 a.m., horizon thrown up a good deal by refraction.
26. N. -	61 36	70 35	2 a.m., heavy ice; midn. loose ice.
27. N. -	61 28	69 44	2 a.m., sailing ice; midn. faint aurora N.W.
28. N. -	61 19	69 11	Two bergs in sight. Ice closely packed.
29. N. -	61 16	69 11	At 4, a ground swell from S.E. Several flights of ducks passing Nd. At 6 p.m., a great deal of refraction. Midn., ice perfectly close.
30. N. -	60 59	69 18	At 8 a.m., slight swell. At 11 p.m., aurora from E. to W.
31. -	—	—	Ice close.

No. IX.

Results of Meteorological Observations made at Griffith Island.

DURING the voyage of H.M.S. "Resolute," the senior officer's ship of the squadron under the command of Captain, afterwards Admiral, Sir Horatio T. Austin, sent to the Arctic Regions in 1850 in search of the missing expedition under the command of Sir John Franklin, a meteorological register was kept every two hours. The observations, from which the results here discussed have been deduced, were made in winter quarters near Griffith Island, in latitude 74° 34′ N., longitude 95° 20′ W. The original register was lent by the Record Office, and, as it does not contain any entries of the ship's positions, the log-book was also borrowed from the Admiralty. From the latter document some useful and interesting facts were obtained, besides the positions of the ship, and these facts have been incorporated in the remarks appended to the results of the observations. The name of the officer who had charge of the register is nowhere mentioned. The makers' names and the distinguishing numbers on the instruments used are not recorded in the register. The Admiralty supplied this ship with three marine barometers by Newman, M. 51, 117, 118, and four aneroids by Dent, Z. 54, 71, 72, 73, probably for distribution among the squadron, namely, the "Resolute," "Assistance," "Pioneer," and "Intrepid." No. 118 is now, and has been since 1856, in the Meteorological Office. A statement in the register fortunately records that the standard barometer was used, and that it requires for correction, on account of capillarity +·025, capacity $\frac{1}{36}$, neutral point being 29·92. These very same data for correction are engraved on the scale of No. 118, and, as it is altogether improbable that No. 117 had precisely the same errors, it would seem that No. 118 was the identical instrument used, No. 51 being of a different construction, and not a standard. When the corrections derived from these data are applied, this barometer reads precisely the same as the Meteorological Office standard barometer, according to comparisons made in the year 1876; so that the observations made with it on board the "Resolute" may be accepted as perfectly reliable. The frame and scale are brass, and, except that its tube is rather too free in the bore for a marine barometer, it is in all respects a standard instrument, bearing out to the full the reputation for accuracy justly accredited to Newman's meteorological instruments. The observations from the barometer have all been corrected and reduced to the temperature of 32°, and to the sea-level.

The thermometrical observations may also be regarded as thoroughly trustworthy; because the thermometers supplied to Arctic expeditions have always been specially constructed, and by makers of high repute. There is in the Meterological Office

a thermometer bearing the following record on the back of its boxwood scale, written in ink:—"This thermometer, being nearly a mean of eleven others, tried "at temperatures varying between 0 and −46°, was selected as a standard for the "winter, and was placed accordingly on the fixed ice fifteen yards from the ship. It "is thus marked in order that comparative measures may hereafter be made with it, "as also any with reference to the journal kept by the officers of the 'Resolute.' This "thermometer showing on several occasions −39° mercury began to consolidate, −39°·5 "it was no longer in a fluid state, and at −40° it could have been propelled by powder. "(Signed) Horatio T. Austin, H.M.S. "Resolute," 1851, October 9th." The writing is evidently by Captain Austin's own hand. This thermometer, marked Pastorelli N 19, contains bright ruby-coloured spirit, the colour having in no way deteriorated. It is not divided on the stem, but well secured to a divided scale on a box-wood mount. In 1859, November, it was tested at the Kew Observatory, when the following corrections were found for it: at 32°, +1·9; at 42°, +1·8; at 52°, +1·2; at 62°, +0·6; at 72°, +0·1. In 1867 it was again sent to the Kew Observatory, this time to be verified at the freezing point of mercury, but on account of the frame extending below the bulb and its width, no experiment could be made with it. However, while these observations were under discussion, the importance of testing this instrument below 32° became evident, and Mr. Whipple, the Superintendent of the Kew Observatory, was urged to make another trial. This time the test was accomplished, and the following corrections were furnished in July 1876: at −37°·9, −0°·9; at +12°, +0°·4; at 22°, +1°·4; at 32°, +1°·0; at 42°, +1°·3; at 52°, +0°·8; at 62°, +0°·4; at 72°, 0°·0. This verification confirms the accuracy of the experiments made by Captain Austin. Between the corrections obtained at Kew in 1859 and 1876 there is a discrepancy at 32°, amounting nearly to 1°, probably resulting from an error of observation on the former occasion. No correction whatever has been applied to the thermometrical observations, because the register furnishes no information regarding the thermometers used and when changes were made. The *true* direction of the wind was recorded while in winter quarters.

Table I. exhibits the two-hourly means of the barometer for each month, and for the entire period. These values show that the diurnal range of pressure was almost nil. April had the greatest atmospheric pressure, 30·077; September the least, 29·684.

Table II. contains the two-hourly means of the temperature of the air for each month, and for the entire period. The mean diurnal range of the temperature for the six months, September to February, is very small; for the other six months, March to August, it is only from 6° to 11°, being greatest in May. February was the coldest month, −32°·5; the warmest July, 36°·5; so that the mean range of temperature was 69°. The mean temperature of the period, nearly a year, was zero.

Table III. gives the extremes of the barometer, with the accompanying temperatures wind, and weather for each month. The greatest monthly range was in February, 1·435; the least in April, 0·732 inch. The barometer rose to 30·611 in March, and fell to 28·978 in September, giving an absolute range of 1·663 inches. The winds are

lighter and the weather clearer with the maximum than with the minimum readings of the barometer, but there does not appear any certain difference of temperature.

Table IV. gives the maximum and minimum of the air temperature in each month, with the accompanying height of the barometer, the wind, and the weather. The greatest range of temperature in any month was 57° in April, the least was 33°·5 in December. The absolute maximum was 57° in July, and the absolute minimum was −46° in February, giving an extreme range of 103°. The barometer generally was lower and the weather thicker with the high temperatures than with the low. The highest temperatures in the winter were registered mostly with SE.ly. winds with hazy weather, the lowest with NW.ly. winds and clear weather, but this relation is not maintained in summer.

The thermometer on the floe, the readings from which were not regularly recorded, was generally about 2° colder than the one on board.

Table V. supplies the two-hourly sums of the wind components for each month, with monthly means.

Table VI. brings the two-hourly sums of the wind components together for the entire period of 333 days, and therefrom the two-hourly resultants of the wind have been deduced. These show a maximum force of wind at 3 a.m., and a minimum at 11 a.m., while the direction veers from N. 63° W. at 3 a.m. to N. 76° W. at 11 a.m.

Table VII. contains the monthly resultants of the winds, deduced from the mean value in Table V.

Table VIII. The N.W. is the prevalent wind, especially in the winter. It gives way to frequent S.E. winds in June and July, and September has the greatest share of S.W. winds. In November the resultant was S.E. owing to the greater strength of the winds from that quarter, though they were not so frequent as the N.W. In April the resultant wind was S.W., owing to the great strength of the Sly. wind, though the N.W. winds were the most frequent.

Force 8 and upwards was recorded 9 times in November, 1 in December, 6 in January, 21 in February, 40 in March, 24 in April, 14 in May, 6 in June, 1 in July. These figures must of course be considered as the numbers of two-hourly periods during which the wind reached the force of a gale.

Table IX. furnishes two-hourly notations of the weather, from which it appears that the frequency of mist increased from January to May, then decreased. Fogs were most frequently recorded in July and August; April, May, September had the most snow showers.

Possibly the best popular notions of the weather experienced at this station will be conveyed by the following abstract of papers contributed to the "Aurora," a manuscript newspaper circulated among the squadron during the winter, and written by the officers and seamen. On the return of the expedition, the six monthly numbers were printed under the title "Arctic Miscellanies," and published in London 1852, and is now very scarce. To this a few extracts are added from "Stray Leaves from an Arctic Journal," by Captain (the late Admiral) Sherard Osborn, who commanded the "Pioneer." The

notes from the journal and log of the "Resolute" which follow the tables contain facts of interest and importance; and it is hoped that they will mutually throw light upon each other, and afford valuable material for the study of Arctic Meteorology.

Abstracts from "Arctic Miscellanies."

"At home we are apt to associate everything that is miserable with an arctic climate, but so far we have been agreeably surprised with the enjoyment of a large proportion of serene and beautiful days; we cannot forget those bright sunny ones at the Whalefish Islands in Melville Bay and during the period of navigation. In prosecuting the north passage southerly winds prevailed to greater extent than usual, which had influence in checking the annual progress of the ice to the south. We have no cause to complain of fogs this season; there were few occasions when they caused any inconvenience or delay in pursuing our voyage. As to gales of wind we can draw a favourable contrast with our experience in other regions. The gale of August 20th in Barrow Strait is the only severe one we have to record; since we have been secured in winter quarters we can only recollect *one* day when we were deprived of taking exercise outside the ship with any degree of comfort.

"With reference to temperature, the general opinion appears to be that the sensation of cold has not been felt with that severity which our conceptions had led us to anticipate; the ample supply of everything requisite to comfort, together with the internal accommodation of the ships, has no doubt contributed vastly towards mitigating the severity of the climate experienced by our predecessors. The following table will show the comparative temperatures registered during different voyages, together with our own, by which it appears our temperature for the month of September was below that of the same month at Melville Island in 1819:—

Months.	* Griffith Island, 1850–1.			Melville Island, 1819–20.			Igloolik, 1822–3.			Port Bowen, 1824–5.		
	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.
September	+40·0	+ 3·0	+20·2	+37·0	− 1·0	+22·5	+37·0	+11·0	+24·4	+34·0	+16·0	+25·9
October	+17·0	−13·5	− 0·3	+17·5	−28·0	− 3·5	+29·0	− 9·0	+12·8	+31·0	−12·0	+10·8
November	+14·0	−30·0	− 6·9	+ 6·0	−47·0	−20·6	+ 8·0	−22·0	−10·4	+17·0	−26·0	− 5·0
December	− 4·0	−39·5	−22·2	+ 6·0	−43·0	−21·8	−10·0	−43·0	−27·8	− 4·5	−35·0	−19·0
January	−11·0	−47·0	−31·9	− 2·0	−47·0	−30·1	+22·0	−45·0	−18·0	−14·5	−42·5	−28·9
February	−13·0	−48·0	−33·0	−17·0	−50·0	−32·2	+20·0	−43·0	−24·4	− 8·0	−45·0	−27·3
Latitude	74° 34′ N.			74° 48′ N.			69° 21′ N.			73° 14′ N.		
Longitude	95° 20′ W.			110° 48′ W.			82° 50′ W.			88° 54′ W.		

* Thermometer taken on the floe, at a distance from the ships, stands 2° lower than that taken on board free from the influence of heat.

"It has been asserted by various authors that there is no thunder and lightning within the Arctic Circle; this we are able to disprove from the fact of a vivid flash being seen, accompanied with a loud report, on the night of the 28th of August, when in Wellington Channel. We have seen no heavy falls of snow. Occasionally when blowing hard a snowdrift has been carried along the surface of the ice with the wind, but seldom extending above the height of the masthead. On these occasions, looking to the zenith, the sky is clear. The particles of snow cannot escape the observation of the most casual observer, which in the process of crystallization assume symmetrical stellar forms in every variety of shape; scarcely any two in fact are found similar. In most Arctic Voyages the absence of snow during winter is generally remarked. The aurora borealis, which hitherto afforded other voyages so much interest, and which some writers allege to be almost constant in these regions, has not yet presented itself with any striking effect to our notice, except on the night of December 1st. A very complete arch in a N.N.W. and S.S.E. (true) direction passing through the zenith, divided the celestial concave into two equal parts; it measured about 5° in width; it lasted about half an hour, and was of a whitish colour. Towards the North it became tinged with red before it disappeared; the stars were seen through it with great brilliancy; they assumed for the time the same colour as the aurora. Some bright coruscations were seen on the morning of the 5th shooting from the S.E. towards the zenith.

"During October, and as the Sun's altitude declined, several very beautiful parhelia were seen; they generally appeared in a semicircle of prismatic hues, measuring about 30° diameter, with a mock sun at the extremities; sometimes accompanied by a rich golden ray shooting up from the Sun towards the zenith, and down to the horizon. On one or two occasions they demonstrated their proximity by appearing between the ships and the land, their base resting on the surface of the floe, producing a singularly beautiful effect, and contrasting with the surrounding wintry scene.

Port Leopold, 1848–9.			Winter Island, 1821–2.			Boothia, Felix, 1830.			Boothia, Felix, 1831.			Boothia, Felix, 1832.		
Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.
+37·6	+ 6·0	+23·2	—	—	—	—	—	—	—	—	—	—	—	—
+32·0	−12·3	+10·0	—	—	—	—	—	—	—	—	—	—	—	—
+16·0	−33·7	−12·8	—	—	—	—	—	—	—	—	—	—	—	—
−12·3	−47·5	−32·5	+12·0	−29·0	−12·9	—	—	—	—	—	—	—	—	—
− 8·6	−45·0	−31·8	− 6·0	−37·5	−23·0	—	—	—	—	—	—	—	—	—
−15·3	−53·0	−31·3	− 4·0	−37·0	−25·0	+ 1·5	−47·0	−29·9	− 9·5	−49·0	−32·5	−12·0	−44·5	−33·7
73° 50′ N. 90° 12′ W.			66° 11′ N. 83° 10′ W.			—			—			—		

"With the low altitude of the Sun the sky was tinged with most delicate and lovely hues, surpassing admiration, particularly that portion in opposition to the Sun, com-

posed of rose and violet colour blending harmoniously until lost in the deep cerulean vault above."

"The barometer appears to retain its reputation in these latitudes as a monitor to the seaman. In Melville Bay it indicated the approach of southerly winds on several occasions with great fidelity. One of the most remarkable instances was July 12, when the mercury fell from 29·25 to 28·88 in the space of six hours."

"The prevailing winds have been N.W."

"The distinctness by which distant objects are seen is a remarkable feature in this climate. Cape Hotham was clearly seen from Griffith Island with the naked eye, November 11th, 2 p.m., a distance of more than 30 miles; the stars were shining at the time."

"We experienced some boisterous weather at the commencement, middle, and end of December accompanied at times by thick gloomy weather, which interrupted the communication between the ships. With one exception only, we have enjoyed exercise under the lee of the ship. The greater portion of the days, however, were clear, and the heavenly bodies shone brightly. The most dreary and the darkest period having passed, it must be generally admitted that the sensation at the deprivation of daylight has not produced the gloom anticipated. The daily decrease of light gradually habituates the mind to the unnatural change; but even when the Sun reached the winter solstitial colure the south horizon was illuminated by refraction of the Sun's rays, and the colouring thus afforded a relief to the eye amidst the icy wilderness. At this period also the full Moon opportunely favoured us with her light for several days."

"The prevailing wind has been N.W., and blew from that quarter for 22 days of December. It blew a fresh gale on the 2nd and 3rd, also on the 13th and 14th. The heaviest gale yet experienced in these quarters, and of the longest continuance, set in on the evening of the 30th, and blew with great force constantly until the morning of January 1st, 1851. These gales caused a vast accumulation of snowdrift along the northern sides of the ships.

"December set in with a rapid fall of temperature to −31°; the preceding midnight the thermometer having stood at zero. The severest day was the last of the year, when the thermometer showed −40°·5 at a distance from the ship. On this occasion mercury congealed."

"Cloudy weather is generally attended by a rise of the thermometer, a fact observed by other arctic navigators."

"The temperature has been observed to range 12° in the space of four hours."

"The aurora has been observed 11 times during the month, but generally of a faint tinge. . . . During its presence the heavenly bodies were always very bright. Many theories are advanced concerning these phenomena, one of which being that they move in columns parallel with the magnetic meridian, which is at variance with its movements in this locality."

"Several paraselenæ were observed when the Moon was at a low altitude, consisting of a white halo forming the segment of a circle, with a mock moon at the extremities of the horizontal diameter, with occasionally a vertical white ray intersecting the disc of the Moon. The mock moons are sometimes tinged with the prismatic hues. Remarkable haloes have been observed round the Moon of an elliptical form, with the major axis vertical, or more nearly approaching the form of an egg, having its base towards the zenith; the proportion of the vertical to the horizontal diameter being about 4 to 3."

"It may be interesting to know that a cubic foot of snow was found to weigh 30 lbs. by a Salter's spring-balance after making corrections. The snow was extracted at a depth of four inches below the surface. On referring to Parry's voyage precisely the same result is given."

"Looking along the horizon extending from Griffith Island, a vapour may frequently be seen, or what is commonly termed frost smoke, which rises from the surface of the water in extreme cold. This probably may result from the rents in the ice occasioned by the action of the tides."

The thickness of the ice is here inserted, the dimensions being taken as near to the same spot as possible:—

Positions.	Nov. 22.	Dec. 22.	Jan. 21.
	inches.	inches.	inches.
On old floe - - - -	33	35	49
In canal - - - -	24½	38	52
Pressed up young ice - - -	31	40	49
Ice last formed - - - -	23	36	48
Average of snow on young ice - -	2½	3	—
" " old ice - -	7	5	—

"January was ushered in during a heavy gale from N.W., and throughout the month the average force of the wind has exceeded that of the preceding months. The temperature has also been considerably lower. From 13th to 20th inclusive the weather was unusually severe, the mean temperature of these eight days being −42·5; the maximum, −34°; the minimum, −47°, showing a range of only 13°. The winds have still prevailed from the N.W. quarter, and they may be said to be almost constant from that direction, having continued for 26 days out of the month in the N.W.; the remaining days they were variable, changing suddenly in gusts to various points of the compass. At times an upper current of wind has been perceptible, the heavens having become obscured by a mist carried up from a southerly direction in opposition to a

N.W. breeze, a fall in the barometer, and a rise in temperature at the same time, indicating some atmospheric change. On these occasions snow has fallen in very minute particles. On the 23rd the barometer fell to 29·34, the only apparent cause being a fog bank then pervading the south horizon, which on the following day was observed to overspread the sky in opposition to a N.W. wind. Snowdrifts have always accompanied strong winds, causing a thick mist, though clear in the zenith.

"The aurora has been seen more frequently, though never with that brilliancy by which it is often characterised in these regions. The number of observations in the month of any importance amount to 12. The coruscations, when detached, flitted from various points of the horizon in light fleecy clouds towards the zenith, sometimes of a straw colour. When it has appeared in an arch, its direction has been nearly N. and S., passing across the zenith. On the evening of the 20th, luminous beams of the aurora were frequent from the S.W. to the N.W., and continued for several hours; on the following day we had fresh winds from the S.W. It has been observed that when this phenomenon appears unusually intense in any particular quarter, that a strong breeze has succeeded it from that particular direction of the compass."

"There has been a larger proportion of falling snow this month than in the foregoing, though in England our definition of the term snow differs so materially with its shape and appearance; it is therefore necessary to state that in this locality it consists of very minute particles, almost imperceptible until observed to fall on some dark substance, but in the course of an hour or two the quantity which accumulates is surprising. It may not have escaped observation during the summer, when looking through the rays of the sun, to perceive minute particules of frozen vapour, sparkling as they descend, like motes in a sunbeam, though the atmosphere to all appearance was quite clear.

"Paraselenæ were seen, but mostly imperfect, without any remarkable feature, and an elliptical halo surrounding the Moon has been frequent during its first and last quarters.

"Some very remarkable cases of refraction occurred when the Moon rose in the S.E. As this luminary appeared in the horizon, her shape was so distorted as hardly to be recognised, particularly on the 8th and 9th. The weather at the time was tranquil and clear, light airs from N.W., barometer 29·85, thermometer −30°. The edges of the Moon when seen through a glass were fringed with a light green and crimson border.

"An increase of light was perceptible in the first week of January, when the arch to the S. daily expanded, showing that the Sun was evidently on the return. The 10th was the first day the tinge of red colour was observed in the northern part of the sky, such as had been watched during the departure of the Sun. From some atmospheric cause these tints were not visible again until the 21st, when a beautiful arch again appeared towards noon extending from N.E. to N.W., the centre of arch being 10° above the north meridian. It first appeared blue and indigo, changing to violet and rose colour of most delicate hues. As the light at noon increased, these tints

became more brilliant. On the 22nd, none but stars of the first magnitude were visible at noon, and on the 26th the increase of light rendered them altogether invisible."

"According to anticipation, and the experience of most previous voyagers, February has proved to be the severest of the winter months. The force of the wind has generally been greater, we have had a greater proportion of obscure days, and more falling snow than any of the preceding months.

"In consequence of thick weather the Sun could not be seen until three days after the one calculated for its appearance on the horizon; on the fourth, about noon, a vertical pink streak near the meridian indicated its position; on the 7th, at 11 a.m., the glorious orb was seen from the masthead, and immediately after was visible from the deck, bearing S.S.E. Owing to a fog bank along the south horizon, its upper semi-diameter only appeared. The altitude of its upper limb was about 1°½; for this position, at so low an altitude, its brilliancy was very remarkable, the day was colder than any other of the season, the thermometer showing −47°, barometer 29·75. It was absent from our sight 95 days."

"As in the two former months, we were visited with gales of wind, at the full and change of the Moon, attended with heavy snowdrift, causing great accumulation round the ships; and the month concluded with a strong N.W. gale. The winds have blown 20 days from the N.W. and eight days variable and southerly.

"The aurora has appeared bright on four occasions, generally in the form of an arch, from the S.E. quarter, towards the N. On the night of the 25th it was more brilliant than on any other occasion this season, making an arch, from the S.E. to the N., with coruscations shooting off laterally from it towards the zenith."

The following extracts relating to the weather experienced at the winter quarters 1850–1, at Griffith Island are taken from "Stray Leaves from an Arctic Journal," by Sherard Osborn:—

"With one portion of the phenomena of the North Sea we were particularly disappointed, and this was the aurora. The colours in all cases were vastly inferior to those seen by us in far southern latitudes, a pale golden or straw colour being the prevailing hue, the most striking part of it was its apparent proximity to the earth. Once or twice the auroral coruscations accompanied the Moon in its last quarter, and generally previous to bad weather. On one occasion in Christmas week the light played about the edge of a low vapour which hung at a very small altitude over us; it never on this occasion lit up the whole under-surface of the said clouds, but formed a seies of concentric semicircles of light with dark spaces between, which waved, glistened, and vanished like moonlight upon a heaving but unbroken sea.

"At other times a stream of the same coloured vapour would span the heaven through the zenith, and from it would shoot sprays of pale orange colour for many hours, and then the mysterious light would again as suddenly vanish.

"Clouds may have been said to have absented themselves from our sky for at least two months of the winter; the heavens, the stars, and Moon were often obscured, but it invariably appeared to be from snowdrift rather than from a cloudy sky. Snow fell incessantly, even on the clearest day, consisting of minute spiculæ, hardly perceptible to the eye, but which accumulated rapidly, and soon covered anything left in the open air for a few minutes. With returning daylight and the promise of the Sun, clouds again dotted the southern heavens, and mottled with beautiful mackerel skies the dome above us.

"The immense quantity of snow which in a gale is kept suspended in the air by the action of the wind, and is termed drift, quite astounded us; and on two occasions with north-westerly gales we had a good opportunity of noting its accumulation. The "Pioneer" and "Intrepid" laying across the wind, the counter-current caused a larger deposition around us than elsewhere. On the first occasion, after the wind subsided, we found a snow-wreath along the weather side of the vessel for a length of 180 feet, about 11 feet deep in the deepest part, and sloping gradually away for 100 yards. After weighing a cubic foot of the snow I calculated that, at the lowest computation, the mass thus deposited in 24 hours was not less than 400 tons in weight! How the floe bore the pressure seemed unaccountable to me; but it did around the "Pioneer," although that near the "Intrepid" broke down, and the water flowed up above the snow, forming it rapidly into ice.

"Much later in the winter,—indeed in the month of March,—a succession of furious gales quite smothered us; the drift piled up as high as the top of the winter housing, which was 15 feet above the deck, and then blew over to leeward, filling up on that side likewise; whilst we, unable to face the storm without, could only prevent the housing from being broken in by placing props of planks and spars to support the superincumbent weight."—Pages 164-7.

"On two occasions I distinctly saw the balloons, when started with S.E. winds, pass for a while to the N.W., and then at a great altitude alter course under the influence of a contrary current, and pass as rapidly to the S.E., in the teeth of the light airs we had on the floe."—Page 173.

TABLE I.

MEAN BAROMETRICAL PRESSURE AT GRIFFITH ISLAND, 1850 September 12th, to 1851 August 10th.

Hours.	1850.				1851.								Year.
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	
1 a.m. - -	29·668	29·950	29·906	29·845	29·730	29·812	29·844	30·078	30·000	29·981	29·817	29·823	29·871
3 „ - -	·673	·949	·905	·848	·732	·820	·848	·079	29·999	·983	·817	·831	·874
5 „ - -	·670	·947	·906	·844	·731	·822	·843	·076	30·000	·986	·815	·837	·873
7 „ - -	·674	·945	·907	·842	·729	·824	·849	·074	29·992	·983	·811	·849	·873
9 „ - -	·681	·943	·912	·844	·728	·832	·847	·076	·991	·986	·803	·858	·875
11 „ - -	·683	·940	·911	·839	·730	·834	·843	·073	·990	·983	·799	·862	·874
1 p.m. - -	·687	·940	·907	·841	·730	·833	·841	·071	·993	·987	·796	·875	·875
3 „ - -	·690	·945	·915	·842	·734	·834	·846	·074	·993	·986	·797	·892	·879
5 „ - -	·691	·950	·917	·842	·740	·841	·851	·080	·993	·988	·803	·897	·883
7 „ - -	·698	·950	·918	·832	·738	·843	·855	·084	·999	·985	·801	·905	·884
9 „ - -	·701	·948	·914	·828	·735	·844	·849	·084	·994	·986	·801	·903	·882
11 „ - -	·696	·942	·914	·822	·727	·842	·845	·081	·987	·983	·801	·905	·879
Mean - -	29·684	29·946	29·911	29·839	29·732	29·832	29·847	30·077	29·994	29·985	29·805	29·870	29·877

TABLE II.

MEAN TEMPERATURE AT GRIFFITH ISLAND, 1850 September 12th, to 1851 August 10th.

Hours.	1850.				1851.								Year.
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	
1 a.m. - -	+15°·1	−1°·3	−7°·9	−23°·2	−30°·5	−33°·1	−27°·5	−11°·5	+ 3°·0	+29°·2	+33°·2	+32°·9	−1°·8
3 „ - -	14·6	1·6	8·2	23·3	31·2	32·9	27·7	11·9	3·2	29·6	33·9	31·9	2·0
5 „ - -	14·3	1·9	8·5	23·5	31·2	33·2	28·2	10·2	4·9	30·3	35·0	32·5	1·6
7 „ - -	14·8	1·4	7·8	23·6	31·3	33·7	27·4	7·9	7·8	31·4	36·4	34·2	−0·7
9 „ - -	15·8	−0·1	6·8	23·7	31·3	33·4	25·4	5·9	11·2	33·4	37·8	36·9	+0·7
11 „ - -	16·7	+0·7	6·6	23·2	31·3	32·6	23·4	3·5	13·0	34·2	40·6	37·1	1·8
1 p.m. - -	17·2	0·8	6·8	22·5	31·3	31·8	21·9	2·4	14·5	34·7	40·1	38·0	2·4
3 „ - -	17·2	0·4	6·7	22·4	31·0	31·6	21·9	2·3	14·4	34·3	39·7	37·9	2·3
5 „ - -	16·7	+0·1	7·3	22·6	30·9	31·4	24·3	3·7	12·5	34·0	37·5	38·4	1·6
7 „ - -	15·9	−0·1	7·3	22·5	30·5	31·9	25·9	5·4	10·9	33·4	35·3	37·9	+0·8
9 „ - -	14·9	0·9	7·7	22·5	30·7	32·0	26·5	8·8	9·3	31·4	34·7	35·2	−2·4
11 „ - -	+14·6	−1·5	−8·7	−22·7	−30·6	−32·2	−26·9	−10·5	+ 6·7	+30·3	+33·3	+33·5	−1·2
Means - -	+15·7	−0·6	−7·5	−23·0	−31·0	−32·5	−25·6	− 7·0	+ 9·3	+32·2	+36·5	+35·0	+0·1

Table III.

Extremes of Atmospheric Pressure, with accompanying Temperature, Wind, and Weather, at Griffith Island, 1850 September 12th, to 1851 August 10th.

Month.	Date.		Max.	Temp.	Wind.	Weather.	Date.		Min.	Temp.	Wind.	Weather.	Range.
	d.	h.	inches.	°			d.	h.	°	inches.			inch.
September 1850 -	14	9	30·055	+ 8·5	W.S.W. 1	b c	20	3	28·978	+30·0	N.E. 2	o c s	1·077
October - „ -	14	9	·556	+ 2·5	Calm	b	20	13	29·608	− 3·0	N.W. 2	b c	·948
November „ -	25	19	·421	−10·5	„	b c m	10	5	·149	+ 5·0	E.S.E. 7	c m g	1·272
December „ -	0	23	·158	34·5	N.W. 2	b m	31	11	·315	−24·0	N.W. 8	b m q	·843
January 1851 -	26	21	·252	30·0	„ 3	b	1	13	·199	36·0	„ 4	b	1·053
February „ -	27	7	·578	40·0	S. 2	„	1	1	·143	34·0	„ 2	b c	1·435
March „ -	17	5	·611	34·0	Calm	„	3	5	·304	26·5	„ 2	b c m	1·307
April „ -	29	21	·376	− 6·0	S.S.E. 3	„	3	17	·644	−12·0	S.E. 3	„	·732
May „ -	11	17	·492	0·0	N.W. 3	b c v	21	3	·550	+15·0	N.N.W. 8	o m	·942
June „ -	3	11	·326	+16·0	S.E. 1	b c	18	7	·537	34·0	S.W. 8	o s	·789
July „ -	0	13	·200	33·0	N.W. 2	„	28	1	·128	38·0	N.W. 7	o c q g	1·072
August „ -	10	11	·508	+33·0	Calm	f	2	17	·020	+32·5	N.E. 2	o f s	1·488
Year - -	March.		30·611	—	—	—	Sept.		28·978	—	—	—	1·633

Table IV,

Extremes of Air Temperature, with accompanying Pressure, Wind, and Weather, at Griffith Island, 1850 September 12th, to 1851 August 10th.

Month.	Date.		Max.	Bar.	Wind.	Weather.	Date.		Min.	Bar.	Wind.	Weather.	Range.
	d.	h.	°	inches.			d.	h.	°	inches.			°
September 1850 -	19	21	+30·0	29·027	N.E. 4	o c	12	17	+ 3·0	29·770	W. 4	b c m q	27·0
October „ -	1	23	17·0	·709	S. 2	o c m	28	9	−19·0	·985	Calm	b c	36·0
November „ -	10	21	+13·0	·359	N.E. 3	m	30	11	31·0	30·094	N.W. 5	b m	44·0
December „ -	22	19	− 6·0	·703	S.S.E. 2	o m s	30	19	39·5	29·490	„ 5	b c	33·5
January 1851 -	10	13	9·0	·573	S. 3	o q s	19	13	45·0	·784	„ 1	b	36·0
February „ -	16	3	11·5	·368	S.E. 6	b c m	24	11	46·0	30·359	„ 1	„	34·5
March „ -	14	1	− 8·0	·650	„ 6	m c	20	23	43·0	·023	„ 9	m q	35·0
April „ -	20	5	+28·0	·718	N.W. 1	o m s	26	13	29·0	·292	„ 4	b c	57·0
May „ -	31	1	34·0	30·132	E. 1	„	0	13	−20·0	·287	„ 4	b c m	54·0
June „ -	23	1	52·0	29·918	N. 1	b v	3	15	+10·0	·317	E.S.E. 2	b c	42·0
July „ -	5	23	57·0	·916	S.W. 2	b c	3	11	27·5	·117	S.E. 2	„	29·5
August „ -	7	3	+47·0	30·213	W. 1	o c	3	15	+30·0	29·376	N.W. 2	„	17·0
Year - -	July.		+57·0	—	—	—	Feb.		−46·0	—	—	—	103·0

Table V.

Sums of Wind Components, Griffith Island, 1850 September 12th, to 1851 August 10th.

Hour.	September, 1850.				October, 1850.				November, 1850.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
1 a.m. -	18·0	24·5	7·4	20·5	34·0	6·3	4·3	36·2	14·6	27·7	36·2	12·5
3 „ -	18·1	27·1	9·2	18·8	32·1	8·0	4·7	34·2	15·8	26·9	33·6	15·8
5 „ -	16·0	21·5	11·3	21·6	31·5	13·9	7·1	31·4	18·4	28·8	41·5	14·5
7 „ -	14·7	22·6	11·3	19·5	30·4	14·6	9·4	32·6	15·1	28·0	40·7	14·4
9 „ -	13·1	24·7	8·0	19·4	25·8	14·1	10·1	31·2	22·4	27·5	28·2	21·9
11 „ -	14·1	27·0	9·3	19·6	27·4	14·7	10·4	33·2	20·3	31·2	31·2	23·4
1 p.m. -	13·3	20·9	11·5	19·5	34·3	16·8	11·5	31·0	22·7	28·7	29·9	28·6
3 „ -	14·7	20·3	9·8	19·3	30·1	16·4	10·6	28·3	21·1	30·4	32·8	28·6
5 „ -	13·6	20·9	13·1	18·0	25·5	12·4	6·3	27·3	20·2	25·5	31·1	19·3
7 „ -	14·4	18·8	13·4	16·5	28·2	8·5	4·1	29·2	16·7	30·7	35·5	18·4
9 „ -	15·4	21·7	8·6	19·6	27·8	6·4	8·8	25·8	19·6	31·2	32·8	23·3
11 „ -	14·9	27·6	4·8	24·1	25·3	4·2	4·8	25·3	21·6	32·5	31·1	25·8
Means -	15·0	23·1	9·9	19·7	29·4	11·4	7·7	30·5	19·0	29·1	33·7	20·5

(*continued.*)

Hour.	December, 1850.				January, 1851.				February, 1851.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
1 a.m. -	42·5	13·5	4·5	55·0	54·0	6·5	3·5	49·7	40·3	16·9	12·4	41·7
3 „ -	37·8	11·0	7·3	46·1	55·8	3·5	3·5	52·5	39·3	18·7	13·2	41·7
5 „ -	46·1	12·6	8·4	51·4	55·0	2·8	2·8	57·0	43·5	18·5	14·5	41·8
7 „ -	42·5	13·1	7·5	48·2	52·7	2·5	1·7	54·5	41·9	22·0	19·0	38·1
9 „ -	38·6	9·1	6·0	48·8	46·1	2·0	—	45·9	40·7	19·3	16·3	36·8
11 „ -	42·5	8·8	8·5	51·1	48·5	2·8	—	48·4	38·5	20·6	15·8	40·0
1 p.m. -	49·0	12·6	9·7	52·1	42·8	3·0	—	41·6	37·4	26·8	13·2	38·5
3 „ -	43·5	16·1	4·3	53·5	44·1	4·8	2·8	43·1	40·7	26·0	11·7	43·7
5 „ -	40·0	16·4	3·6	47·3	42·9	4·8	2·8	41·8	39·4	26·1	10·7	39·3
7 „ -	41·2	17·4	3·4	49·8	41·5	4·5	3·5	40·4	37·4	22·3	6·4	45·0
9 „ -	40·1	17·7	6·0	45·7	48·4	7·0	2·8	52·3	36·6	25·3	14·5	40·9
11 „ -	43·5	21·4	4·4	49·4	50·7	7·9	2·1	55·4	43·8	21·7	12·4	41·6
Means -	42·3	14·1	6·1	49·9	48·5	4·3	2·1	48·6	40·0	22·0	13·3	40·8

Table V. (*concluded*).

Sums of Wind Components, Griffith Island, 1850 September 12th, to 1851 August 10th—*concluded*.

Hours.	March, 1851.				April, 1851.				May, 1851.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
1 a.m. -	65·3	18·2	14·2	64·3	45·8	43·8	18·7	51·0	49·5	27·2	10·3	78·6
3 „ -	64·0	18·2	13·2	63·0	45·9	39·7	22·8	47·2	56·6	29·4	7·7	89·2
5 „ -	66·2	17·2	17·4	69·5	38·2	47·7	29·3	41·5	51·0	33·0	9·4	80·5
7 „ -	64·3	19·2	17·4	67·1	33·6	42·0	28·0	32·6	44·2	25·0	10·4	66·0
9 „ -	58·2	19·9	19·6	57·8	33·8	44·1	26·1	35·0	41·8	35·0	9·9	59·5
11 „ -	52·4	19·9	18·5	54·1	30·3	41·2	26·8	32·9	42·0	28·3	14·2	60·7
1 p.m. -	64·7	17·9	23·2	64·5	24·4	38·7	30·0	29·1	52·9	28·2	13·0	60·9
3 „ -	66·6	14·4	19·3	64·6	25·0	42·9	34·2	28·0	51·8	30·1	12·9	56·9
5 „ -	55·3	12·4	15·8	59·2	23·7	35·7	19·7	32·4	49·4	21·0	4·0	62·1
7 „ -	59·8	12·8	15·2	62·1	23·9	33·4	19·5	32·5	45·0	18·8	7·5	57·2
9 „ -	52·7	13·9	17·7	58·9	32·0	42·2	23·1	33·7	46·6	23·1	8·8	63·3
11 „ -	58·0	15·0	16·2	58·6	34·1	43·7	26·9	37·9	48·6	26·9	8·8	63·8
Means -	60·6	16·6	17·4	62·0	32·6	41·3	25·4	36·2	48·3	27·2	9·7	66·6

(*continued.*)

Hours.	June, 1851.				July, 1851.				August, 1851.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
1 a.m. -	26·1	40·7	15·8	34·3	23·0	34·9	24·2	48·4	13·6	3·5	3·5	18·5
3 „ -	35·5	43·4	19·5	32·3	24·4	27·6	21·6	54·4	12·2	4·2	4·2	19·5
5 „ -	34·9	39·0	15·3	36·7	15·4	38·2	20·6	52·8	13·6	7·0	5·6	15·5
7 „ -	36·6	39·9	12·8	46·7	14·1	38·8	22·2	46·9	15·2	2·8	4·3	13·7
9 „ -	25·1	45·2	14·2	36·4	10·7	42·3	25·7	42·4	13·5	8·2	7·1	14·6
11 „ -	21·4	45·6	13·7	42·8	8·2	46·9	23·8	37·1	15·8	7·4	7·7	15·0
1 p.m. -	23·4	42·6	16·7	44·3	20·8	30·6	15·2	56·6	14·8	7·7	11·0	11·4
3 „ -	26·5	43·1	17·9	43·3	20·3	33·9	14·2	48·8	13·2	5·7	11·3	12·1
5 „ -	24·5	37·8	19·4	39·7	12·5	33·7	21·0	32·3	11·3	4·2	10·1	9·8
7 „ -	21·6	37·0	17·8	43·1	15·1	41·5	20·5	41·6	8·0	3·5	3·5	9·6
9 „ -	25·7	40·1	20·1	40·2	18·4	30·8	20·5	42·4	7·2	4·2	4·2	12·4
11 „ -	26·7	34·7	12·4	39·7	16·1	34·3	20·5	51·5	7·3	5·3	4·9	10·8
Means -	27·3	40·8	16·3	40·0	16·6	36·1	20·9	46·3	12·1	5·3	6·5	13·6

Table VI.

Sums of Wind Components and Resultant Winds, for the Period 1850 September 12th, to 1851 August 10th, at Griffith Island.

Hours.	Components.				Resultants.	
	N.	S.	E.	W.	Direction.	Force.*
1 a.m. - -	426·7	263·7	155·0	510·7	N. 65° W.	395
3 „ - -	437·5	257·7	160·5	514·7	N. 63 W.	400
5 „ - -	429·8	280·2	183·2	514·2	N. 66 W.	367
7 „ - -	405·3	270·5	184·7	480·3	N. 66 W.	330
9 „ - -	369·8	291·4	172·2	449·7	N. 74 W.	289
11 „ - -	361·4	294·4	179·9	458·3	N. 76 W.	287
1 p.m. - -	400·5	274·5	184·9	478·1	N. 67 W.	320
3 „ - -	397·6	284·1	181·8	470·2	N. 69 W.	310
5 „ - -	358·3	250·9	157·6	428·5	N. 68 W.	290
7 „ - -	352·8	249·2	150·3	445·4	N. 71 W.	313
9 „ - -	370·2	263·6	167·9	458·5	N. 70 W.	309
11 „ - -	390·6	275·2	149·3	483·9	N. 71 W.	355
Mean - -	391·7	271·3	169·0	474·6	N. 68 W.	330

* These numbers must be divided by 333, the number of days, to get the mean force by Beaufort's scale.

Table VII.

Monthly Resultants of the Wind at Griffith Island, 1850 September 12th, to 1851 August 10th.

Month.	Resultants.	
	Direction.	Force.†
September 1850 - -	S. 50° W.	0·67
October „ - -	N. 53 W.	0·91
November „ - -	S. 53 E.	0·57
December „ - -	N. 57 W.	1·68
January 1851 - -	N. 46 W.	2·06
February „ - -	N. 57 W.	1·18
March „ - -	N. 45 W.	2·06
April „ - -	S. 51 W.	0·47
May „ - -	N. 69 W.	1·97
June „ - -	S. 60 W.	0·91
July „ - -	S. 53 W.	1·03
August „ - -	N. 46 W.	0·99

† Mean force by Beaufort's scale.

Table VIII.

Summary of Winds, referred to Sixteen Points, with Mean Force (Scale 0 to 12), Griffith Island.

Months.	Total Observations.	N.		N.N.E.		N.E.		E.N.E.		E.		E.S.E.		S.E.		S.S.E.	
		O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.
1850.																	
September	228	15	3·1	3	3·7	6	2·7	7	3·1	11	1·8	17	2·1	12	2·0	15	2·5
October	372	7	1·7	8	1·9	2	3·0	—	—	2	1·0	14	1·6	41	1·8	11	1·8
November	360	13	2·7	3	5·3	11	1·8	5	2·4	20	2·4	35	5·0	70	3·3	5	1·4
December	372	8	1·3	—	—	14	1·8	2	1·5	3	2·7	5	2·6	13	2·0	6	3·5
1851.																	
January	372	6	1·2	—	—	—	—	—	—	—	—	1	3·0	11	2·6	2	2·0
February	336	14	1·9	—	—	4	3·3	1	5·0	—	—	9	8·0	18	6·6	4	1·3
March	372	1	1·0	—	—	9	1·8	3	1·3	13	2·0	7	2·6	51	4·4	4	3·5
April	360	—	—	—	—	6	2·2	4	2·0	5	3·0	21	2·3	70	3·5	24	4·7
May	372	3	5·3	—	—	8	1·9	1	5·0	6	1·2	7	1·9	34	3·0	4	5·3
June	360	20	2·1	2	2·5	17	3·4	—	—	8	5·8	3	2·7	48	2·2	18	3·0
July	372	1	2·0	—	—	—	—	—	—	12	3·7	17	2·2	100	2·4	8	2·1
August	120	1	3·0	5	4·6	1	2·0	—	—	3	3·7	1	4·0	26	2·7	2	3·5

(*continued.*)

Months.	S.		S.S.W.		S.W.		W.S.W.		W.		W.N.W.		N.W.		N.N.W.		Variable.		No. of Calms.
	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	
1850.																			
September	20	3·7	23	3·5	30	2·6	9	2·4	12	3·6	9	4·9	11	3·2	17	3·9	—	—	11
October	10	1·9	13	2·3	6	2·2	—	—	10	2·8	18	1·9	151	2·5	12	3·0	5	1·0	62
November	17	1·7	6	4·0	27	3·0	—	—	2	1·0	14	3·0	87	2·2	3	1·3	—	—	42
December	6	2·5	8	4·3	23	4·3	5	4·0	8	3·1	15	3·1	207	2·7	14	4·8	6	1·0	29
1851.																			
January	6	2·3	2	2·0	2	6·5	—	—	2	1·0	7	3·1	278	2·7	14	3·7	7	1·1	34
February	26	3·8	1	1·0	10	4·8	1	3·0	3	2·0	9	4·7	192	2·9	11	2·1	1	1·0	32
March	9	3·0	3	1·0	2	4·0	—	—	4	4·3	10	2·1	232	4·0	1	2·0	3	1·0	20
April	16	5·5	14	7·6	4	4·3	—	—	3	1·7	14	3·5	149	3·1	10	3·2	5	1·0	15
May	7	6·1	8	5·8	43	4·3	8	3·4	12	3·6	37	3·3	164	3·8	15	4·7	1	1·0	14
June	36	3·8	18	4·8	52	3·5	11	4·0	3	2·7	21	4·1	79	3·0	14	3·1	—	—	10
July	2	1·0	11	2·9	53	4·2	19	4·6	18	3·9	22	4·2	80	2·6	4	2·8	7	1·4	18
August	1	2·0	1	2·0	1	2·0	1	1·0	5	1·6	22	3·9	31	3·1	5	3·2	1	3·0	13

Table IX.

Weather Notations at Griffith Island, 1850 September 12th, to 1851 August 10th.

Hours.	September, 1850.								October, 1850.								November, 1850.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
1 a.m.	1	6	12	2	1	—	4	4	9	8	14	6	2	—	2	2	9	6	15	8	2	—	3	4
3 „	1	7	11	2	3	—	3	3	13	7	11	8	2	—	2	2	8	8	14	8	3	—	2	3
5 „	2	6	11	1	4	—	4	3	13	6	12	8	2	—	2	1	6	9	15	11	2	—	3	2
7 „	3	8	8	3	2	—	4	2	13	7	11	9	2	—	1	2	7	7	16	12	3	—	2	3
9 „	3	8	8	4	—	—	5	1	11	10	10	8	5	—	2	—	6	6	18	12	3	—	—	1
11 „	3	7	9	6	—	—	8	1	11	9	11	8	5	—	2	1	5	8	17	11	5	—	1	2
1 p.m.	2	6	11	4	1	—	6	1	10	11	10	10	4	—	1	—	7	9	14	11	2	—	1	3
3 „	3	8	8	3	1	—	3	1	10	11	10	9	3	—	2	—	6	8	16	12	2	—	2	3
5 „	3	5	11	3	—	—	4	—	10	11	10	8	1	—	2	—	8	6	16	12	3	—	2	3
7 „	2	6	11	3	—	—	4	—	12	9	10	7	2	—	2	—	9	5	16	12	2	—	1	4
9 „	3	6	10	1	3	—	3	1	13	8	10	10	1	—	3	1	8	9	13	10	2	—	1	4
11 „	3	5	11	2	3	—	5	4	12	7	12	10	2	—	2	—	8	10	12	12	1	—	1	5
Days of	2	7	10	3	2	—	4	2	11	9	11	8	3	—	2	1	7	8	15	11	3	—	2	3

(*continued.*)

Hours.	December, 1850.								January, 1851.								February, 1851.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
1 a.m.	15	9	7	6	1	—	1	1	15	11	5	10	—	—	2	5	6	15	4	12	—	—	—	5
3 „	16	7	8	5	1	—	1	4	15	11	5	12	—	—	1	4	4	19	5	13	—	—	—	6
5 „	15	9	7	7	1	—	1	2	15	9	7	12	—	—	4	5	1	22	5	14	—	—	—	7
7 „	14	10	7	7	—	—	2	1	14	11	6	12	—	—	3	5	1	21	6	14	—	—	—	8
9 „	16	8	7	7	—	—	2	1	11	15	5	10	—	—	3	4	—	23	5	11	—	—	—	4
11 „	15	10	6	6	—	—	2	2	10	16	5	7	—	—	2	4	3	20	5	11	—	—	—	6
1 p.m.	13	11	7	7	1	—	—	1	8	19	4	11	1	—	—	1	5	17	6	14	—	—	—	2
3 „	13	12	6	7	2	—	—	2	7	20	4	12	1	—	—	1	4	18	6	13	—	—	—	2
5 „	14	11	6	7	1	—	1	2	6	21	4	12	2	—	2	1	2	21	5	16	—	—	—	2
7 „	15	12	4	12	—	—	1	2	10	18	3	14	—	—	3	1	4	19	5	13	—	—	—	3
9 „	16	11	4	11	—	—	2	1	12	15	4	13	—	—	2	5	6	14	8	14	—	—	1	6
11 „	15	12	4	7	—	—	1	3	11	16	4	13	—	—	2	5	8	12	8	13	—	—	1	7
Days of	15	10	6	7	1	—	1	2	11	15	5	12	—	—	2	3	4	18	6	13	—	—	—	5

TABLE IX. (*concluded*).

WEATHER NOTATIONS AT GRIFFITH ISLAND, 1850 September 12th, to 1851 August 10th.—*concluded*.

Hours.	March, 1851.								April, 1851.								May, 1851.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
1 a.m.	5	17	9	17	—	—	1	8	2	15	13	12	—	—	3	3	—	15	16	18	—	—	4	1
3 „	4	18	9	17	—	—	1	8	1	16	13	12	—	—	7	3	1	14	16	21	—	—	5	—
5 „	9	13	9	18	—	—	1	6	7	11	12	17	—	—	8	4	2	12	17	19	—	—	5	1
7 „	7	16	8	19	—	—	2	6	8	10	12	18	—	—	9	4	3	12	16	16	—	—	4	—
9 „	5	17	9	19	—	—	2	3	2	19	9	19	—	—	5	5	4	13	14	23	—	—	8	—
11 „	7	16	8	18	—	—	1	5	3	18	9	18	—	—	4	4	2	14	15	22	—	1	4	—
1 p.m.	8	17	6	18	—	—	1	5	4	14	12	14	—	—	5	5	3	13	15	20	—	1	4	—
3 „	9	16	6	18	—	—	—	4	5	11	14	15	—	—	6	5	1	16	14	21	—	1	3	—
5 „	5	19	7	15	—	—	3	5	5	14	11	9	—	—	6	4	4	14	13	16	—	—	7	—
7 „	7	16	8	15	—	—	2	5	3	18	9	11	—	—	4	4	4	12	15	17	—	—	7	—
9 „	8	13	10	14	—	—	2	5	3	18	9	10	—	—	6	4	5	11	15	18	—	—	5	—
11 „	7	15	9	14	—	—	2	7	6	14	10	10	—	—	5	4	6	12	13	12	—	—	6	—
Day of	7	16	8	17	—	—	2	6	4	15	11	14	—	—	6	4	3	13	15	19	—	—	5	—

(*continued*).

Hours.	June, 1851.								July, 1851.								August, 1851.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
1 a.m.	3	7	20	9	1	—	2	1	6	10	15	2	7	1	2	1	1	3	6	1	3	—	4	1
3 „	3	6	21	9	1	—	2	1	6	9	16	3	5	5	1	—	1	2	7	2	3	—	4	1
5 „	4	8	18	4	1	—	5	—	6	10	15	3	5	3	—	1	1	2	7	1	3	—	4	—
7 „	4	8	18	8	1	—	5	1	5	10	16	5	6	2	—	1	1	2	7	2	3	—	3	—
9 „	4	8	18	8	—	1	8	1	5	14	12	5	3	4	—	—	2	3	5	2	3	1	—	—
11 „	5	7	18	7	—	3	9	1	5	15	11	5	4	2	1	—	2	4	4	1	3	—	—	—
1 p.m.	7	10	13	9	—	1	6	2	7	14	10	4	3	1	—	2	2	5	3	2	1	—	—	—
3 „	8	10	12	7	—	1	5	2	7	11	13	5	3	1	—	2	2	5	3	2	1	—	—	—
5 „	8	10	12	7	—	1	3	1	7	13	11	5	4	3	—	1	3	4	3	1	—	1	1	2
7 „	7	11	12	5	—	1	5	—	7	11	13	6	3	4	1	2	2	3	5	2	1	1	2	1
9 „	6	8	16	8	—	1	3	—	4	10	17	6	3	2	1	—	2	3	5	2	4	—	1	1
11 „	5	8	17	9	—	2	1	1	5	10	16	7	4	2	2	—	2	1	7	2	4	—	1	1
Days of	5	9	16	8	—	1	5	1	6	11	14	5	4	3	1	1	2	3	5	2	2	—	2	1

NOTES from the METEOROLOGICAL REGISTER and the LOG-BOOK of H.M.S. "RESOLUTE."

1850.—SEPTEMBER.

12th - - Moored to the main floe in Barrow Strait, near Griffith Island.
13th - - Standing along the edge of the floe.
13th, 5 p.m. - Secured to the land ice, between Griffith Island aand Cape Martyr.
14th, 11 a.m. - Refraction very strong.
17th, 1 p.m. - Started a balloon which took a N.N.W. (true) course.
18th, 5 p.m. - Moored to the floe between Cornwallis and Griffith Islands.
20th, 3 p.m. - Started three balloons, which took to S.W.
21st, 1 p.m. - Started a balloon, which proceeded in a N.W. direction as long as in sight. No water to be seen from Crow's Nest.
27th, 1 a.m. - A lane of water extending from the south end of Griffith Island towards Cornwallis Island for about 2 miles.
29th, 1 a.m. - Moon surrounded by halo of large radius.

OCTOBER.

1st - - Measured the bay ice formed in canal since 25th ult., and found it to be 9 inches thick.
3rd, 9 p.m. - A streak of aurora of a pale straw colour seen to the N.W. shooting in a perpendicular direction toward the zenith, reaching an altitude of 40°.
5th, 7 a.m. - Halo round the Sun with parhelia.
8th, 1 a.m. - Several vertical streaks of aurora.
8th, 1 p.m. - Several vertical streaks of aurora.
9th, 9 a.m. - Started a balloon and three pilot balloons, which took a W.N.W. direction.
11th, 7 a.m. - Two horizontal parhelia round the Sun.
12th - - The ship is frozen in at the east edge of the floe and enclosed by thick hummocky ice, much squeezed up by the bay ice of this season; this extends to about 300 yards to the eastward, and farther east the newly formed bay ice or floe, and occasional pieces of old ice frozen in it, extends to the limit of vision.
13th, 9 a.m. - A narrow lane of water has formed, width about 20 yards, and distant from the ship one mile, extending from the south shore of Griffith Island a considerable distance towards Cape Martyr.
14th - - Building a thermometer house on the floe.
15th, 1 a.m. - Two small streaks of aurora S.E.
16th, 1 a.m. - A low broken arch of aurora extending S. by W.
16th, 5 p.m. - Aurora S.W. to N.
17th, 1 a.m. - A few pale pencils of aurora to S.
22nd, 7 a.m. - A prismatic parhelion.
28th, 11 a.m. - Sent off a balloon. which took a N.W. direction.
29th, 9.20 to 11 p.m. Aurora.

NOVEMBER.

1st, 7 a.m. - Parhelia on each side of the Sun.
1st, 11 p.m. - A few streaks of aurora.
3rd, 1 a.m. - Three patches of pale aurora.
6th, 3 p.m. - Sent off a balloon which took a W.N.W. direction.
7th - - The Sun having attained declination $16\frac{1}{4}°$ S., his upper limb, making due allowance for refraction, will not reach the $74\frac{1}{2}$ parallel of latitude where we are now stationed.

8th, 3 p.m. - A bright arch of aurora from S.E. extending over the zenith to about N.N.W., through which the stars could be seen.
9 p.m. - A thin transparent pillar of aurora visible.
13th, 1 a.m. - A few streaks of aurora visible towards the zenith.
13th, 5 a.m. - A few very faint beams of aurora near the S.E. horizon.
14th, 5 a.m. - Arched coruscations of aurora Sd.
30th, 9 p.m. - A few pencils of aurora to the N.

DECEMBER.

1st, 4 a.m. - A pale sheet of aurora visible for a short time to the S.W.
1st, 8.30 p.m. - An arch of brilliant aurora extending from S.E. to N.W. horizon, vanished at 9.30 p.m.
2nd, 1 a.m. - A few streaks of aurora.
4th, 9 p.m. - A few streaks of aurora visible in the S.W.
6th, 5 p.m. - A number of pencils of aurora extending from S. to W.S.W.
7th, 7 p.m. - A few flashes of aurora to the S. W. occasionally.
8th, 7.50 a.m. - A very fine large meteor shot from Majoris in an E.S.E. direction. A few faint streaks of aurora to the W. At 7 a.m., a beautiful aurora shot up from S.E. At 5 p.m., a few faint pencils of aurora in S.W. At midnight, aurora to S.W.
9th, 1 a.m. - Faint aurora to S.E.
9th, 9 p.m. - Several vertical streaks of aurora shooting up towards the zenith.
10th, 1 a.m. - A few faint flashes of aurora in S.W.
11th, 5 a.m. - A few pencils of aurora shooting from W. to S.S.E.
11th, 5 p.m. - A few faint streaks of aurora.
12th - A crack of about 3 inches in width and considerable length was observed in the last formed ice about half a mile astern of the ship, extending in an easterly direction towards Cornwallis Island.
20th, 9 a.m. - Two paraselenæ.
21st, 11.30 a.m. - Daylight sufficient to read moderate size print with difficulty.
27th, 5 p.m. - A few vivid coruscations of aurora to S.E.
28th, 1 a.m. - Several bright streaks of aurora shooting up from S.W. horizon.
30th, 3 a.m. - Some very faint pencils of aurora emanating from S.W.
30th, 5 p.m. - A few faint pencils of aurora shooting from S.
31st, 5 a.m. - A few crystals of mercury at edge of a vial, containing a large quantity of mercury. At 7, about two-thirds of the exposed mercury became solid, the centre portion remaining fluid; thermometer in air —39·5.

1851.—JANUARY.

4th, 5 a.m. - Several beautiful streaks and flashes of aurora of great size extending above each other from S. to the zenith.
4th, 11.40 a.m. A small meteor, near the zenith, shooting N.W.
9th, 7 a.m. - A few faint pencils of aurora to S.W.
10th, 5 p.m. - A pale halo round the Moon.
17th - The thermometer house having filled up with drift, the instruments were shifted to another position a few yards to S.S.W.
20th, 3 p.m. - Moderately bright aurora extending length of Griffith Island.
24th, 1 a.m. - A brilliant arch of aurora bearing westward at an altitude of about 25°.
26th, 7 a.m. - Several bright streaks of aurora to N.W.
26th, 7.30 a.m. - Observed a meteor bearing W. to shoot from an altitude of 30° to 40°.
26th, 3 p.m. - A brilliant aurora. Observed a meteor.
27th, 1 a.m. - Bright emanations of aurora from S.
27th, 5 a.m. - Aurora from S.
28th, 10.30 a.m. An extensive arch of aurora to N.W.

FEBRUARY.

2nd, 1 a.m. - A streak of aurora from S.E. to N.W.
2nd, 5 p.m. - A few bright streaks of aurora.
3rd - Thickness of ice, as measured this day, old floe 4 feet 6 inches, new floe 4 feet 1 inch.
3rd, 10.50 p.m. A very bright streak of aurora from S.E. to N.W.
18th, 1 a.m. - A halo round the Moon.
18th, 2.25 p.m. - A parhelion.
19th, 1 p.m. - A halo round the Sun.
20th, 9 a.m. - A halo round the Sun.
20th, 1 p.m. - A parhelion each side of the Sun.
21st, 7 a.m. - A parhelion east of Sun.
23rd, 5 p.m. - A pale but extensive sheet of aurora to W.N.W.
24th, 5 a.m. - A faint aurora.
24th, 9 p.m. - A bright sheet of aurora from W. to S.
26th, 11 p.m. - A pale streak of aurora.

MARCH.

3rd, 5 a.m. - Temperature on floe —27°, on deck under housing —29°, on deck abaft —27°·7; by Pastorelli 19, 485, 23 respectively. Thickness of ice, old floe 4 feet 6 inches, new floe 4 feet 11 inches.
5th, 8.50 a.m. - A meteor. At 9, several flashes of aurora.
8th, 9 a.m. - Distant land very much refracted.
10th, 5 p.m. - Distant land much refracted.
11th, 10 a.m. - A parhelion.
12th, 6.40 a.m. - Three parhelia.
12th, 8.50 p.m. - A faint halo round the Moon.
13th, 1 a.m. - A halo round the Moon.
14th, 2.15 p.m. - Wind fell suddenly, S.E. 6 to 2.
17th, Noon - Distant land very much refracted.
18th, 2 p.m. - Two parhelia.
23rd, 5 p.m. - Two parhelia.
26th, 10.30 p.m. A faint patch of aurora near the zenith.
27th, 7 a.m. - Distant land very much refracted.
31st, 5 p.m. - A parhelion.

APRIL.

1st, 8 p.m. - A parhelion.
8th - Crack in the ice under the stern opened about $1\frac{1}{2}$ inch in a line with the keel, the ship having a slight inclination to starboard.
13th - A snow bunting alighted close alongside the ship.
19th, 5.10 a.m. - Wind died away suddenly, S.S.W. 5 to calm.
21st, 8.40 p.m. - Faint parhelia.
22nd, 9 a.m. - Faint parhelia.
28th, 7 a.m. - Distant land very much refracted.

MAY.

3rd - Measured the thickness of the ice of this season, which proved to be 6 feet 2 inches, having increased 8 inches during the month of April.
6th - Measured the ice of previous season, 6 feet.

11th, Noon - Water had made on a black surface having a S.W. aspect.
15th, Noon - Thermometer in sun 40°, shade 23°.
17th, 7 a.m. - Distant land much refracted. At 10, sent off a balloon which ascended almost perpendicularly.
23rd - - Ship relieved herself from the ice, rising 1 foot forward.
30th - - One of the gull species seen.

JUNE.

2nd - - A large flock of ducks flying N.
5th - - An ivory gull shot from the ship.
7th - - A phalarope and a boatswain's bird shot on Griffith Island.
9th - - A hare and brace of ptarmigans shot on Griffith Island. Water appears to be rapidly making on the ice.
10th, 1 p.m. - Temperature in sun 61°, shade 41°.
10th, 3 p.m. - " " 55° " 36°.
10th - - A balloon was sent off which took a N.N.E. direction.
11th, 1 p.m. - Temperature in sun 61°, shade 39°.
11th, 3 p.m. - " " 78°, " 41°.
12th, Noon - " " 49°, " 34°.
13th - - Increase of temperature with humid weather has caused streams to run inshore.
17th, 9 a.m. - Temperature in sun 40°, shade 39°.
17th, 1 p.m. - " " 43°, " 36°.
18th - - A large flock of eider ducks flew past to N.W. A pair of brent geese seen, and a few looms. Several pools of water forming on the floe.
22nd - - Surface of snow thawing freely.
23rd - - Cut a hole through the floe to allow the water to run off; thickness about 9 feet.
24th, Noon - Temperature in sun 44°, shade 34°.
24th, 1 p.m. - " " 41°, " 34°.
25th - - Original floe very spongy, 7 feet 9½ inches thick. New floe astern of ship 6 feet 3 inches thick. New floe in canal close to stern 6 feet 6 inches thick.
26th, 1 p.m. - Temperature in sun 36°·5, shade 35°.
30th, Noon - " " 45° " 38°.
30th, 1 p.m. - " " 39° " 36°.
Ducks were seen on several days, a rotge on 17th. One bear was killed.

JULY.

1st, - - Large disruption of the ice to the S.E. of Griffith Island, apparently occasioned by the springs of June 29th.
1st, Noon - Temperature in sun 40°, shade 38°·5.
2nd, Noon - " " 76°, " 53°·3.
2nd, 1 p.m. - " " 64°, " 50°·5.
3rd, Noon - " " 44°, " 41°.
3rd, 1 p.m. - " " 47°, " 45°.
4th, 7 a.m. - Land about Cape Bunney much refracted.
5th, 11 a.m. - Temperature in sun 45°, shade 44°·5.
6th, Noon - " " 57°, " 57°.
6th, 1 p.m. - " " 59°, " 53°.
The pack was observed to be in motion from the masthead. Found streams of ice extending from the S.E. of Griffith Island to about 4 miles in the direction of Cape Hotham.
8th, 11 a.m. - Temperature in sun 40°, in shade 39°·5.

8th, 1 p.m. - Temperature in sun 42°·5, shade 38°·5.
8th, 7 p.m. - A rainbow in S.E.
9th, 11 a.m. - Temperature in sun 45°, in shade 36°.
11th, Noon - " " 37°, " 35°·5.
11th, 1 p.m. - " " 40°, " 35°·5.
12th, 1 p.m. - " " 39°, " 35°·5.
13th, Noon - " " 37°, " 35°·5.
14th - - A crack in the ice astern of the ship, said to be about 3 miles distant, about 60 feet in breadth, extending from S.E. of Griffith Island to E. of Cape Martyr.
16th, Noon - Temperature in sun 48°, in shade 44°.
19th - - Water from south point of Griffith Island to Cornwallis Island, the nearest edge 2¼ miles from the ship.
19th, Noon - Temperature in sun 51°·5, in shade 43°·5.
22nd, Noon - " " 64°, " 42°·5.
23rd, 11 a.m. - " " 45°, " 33°.
24th, 11 a.m. - " " 47°, " 42°.
28th - - The ice to N.W. closed in upon the fixed ice and caused a little pressure near the ship, and caused the canal which had been cut to close.
30th - - Water has extended past the ships to the S., along the shore of Griffith Island. Outer edge of ice to the N.W. about 1½ miles off, that to the S.E. about 3 miles.
31st, 1 p.m. - Ice about the ship moving.

AUGUST.

2nd - - The ice wholly broken up between the vessels and Griffith Island, along its eastern side from the N. and W. extremes within 3 miles of S.E. point.
3rd to 9th - Ship between Cape Martyr and Griffith Island.
3rd - - Water extending to the N.W. as far as the eye could reach from the Crow's Nest, and to the southward about ½ mile; loose pack inshore drifting to southward.
4th - - Saw a large walrus and young.
6th - - A shoal of narwhals in a hole of water.
7th - - Some whales alongside the floe edge. Ice about the ship stationary. Loose ice drifting down in large quantities from N.W. Loose pieces drifting down Barrow Strait from the W. At noon ice inshore of Griffith Island slacked a little. Detached ice to the N.W. streaming off in that direction. No alteration perceptible to S.E.
9th and 10th - Ship between Cornwallis and Griffith Islands.
9th, Noon - The ice to S.E. of Griffith Island in a general state of disruption along shore and packed close home, leaving a barrier of ice a mile broad between the S.E. and N.W. waters. This barrier has also a crack running N.E. and another S.E.

Temperature of the sea surface in—

June	29°·5	from 57	observations.
July	30°·4	" 77	"
August	30°·2	" 29	"

No. X.

Results of Meteorological Observations made at Assistance Bay.

The Government ships "Lady Franklin," Captain W. Penny, and "Sophia," Captain Alex. Stewart, in search of Sir John Franklin's expedition, wintered in 1850–1, at Assistance Bay, in latitude 74° 40′ N., longitude 94° 16′ W.

Dr. P. C. Sutherland, in his account of the cruise of these two vessels, entitled "Journal of a Voyage to Baffin's Bay and Barrow Strait," states that "Assistance Bay is an estuary through which the melting snow on a great portion of Cornwallis Island makes its exit into the sea,"—Vol. I., page 365; and that "at an elevation of from 20 to 30 feet above the level of the sea, and at a distance of a quarter to half a mile from the high-water mark right round the bay, there are a great number of small lakes,"—Vol. I., p. 364.

John Stuart, third mate of the "Lady Franklin," kept a meteorological register which was lent to the Meteorological Office by Captain Penny. Owing to the absence of the observer on sledge journeys and other duties, the register is incomplete. With a view of filling up the gaps as far as possible, the Admiralty log was obtained from the Record Office. It was kept by John Marshall, first mate, and the only meteorological data it affords are those relating to wind and weather.

Nothing is known respecting the barometer, and the observations from it have been corrected for temperature only.

There is in the Meteorological Office a red-spirit thermometer on a boxwood scale by Pastorelli, N. 23, on the back of which is written "This thermometer together " with another and an aneroid Z 55, were returned by Captain Penny 1851, October." This instrument, in July 1876, was verified at the Kew Observatory, when its corrections were found to be as follows: at −38°,−0·7; at 12°, +0·5; at 22°, +0·5; at 32°, + 0·4; at 42°, + 0·5; at 52°, + 0·3. It thus appears that this is a very accurate thermometer, but whether or not the recorded observations were made with it cannot be ascertained. No correction whatever has been applied to the thermometrical observations.

The winds for September have been corrected for 12 points westerly variation of the compass; during the rest of the period spent in winter quarters the true direction of the wind seems to have been recorded.

Table I. contains the means of the barometrical observations reduced to 32°, and the mean temperature of the air on the floe. A thermometer was also observed on board, but as it averaged 8°·6 higher in November, and 21°·5 higher in January, than the one on the floe, the results from it are not given here; they evidently show the effect of artificial heat.

Table II. exhibits the relation between the extreme readings of the barometer in each month, and the accompanying winds and weather. The highest occurred with a light air from N.N.E., the lowest with a strong S.E. wind.

Table III. exhibits the relation between the extreme temperatures of each month, and the accompanying winds and weather. The highest temperature occurred with a light N.W. wind, the lowest with a gale from N.N.E.

Table IV. gives the sums of force of the wind components in each month for the hours specified.

Table V. contains monthly summaries of the winds, showing their distribution around the compass, their prevalence and relative strength.

Table VI. contains summaries of the weather notations in each month for the hours specified.

As regards Tables IV., V., and VI., it will be seen that the months are arranged so as to suit the symmetry of printing. This is occasioned by the circumstance that the winds and weather of November, December, and January have been discussed in connection with the barometrical and thermometrical observations made in those months. During the rest of the period no instrumental observations were recorded, and it was not considered advisable to discuss the winds and weather more minutely than for eight-hourly intervals, or three observations per day.

Table VII. and VIII. have been compiled from the abstract of the Meteorological Journal kept on board H.M.S. "Sophia," as printed in the appendix to Dr. Sutherland's work above referred to.

Table VII. contains the three-hourly results of the temperatures of the air on the floe during the period 1850, September 1st, to 1851, August 13th. These means have been recomputed from the observations as printed, and will be found to differ from the printed results.

Table VIII. gives the extremes of temperature, with the winds and weather of the same days.

The coldest weather seems to be associated with N.W.ly. winds, the warmest with S.E.ly. The monthly range of temperature was 65° in April, 21° in July; the absolute maximum was 50° in July, the absolute minimum was − 45° in February, giving a range of 95° for the year.

Although the observations are only for the first 13 days of August, the results fall in with the curve of temperature very well. Adopting them as the mean for the month, the mean temperature of the year was 2°·5.

The mean temperature of the sea from continuous observations in September was 29°·1. Afterwards the temperature of the sea was only observed occasionally, and Dr. Sutherland remarks in his Journal, under date November 30th, "The temperature of the sea water could not be ascertained with anything like precision, owing to the defective state of our thermometers, which ought to have been such as would indicate

within half or a quarter of a degree of Fahrenheit's scale. Some of them were ascertained by means of the freezing point of water, with the barometer at 30 inches, to have errors of two or three degrees; and none could be read to a lower division than half a degree. Ever since the harbour became frozen over, we found the temperature to be about 29°·5 or 30°. Before this took place, we found it so low as 28°; but that was generally when it was in a state of agitation by the winds, the temperature of which was considerably below + 28°. This is easily accounted for by the saline portion being kept in a state of intimate admixture with the water by agitation, after the former began to be precipitated by refrigeration."—Vol. I., p. 442.

The quotations which follow are all taken from Sutherland's Journal:—

September.—The weather was cloudy with frequent snow showers. The most air arrived from the N.W., though the wind blew more or less from all directions. The soil was frozen hard everywhere. "It is difficult to ascertain the exact depth to which it becomes thawed during the summer months; there is no doubt it must vary according to the exposure and the declivity. In southerly exposed parts there may be a depth of several feet of the thawed soil; whereas, when the exposure is northerly, it may not be as many inches. Where the mean temperature throughout the year is so far below the freezing point of water, the soil must also be cooled down to a depth far below the surface, before the heat from the interior of the earth can overcome the cold which is conducted from the atmosphere."—Vol. I., p. 396.

October.—The weather was changeable, with long continued and dense falls of snow. The winds were from all directions except S.W., though the most frequently from N. The mean maximum temperature appears to have occurred about 9 p.m., and Dr. Sutherland makes the following remark bearing upon this point:—"We often found that, even at a late hour in the evening, when the sun was below the horizon, the indications of the thermometer were higher if the atmosphere were thick with clouds, than at noon, if the sky were clear and cloudless."—Vol. I., p. 391.

"During the whole of the month of October, the sun was very frequently attended by the most beautiful and brilliant parhelia, and parhelic circles, which were, for the most part, prismatic at first, but were always becoming less so as the meridian altitude decreased. At noon this was remarkably well seen, for the mock suns were so bright, and of the same yellow colour as the sun, that it was very difficult to make any distinctions between them. Where the sun itself was there appeared to be two suns, placed the one above the other, not vertically, but at an angle of 45°, and a little more than one diameter apart. The temperature of the air always varied according to the state of the weather, with respect to cloudy or clear, and the direction and force of the winds. The minimum for the season was −18° during a north-easterly breeze and clear weather, and the maximum for October was +18° during a S.E. wind and thick weather,"—Vol. I., p. 419.

November.—The weather was mostly overcast and misty, the nights being clearer than the days. There were winds from all directions, but most frequently from E.S.E., and hanging in the N.N.W. to N.E. arc of the horizon. "On the 9th, 10th and 11th, we had a violent snowstorm, which came on very suddenly from south-east; the barometer had been falling with a light northerly breeze, with clear weather and almost a cloudless sky, for 24 hours previously, the temperature ranging from −17° to −10°. On the previous night, between the hours of 7 p.m. and midnight, there was an appearance on the southern horizon which a little resembled aurora borealis, and illuminated the snow beneath it. It commenced about S.E. and moved imperceptibly to S.W., where it disappeared about or soon after midnight . . . . . Immediately before the gale came on, the wind was from N., and the temperature −17°. In less than 10 minutes there was an eight-knot breeze, and the temperature was up to 10°. The change was so sudden, that the funnels through which the smoke had to escape had not time to accommodate themselves to the new and opposite direction which the wind assumed; the result was, that our cabins instantly filled with smoke, and the alarm of fire was given; but this alarm was soon put down, and the smoke escaped by its proper passage as soon as the wind-skews of the funnels were shifted to the weather side. In the same the barometer fell nearly $\frac{1}{10}$th of an inch; and after 30 hours of an incessant gale, which the number 11 might represent with regard to force, accompanied by snow, when the first sign of amendment took place it had risen but $\frac{1}{200}$th of an inch, having fallen from 29·75 to 29·345; and the temperature increased gradually from −17° to +8°. It continued 15 hours longer. In this time the thermometer rose to +13°, and the barometer to 29·45, after which, having abated to a force represented by 3, it veered round to N.W., and blew violently for upwards of 24 hours longer. In this time the temperature fell to −17°, and the barometer rose to 29·90, and clear weather was established as the wind fell. The snow, which had fallen and accumulated into wreaths during the S.E. part of the gale, was removed almost entirely; and if persons happened to have been walking over them in any part, the footmarks which had been left by sinking deep in the soft snow remained raised distinctly above the surface of the original snow on which the recent wreaths had formed."—Vol. I., p. 433. On the 23rd, in the evening, there was a paraselena. "The sky was almost perfectly cloudless at the time, the only exception to this being a thin mist or cloudy film, which was drifting on the horizon and the north-western sky, before a gentle northerly breeze."

"During a northerly wind and a clear sky on the first day of this month, the temperature fell to −17°. The maximum, +13°, was on the 11th, during a strong S.E. gale, accompanied by thick snow. The minimum, −24°, was on the 30th, during a northerly wind and clear weather. The lowest temperatures always occurred during northerly winds and clear weather. The winds were now prevailing from about N. or N.N.W., although occasionally there were smart breezes from the southward, accompanied by dense falls of snow. The floe in the harbour was upwards of 3 feet thick."—Vol. I., p. 438.

December.—The weather was clear and cloudy. The prevalent wind was N.N.W.; there were no south-easterly winds.

"The atmosphere was every day becoming sensibly clearer and freer from vapour. During the absence of the Moon the nights exhibited that dark appearance of the sky towards the zenith which is so common in the arctic regions, and which is owing to the absence of vapour, and a rarified condition of the atmosphere."—Vol. I., p. 439.

"We always found that at noon the thermometer in the open air could be read off quite correctly with the light which the southern horizon afforded."—Vol. I., p. 445.

"The weather was very favourable on most occasions for recreation in the open air, and for excursions to the land around the bay and to the offing, where even yet a large lane of open water was seen along the land ice on which we were walking, except when the pack ice came in with the tide, or with a southerly wind, in which case it was transferred to the opposite side of Barrow Strait. We could see vapour ascending like columns of smoke from all parts of Barrow Strait; this could only take place from the exposed surface of sea water, and there is no doubt the exposure which might be necessary was effected by the whole pack shifting about under the influence of wind and tide, during the whole winter. . . . . The result of sea water being exposed at the air at such low temperatures as −20° to −30°, was invariably the ascent of heated air and vapour which distorted in a remarkable manner the land on the S. shore of Barrow Strait and Griffith Island to the westward.

"The aurora borealis was frequently observed, but the extent and brilliancy of this beautiful meteoric phenomenon never equalled what had been seen in September and October, while crossing the Atlantic in the latitude of Cape Farewell. The black appearance of the sky towards the zenith at midnight was every day becoming more apparent, and the stars sparkled like diamonds upon it; but hitherto it did not approach the limits of the blackness under similar circumstances described by Sir John Ross in his voyage in the "Victory." The lowest temperature entered in the register was −37°, and it happened on the 1st and 30th; the maximum was −4° at noon of the 22nd, being the shortest day. With the minimum temperatures the wind was northerly and the sky clear, and with the maximum it was southerly and the sky densely overcast. The wind frequently varied much in force when it was northerly, but the variations never assumed the character of squalls, for from a force represented by 2, puffs of piercing coldness swept across in a minute, with a velocity three or four times faster than that which had been before or after it; and if one happened to be in its track, the hands had to be instantly applied to the face to prevent frost-bite."—Vol. I., p. 448.

January.—The weather was clear for the most part, with N.N.W. winds; no winds from the S.E. quarter.

"Up to this time, 13th, the temperature had not been sufficiently low to freeze mercury, but now it was down to −39° by Pastorelli's spirit of wine thermometer, and the mercury was as solid as a leaden bullet."—Vol. I., p. 451.

"The temperature of the water was always the same; or, if there was any difference, our ordinary instruments were not sufficiently nice in their graduation to detect it.

"On the 25th and 26th there was a violent gale from N. and N.E., accompanied by a good deal of snow, which drifted along the horizon with great violence. The barometer began to rise with a northerly wind 24 hours before the gale came on, and during the violence of the gale it rose from 29·80 to 30·07. At first the temperature was about −30°; in about 18 hours it rose to −15°; and at the termination of the gale it fell to −23°, the wind being N.N.W., N.N.E., and N. respectively. On the 27th, the gale abated, and as the floe was free from drift, there were inducements to make excursions over it to the land at the S.E. and S.W. points of the harbour, and also to the offing. On the return of the parties who had been thus distributed, open water to the extent of two or three miles in breadth was reported, stretching from E. to W. along the south shore of Cornwallis Island, and also in the direction of Griffith Island. The whole pack in Barrow Strait had shifted over to the opposite side of the Strait, and hence such a large space of open water on this side. It was really beautiful to behold an extensive sheet of blue water on the 31st day of the cold month of January in those dreary and icy regions, where we were led to believe that in the depths of winter everything would be firmly clasped under the powerful influence of intense cold.

"The sky, during the hours of daylight, which by this time were lengthening out very plainly, was frequently spread over with fleecy clouds, and at night the aurora, of a beautiful golden colour, danced from E. to W. in vivid coruscations, and enlivened our midnight scenes, although, as has been remarked already, they were much less vivid than in the more southern latitudes. The temperature varied with us much less than it did with Sir W. Edward Parry at Melville Island in 1820. The maximum was −10° on the 10th, and during a southerly wind and an overcast sky, the minimum was −41° on the 21st, during long-continued northerly winds and very clear weather."—Vol. I., p. 456.

February.—The weather was mostly overcast. The prevalent wind was N.N.E. There were no winds from S.W.

"On the 15th, about the time of full and change, a violent gale came on from the S.E., with the atmospheric pressure decreasing, and a high state of the thermometer. The sky was overcast, and the snow drifted constantly and with great violence."—Vol. I., p. 467.

"For a day or two after the storm the weather was very pleasant, the sky was generally very clear, and fleecy and stratified clouds were spread over it. There were halos around the Moon during the night, and beautiful parhelic circles, rich in the four prismatic colours, around the Sun during the day, which added a charm to everything we beheld."—Vol. I., p. 469.

On the 24th, "the weather was remarkably fine; there was little or no wind, and the temperature was −41°. The mercury, which we always kept exposed in a broken tumbler, had been frozen for nearly three successive days. Freely exposed to the Sun's rays, the thermometer generally rose 10° above the shade if the weather was clear."—Vol. I., p. 473.

"The maximum temperature for the month was −10°, after a south-easterly wind had prevailed for two or three days, and the minimum was −45° during clear and almost perfectly calm weather."—Vol. I., p. 476.

"At an early hour of the 28th the sky became overcast, and the wind, which was northerly, veered to the eastward a few points. The temperature, which the previous night had been down to −43°, rose at first to −37°, but at this temperature the mercury in the tumbler did not thaw, owing probably to the thickness of the glass, and its non-conducting property. Very soon after 3 a.m. the temperature rose above −37°, and then the mercury thawed, having begun to soften first on the upper surface. Yesterday, in the evening, there were most beautiful parhelic circles, of the richest prismatic tints, on the western sky. They were present during the greater part of the day, but, as evening approached, nothing that I had ever seen of the same kind equalled them. Their radii were 22° 47′ and 45°, and they were disposed vertically and horizontally to the Sun. The exposed thermometer, at right angles with the rays, rose to −3°, while in the shade it was −34°. At noon to-day the wind had increased to a strong gale from E.N.E., and there was a constant whirling about of immense volumes of drifting snow. Towards evening the snow, still thickening in the wind, became a little squally, the squalls resembling those already alluded to, both with respect to coldness and violence."—Vol. I., p. 493.

March.—The weather was generally clear and squally with northerly winds. There were no S.W. winds.

"At noon, on the 6th, the Sun's rays received on the ball of the thermometer were only −23°, while the shade was −28°."

On the 8th, "the sky was very clear and perfectly cloudless, and there was very little wind; it increased, however, from the northward towards evening. The rays raised the thermometer to −2° from −35°, at which it happened to be in the shade. —Vol. I., p. 500.

"9th, the weather was every day becoming clear and more pleasant, although the cold was generally intense. Last night the mercury became frozen, and continued in that state for nearly 12 hours. The lowest temperature that was observed was −36°; probably the circumstance that the same quantity of mercury having been frozen frequently on previous occasions may account for the readiness with which it now assumed the solid form. It was to be regretted that we had not a self-registering thermometer; for it is not unlikely that the temperature was two or three degrees lower than had been read off: in this case the mercury would have become solid at once by the escape of heat, and the thickness of the glass tumbler would for a considerable time retain the cold. At noon the shade was −30°, and the exposed instrument was −2°; at 1 p.m. the shade was −31°, and the exposed +2°. This was the greatest difference that had hitherto been observed between the shaded and exposed instruments; and it was also the first time that the thermometer had been above zero this season, even in the Sun's rays. On the surface of the floe, where there were gentle slopes to the southward, the surface of the snow had become a little glazed, from a very thin film of the snow melting, and again freezing almost instantly. It did not appear to have begun to thaw on the land, or even against the black paint of the ship's side; from this fact we could hardly question the correctness of the indications of the exposed thermometer, although at the same time it was extremely difficult to account for the glazed appearance of the snow already noticed, an appearance which at once conveyed an idea that the temperature had been above the freezing point of water."—Vol. I., p. 505.

"On the 21st and 22nd we experienced one of the most violent storms of the season. At 3 a.m., and since midnight of the 21st, there was a remarkably white appearance on the northern and north-eastern horizon over the land. Before 6 a.m. of the same day the gale commenced, the sky was overcast, and the snow fell fast, and, drifting into dense volumes which obscured objects even close at hand, it accumulated into dense wreaths which threatened to overwhelm our ships. At 2 p.m., the gale was at its acme, and then the thermometer was down to −42°, and the barometer was at 30·17. The wind veered at that time from N.W. to N.N.W., and the barometer continued to rise steadily. There was a temporary lull at 7 p.m., when the wind veered again to N.W. On the following day, the 22nd, the gale moderated a little, and the temperature was up to −19°."—Vol. II., p. 17.

"There were brilliant parhelia and parhelic circles almost every day; and now the Sun's rays had acquired sufficient power to melt snow on stones on the land, and on the black painted bulwarks of the ships, although in the shade the thermometer was −23° to −28°."—Vol. II., p. 24.

"The maximum and minimum temperatures for the month were −4° and −41°·7 on the 30th and 21st; and on the 28th the Sun's rays received on Pastorelli's spirit of wine thermometer, raised it to +40°, while the air in the shade was −16°. We had numerous proofs that snow and shingle, with a southern slope, became heated considerably above the temperature of the ambient atmosphere in clear sunshine and calm weather."—Vol. II., p. 26.

April.—The weather was changeable, snowy, with variable winds, including southerly and south-easterly.

"The temperature of the water had not varied for four months, except, perhaps, half a degree: and now it was 29°·25."—Vol. II., p. 29.

"The winds during this month prevailed chiefly from the northward; but there were frequently smart gales from S.E. and S. The weather was generally clear with the former, and the temperature was low; but, with the latter, the weather was almost invariably dull and gloomy, and the temperature was comparatively high. The minimum was −31°, and the maximum +34°. On the 21st, the change was rather sudden; for in less than 12 hours the thermometer came down from +5° to −25°." —Vol. II., p. 63.

May.—The weather was overcast and snowy. The prevalent winds were N.N.W., though the resultant winds came out W.

June.—The weather was mostly overcast, with snow. The first rain for the season fell on 12th. The winds were mostly W.S.W.

July.—The weather was overcast, with clear intervals, and frequent rain and snow. The winds were mostly W.S.W. and S.E.; very little northerly.

"The weather was generally pleasant, although it was often rainy and cloudy, when the wind prevailed from the eastward. Since the middle of June mists were very common, and we rarely had 24 hours of uninterrupted clear weather."—Vol. II., p. 201.

August.—The weather was overcast and snowy, with variable winds.

"About the end of May and the first week of June, the weather changed in a remarkable manner. Instead of the keen bracing atmosphere, the clear blue sky, and the northerly winds generally accompanied by low temperatures, there was a densely overcast sky, the clouds were heavy, gloomy, and portentous, and the winds prevailed from the southward, accompanied by a constant falling of soft snow, and comparatively high temperatures. On the 6th of June, I was in latitude 75° 15′ in the Wellington Channel; the mean temperature for 24 hours was +32°·25, being the first time that it had been about or above the freezing point of water this season. There was a strong south-easterly gale, accompanied by constant precipitation of soft, thick, and flaky snow. Snow began to melt, for the first time, on the canvas of our tent; and foreign substances, such as bits of rope, tins, &c., sunk into the snow on the floe during an overcast sky. At this time birds, brent-geese, and a species of plover were observed, for the first time, to have migrated so far north; but ptarmigan and sea-fowl were seen at a much earlier period on the same side of the channel. On the 7th, at President Bay, water was observed on the land for the first time during cloudy weather, but frequently before then the snow on the stones of the beaches and hill-tops and sides which sloped southward could be seen melting in the bright sunshine, when there happened to be but a very thin coating of it; however, it always froze again, and could be found on the surface of the stones in fragments partly ice and partly snow. So early as the 14th of May, at a height of upwards of 400 feet on a southern slope in the neighbourhood of Cape Grinnell, I observed the snow melting on the surface of a tuft of the purple saxifrage, which fully exposed to the vivifying influence of the Sun in such a highly favoured spot, seemed disposed to put forth its stunted green leaves in acceptance of such a warm invitation. On the 9th of June, the floe in the Wellington Channel, which had formed during the previous winter, presented blue spots, owing to the snow on its surface melting; but the snow on old floes still resisted the increase of temperature, and they retained their white appearance until a later period. At this time thousands of eider, and king ducks were observed migrating up the Wellington Channel; but the tracks of neither deer, hares, nor musk oxen were seen on the floe, although those animals, except the latter, had been seen ever since the middle of May on the land to the northward of latitude 75°. On the 11th and 12th of June, on the west side of the same channel, the maximum temperature for

the season, in the shade, was registered at noon in latitude 75°, during calm and mild weather, and a perfectly cloudless sky. I feared, however, that +55° in the shade was more than the latitude could produce; the instrument was secured from the influence of solar and local radiation as much as was possible under the circumstances, but to protect it from the latter was utterly impossible, for the small stones all along the beach were quite dry and actually warm to the touch; the almost perpendicular cliffs above were particularly favourable to irregular distribution of heat. On board the ships in Assistance Bay, at the same hours, the temperature was +40° and +49°. The air felt so warm at this time that the men took their blanket bags out of the tent, and slept basking in the sun, or in the shade of the tent, for some of them complained of the heat as being oppressive, which it really was. In the tent at the ridge rope the thermometer was +18° or above it. On the 4th of the same month, the minimum, +10°, was registered during clear weather and a gentle breeze off the land, which was within two miles of our position in latitude 75° 35′. On board the ships at the same time it was + 16° during S.E. winds.

"On the 14th of June, the first rain for the season fell at the same time at Cape Hotham, Assistance Harbour, and Cape de Haven; and at Assistance Bay, on the 22nd, small streams began to cut subterranean passages in the snow, and to escape into the sea. However, several days before this time, a large quantity of water had been set free along the west side of the Wellington Channel at the foot of the high land in that quarter, and had made its escape into the sea by cutting channels and passages through the high hummocks which lined the whole coast. So early as the 27th of May a caterpillar was found crawling over mosses and lichens on the south shore of Prince Albert Land in latitude 76° 26′, and the same creatures were, up to the first week in July, to be seen gnawing the green leaves of the *dryas* on the land around Assistance Bay, nearly two degrees further southward. These creatures seem to have had a long summer of it. By the first week of July flies and gnats were on the wing, but some of their larvæ could be seen among confervæ in pools and streams on the land for two or three weeks longer. About the third week in July birds' eggs were found on the land in the vicinity of Assistance Bay, and on Baring Island in Queen Victoria Channel. About the middle of June the ice in the Wellington Channel and in Baring and Prince Alfred Bays became covered with an extensive sheet of water. The same thing was observed in Barrow Strait, but a few days earlier. Towards the last week in June, the ice had released itself of the superincumbent water, this taking place earliest where the ice was of the most recent formation. Where there was old ice, the water continued a much longer time on its surface than on the new or that of one year's growth. As the season advanced and July was pretty well through, large and deep pools appeared on the ice, and not unfrequently a film of young ice formed on their surface during night, and when this happened there was generally in the smaller pools much less water present in the mornings than had been the previous evening. The floe was undergoing rapid decay on its upper surface during the high temperature and bright sunshine in the

daytime, and the water which was the result did not pass through the ice with the same degree of rapidity as it was set free; consequently, the pools filled up during the day, and drained away in the night, especially if it happened to be frosty. This was observed so frequently that no one could be mistaken as to its real cause, and there could be no possibility for setting it down as a rise and fall of the tide upon the ice. I believe, however, that there were some in the searching expeditions who held the opinion that there was a rise and fall of tide on the ice in some parts in the vicinity in the winter quarters of the ships. Rains and easterly winds prevailed to a great extent in July. The maximum temperature was +50°, and the minimum +29°.

"I had a most accurate proof of the modes in which ice forms and decays. During winter and spring I conducted a series of measurements of the ice as it went on increasing in thickness from day to day and from week to week, until the return of summer-heat put a stop to its growth. Through each hole that was made in the ice the thickness was taken, and a piece of spun yarn was passed to the under surface of it, having attached to it a bit of wood which came across the hole the moment its motion in the water became free. To the upper end of the spun yarn, another piece of wood was secured, also across the hole, but at its upper surface and the whole was left in this state throughout the autumn, winter, spring, and summer. Upwards of 60 different marks were laid down in this way in parts of the ice where there were no hummocks nor accumulations of snow. It will be seen from the following table at what rate the increase took place, and the meteorological extracts in the Appendix will give the corresponding temperatures. All the surface markings from September to May could be seen at once, although the increase in that time was not less than 7 feet. This proves beyond a doubt that salt-water ice, as well as that of fresh water, however soft it may be on the surface, increases in thickness from below. One by one the lowermost bits of wood appeared as the floe decayed with the advance of the season; and at the end of this month, those that had been put down when the ice was between 4 and 5 feet thick were on the upper surface. There could not be any doubt here, again, with respect to the mode of decay. The greatest thickness it had attained was 7 feet 9 inches; and of this upwards of 4 feet had already disappeared from the upper surface. The question which was suggested by this result was, where did the water go to that had been set free by the decay of so much ice? There is no way in which it could have escaped except by passing through the ice into the sea. The temperature of it was frequently ascertained, and always found it to be +32°; while the temperature of the sea previous and subsequent to the ice closing together in Barrow Strait in March until, and, I suppose, after the thaw commenced in June on the surface, was not above 29°·5. In still bays, where there is not a rushing tide, the water of the sea doing little more than merely rising and falling, less than a due proportion of fresh, or, I should say, comparatively fresh water, such as melting floes afford mixing at a temperature of +32° with sea water of the usual density, and at a temperature of +29°·5, will become congealed, owing to the degree of dilution not being in a proportion to maintain

the whole in a fluid state, or at least a portion of it, the remaining fluid portion having its density increased. It may appear rather a strange process that the ice dissolving so rapidly on the upper surface should be increasing nearly as rapidly on the opposite by a sort of transfer of the same water; and it is so far hypothetical; but there is no other way of accounting for what I observed on the east side of Cape Martyr, on 19th of July, in a deep and still bay, where the ice was then about 8 feet thick, nearly the whole of the lower half being a loose, spongy mass, in which scores of small fishes had been caught, cruelly detained, and "starved" to death, and myriads of infusoria and silicious algæ luxuriated in the utmost profusion."

MEASUREMENTS, in INCHES, of THICKNESS of the FLOE in ASSISTANCE BAY, showing the RATE at which it formed, its WATER-LINE, and the DEPTH of SNOW upon it.

The distance from the beach was about 200 yards, and the depth of water 7 fathoms.

a. Entire thickness from lower to upper surface, including the coating of snow.
b. Depth of ice beneath the water-line.
c. Space above the water-line, including—
d. The depth of snow on the ice where the hole was made.

—	a.	b.	c.	d.	—	a.	b.	c.	d.
1850.					1850.				
September 26	10½	—	—	1	November 3	30	25	5	2¾
" 28	11½	—	—	1	" 12	34	28	6	3
" 30	13¾	11¼	2½	1	" 13	34	29½	4½	2¾
October 2	15¾	12½	3¼	2¼	" 15	34¾	29¾	5	3
" 4	15¾	12½	3¼	2¼	" 19	34½	30	4½	1¾
" 7	16½	12½	4	2¾	" 29	36½	31	5½	2½
" 9	16½	13	3½	1½	December 3	40½	34½	6	2¼
" 11	17¼	13½	3¾	2	" 11	43	37	6	2¼
" 14	21	15	6	4	" 19	47	41	6	2¼
" 16	20¾	16	4¾	3½	1851.				
" 19	21½	17½	4	2¾	January 3	51	44	7	3
" 21	21¾	18¼	3½	2	" 24	58½	49½	9	4½
" 23	23½	18½	5	3½	February 1	64	54	10	4
" 25	24	19½	4½	2½	" 13	68¼	60¼	8	2¾
" 28	25	21	4	2½	March 3	72¾	63	9¾	4
" 30	26	22	4	1¾	April 3	85	74½	10½	3
November 1	28½	23½	5	2¾	May 10	91	—	—	—

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Table I.

Mean Height of the Barometer, and Mean Temperature of the Air, at Assistance Bay, "Lady Franklin," 1850–51.

Hours.	Barometer.			Temperature.			
	Nov.	Dec.*	Jan.†	Nov.	Dec.‡	Jan.	Feb.‡
	inches.	inches.	inches.	°	°	°	°
3 a.m. -	29·690	29·647	29·429	−7·0	−20·3	−29·1	−30·7
6 „ -	·698	·635	·435	7·0	20·7	29·4	30·7
9 „ -	·689	·624	·428	5·8	22·0	29·1	31·0
Noon -	·688	·632	·427	5·5	21·6	28·3	30·5
3 „ -	·681	·633	·428	6·2	21·5	28·4	30·1
6 „ -	·683	·625	·433	6·7	21·1	28·4	30·7
9 „ -	·677	·621	·435	7·2	20·5	28·5	30·9
Midnight -	·684	·617	·433	−7·9	−21·6	−29·1	−30·0
Means -	29·686	29·629	29·431	−6·7	−21·2	−28·8	−30·4

* December, 18 days only. † January, 26 days, 1st to 26th.
‡ The observations were complete only for noon, the other hours had only 16 observations in December, 17 in February, but the means have all been evaluated by the noon observations.

Table II.

Extreme Readings of the Barometer, with accompanying Temperature, Wind, and Weather, at Assistance Bay, "Lady Franklin," 1850–51.

1850-51.	Date.	Highest.	Temp.	Wind.	Weather.	Date.	Lowest.	Temp.	Wind.	Weather.	Range.
	d. h.	inches.	°			d. h.	inches.	°			inch.
November -	25 15	30·19	− 5·	N.N.E. 1	o c	10 9	28·93	+ 5·	S.E.b.E.6	o m	1·26
December -	8 3	29·92	−18·	E.N.E. 5	c	31 12	29·03	−27·	N.N.W.9	o	0·89
January -	16 0	29·83	−35·5	W.N.W.6	b	1 18	28·96	−37·	N.N.W.5	b	0·87

Table III.

Extremes of Temperature with accompanying Wind and Weather, at Assistance Bay, "Lady Franklin," 1850–51.

1850-51.	Date.	Max.	Bar.	Wind.	Weather.	Date.	Min.	Bar.	Wind.	Weather.	Range.
	d. h.	°	inches.			d. h.	°	inches.			°
November -	10 21	+14	29·10	N.W. 2	b c m	30 12	−23	29·89	N.E.b.E.8	b	37
December -	22 0	− 5	—	S.S.W. 4	c s	30 9	−37	29·29	N.N.W.5	o	32
January -	10 15	−12	29·45	W.S.W.1	o c	13 3	−40	29·55	N.N.W. 5	b	28
February -	16 3	−11	—	E. 9	s	7 0	−41	—	N.N.E. 9	s	30

Table IV.

Wind Components, Sums of Force, at Assistance Bay, "Lady Franklin," 1850–51.

Hours.	November 1850.				December 1850.				January 1851.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
3 a.m. -	51·7	23·7	50·9	17·5	113·2	12·1	23·5	55·0	101·5	4·3	4·5	35·6
6 „ -	52·1	22·0	49·2	20·0	113·0	11·5	19·0	55·5	95·1	3·5	6·6	38·3
9 „ -	42·8	29·3	49·7	15·3	100·9	15·2	18·7	45·7	92·7	—	5·8	34·5
Noon -	38·5	25·5	53·6	14·9	93·3	15·7	17·3	39·9	73·6	—	7·7	32·3
3 p.m. -	36·9	30·9	59·8	19·4	89·5	15·2	14·0	40·0	89·6	0·9	9·3	47·8
6 „ -	47·6	27·4	62·2	18·3	91·9	15·2	13·9	37·3	81·0	2·7	8·5	42·4
9 „ -	52·0	26·4	65·0	21·1	98·1	16·8	13·4	32·6	79·1	4·8	7·3	36·0
Midnight -	53·3	25·4	54·2	20·0	104·0	18·6	19·2	30·6	89·9	8·9	5·0	34·6
Mean -	46·9	26·3	55·6	18·3	100·5	15·0	17·4	42·1	87·8	3·1	6·8	37·7

Hours.	September 1850.				October 1850.				February 1851.			
4 a.m. -	40·1	23·3	40·2	59·4	79·8	17·1	25·5	29·6	101·6	16·8	45·6	14·7
Noon -	44·9	17·6	33·8	42·9	63·7	14·0	18·1	25·5	96·5	15·7	35·8	21·6
8 p.m. -	29·0	23·2	44·6	43·6	62·2	16·5	23·4	16·2	93·6	13·5	32·1	26·5
Mean -	38·0	21·4	39·5	48·6	68·6	15·9	22·3	23·8	97·2	15·3	37·8	20·9

Hours.	March 1851.				April (24 Days) 1851.				May (21 Days) 1851.			
4 a.m. -	130·2	20·4	49·6	29·1	43·7	23·8	41·1	10·3	44·7	39·5	20·4	49·7
Noon -	105·8	11·8	50·9	26·5	36·4	32·1	47·0	9·7	43·0	42·4	22·2	45·5
8 p.m. -	106·5	14·9	29·3	36·9	46·3	31·5	36·2	20·7	39·1	34·2	15·0	48·0
Mean -	114·2	19·0	43·3	30·8	42·1	29·1	41·4	13·6	42·3	38·7	19·2	47·7

Hours.	June (13 Days) 1851.				July 1851.				August (13 Days) 1851.			
4 a.m. -	19·8	20·8	5·4	49·9	20·8	67·4	55·2	59·8	15·1	15·3	18·5	12·7
Noon -	15·6	25·2	5·4	48·4	9·3	71·1	39·4	74·2	20·0	11·4	11·2	14·8
8 p.m. -	11·9	23·6	3·8	37·4	20·6	78·8	35·9	56·5	23·5	15·8	10·1	12·4
Mean -	15·8	23·2	4·9	45·2	16·9	72·4	43·5	63·5	19·5	14·2	13·3	13·3

Wind force 8 and upwards was noted: 24 times in November, 20 times in December, 16 in January, during three-hourly observations; September 12, October 6, February 17, March 28, April 9, May 11, June 0, July 6 for eight-hourly observations.

Table V.

Summary of Winds, referred to Sixteen Points, with Mean Force (Scale 0–12), at Assistance Bay, "Lady Franklin."

Months.	No. of Observations.	N.		N.N.E.		N.E.		E.N.E.		E.		E.S.E.		S.E.		S.S.E.	
		O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.
1850.																	
September	90	2	5·0	4	4·2	7	4·3	5	6·0	7	4·1	5	4·0	2	4·0	5	3·6
October	93	15	4·7	8	3·5	4	3·0	3	4·3	3	2·0	5	2·2	5	2·0	4	3·2
November	240	31	4·5	22	3·3	15	3·8	7	4·6	12	3·7	40	6·5	15	3·5	7	3·0
December	248	26	4·5	25	4·2	10	5·1	14	4·4	—	—	—	—	1	5·0	1	4·0
1851.																	
January	248	55	3·3	23	5·6	1	5·0	—	—	—	—	—	—	—	—	2	1·5
February	84	15	4·9	20	6·1	5	4·4	2	6·0	2	9·0	1	9·0	1	10·0	2	9·0
March	93	16	5·2	17	5·7	6	2·8	4	3·7	2	6·5	3	5·0	4	7·2	2	8·5
April	72	4	5·0	8	5·0	2	1·5	1	5·0	3	9·0	7	3·3	6	5·3	8	3·6
May	63	—	—	1	5·0	1	3·0	1	6·0	—	—	2	6·5	4	7·0	8	5·1
June	39	—	—	9	4·2	—	—	—	—	—	—	—	—	—	—	—	—
July	93	1	5·0	—	—	—	—	2	5·0	—	—	8	6·0	13	6·1	10	5·1
August	39	1	6·0	1	7·0	1	5·0	4	3·7	—	—	2	3·0	—	—	2	5·0

(continued)

Months.	S.		S.S.W.		S.W.		W.S.W.		W.		W.N.W.		N.W.		N.N.W.		Variable.		No. of Calms.
	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	
1850.																			
September	2	3·5	4	5·0	3	1·7	5	3·6	9	4·8	5	6·4	9	4·1	4	5·0	11	1·2	1
October	3	5·3	1	5·0	—	—	2	3·5	7	4·1	8	2·8	5	3·8	16	3·0	4	1·0	—
November	3	4·0	7	3·6	8	5·6	4	3·2	3	1·3	2	1·5	18	2·7	32	2·6	13	1·3	1
December	14	3·1	12	4·1	2	8·5	1	4·0	5	3·2	11	4·1	24	4·6	85	5·0	17	2·4	—
1851.																			
January	2	3·5	4	2·0	4	2·7	1	1·0	2	1·5	24	3·7	38	3·6	75	3·8	10	2·0	7
February	1	1·0	1	5·0	2	9·0	—	—	—	—	2	4·5	5	3·6	17	3·5	8	1·4	—
March	1	7·0	—	—	—	—	—	—	—	—	2	4·0	11	7·2	13	5·5	12	1·2	—
April	3	3·7	6	3·8	—	—	—	—	—	—	2	3·0	4	4·2	12	4·3	4	2·2	2
May	3	5·0	3	4·7	—	—	9	7·0	2	6·0	3	5·7	3	5·0	22	5·1	1	5·0	—
June	—	—	3	6·0	5	5·8	15	5·7	2	5·0	5	6·4	—	—	—	—	—	—	—
July	5	3·8	8	3·6	5	3·6	16	5·2	5	6·2	6	5·3	3	4·7	4	5·5	7	2·0	—
August	1	5·0	6	3·2	5	2·4	—	—	—	—	3	5·7	2	2·5	6	3·8	4	2·2	1

Table VI.

Weather Notations' at Assistance Bay, "Lady Franklin," 1850–51.

Hours.	November 1850.								December 1850.								January 1851.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
3 a.m.	8	9	13	8	—	—	3	—	6	13	12	1	—	—	—	1	15	5	11	2	1	—	1	1
6 „	4	7	19	14	—	—	1	1	5	13	13	2	—	—	1	1	14	5	12	4	1	—	2	—
9 „	3	12	15	12	—	—	1	1	6	14	11	1	—	—	1	1	12	8	11	5	1	—	2	1
Noon	6	10	14	11	1	—	1	—	7	15	9	1		—	1	1	16	7	8	4	—	—	1	1
3 p.m.	5	7	18	13	1	—	1	—	11	12	8	2	—	—	1	1	16	7	8	3	1	—	1	3
6 „	7	9	14	12	2	—	1	—	13	9	9	2	—	—	1	—	14	7	10	6	1	—	2	3
9 „	11	9	10	8	2	—	2	—	11	8	12	2	—	—	2	—	13	7	11	8	—	—	2	2
Mdnt.	12	9	9	5	1	—	3	—	12	7	12	3	—	—	3	1	13	9	9	6	—	—	2	3
Mean	7	9	14	—	—	—	—	—	9	11	11	—	—	—	—	—	14	7	10	—	—	—	—	—

Hours.	September 1850.								October 1850.								February 1851.							
4 a.m.	6	12	12	4	3	1	16	—	5	13	13	7	1	—	12	1	10	6	12	2	2	—	8	—
Noon	5	15	10	5	1	—	12	—	9	11	11	6	2	—	5	—	7	9	12	7	2	—	6	—
8 p.m.	5	14	11	4	—	2	11	—	14	5	12	10	1	—	5	1	5	4	19	6	1	—	10	1
Mean	5	14	11	—	—	—	—	—	9	10	12	—	—	—	—	—	7	7	14	—	—	—	—	—

Hours.	March 1851.								April 1851.								May 1851.							
4 a.m.	13	6	12	—	1	—	1	6	9	4	11	2	—	—	8	—	7	2	12	—	—	—	12	—
Noon	15	3	13	2	—	—	1	7	9	6	9	1	—	—	8	1	6	1	14	—	—	—	12	—
8 p.m.	14	1	16	1	2	—	1	8	10	6	8	—	—	—	8	—	7	4	10	—	—	—	10	—
Mean	14	3	14	—	—	—	—	—	9	6	9	—	—	—	—	—	7	2	12	—	—	—	—	—

Hours.	June 1851.								July 1851.								August 1851.							
4 a.m.	3	2	8	—	—	1	7	—	11	2	18	—	4	8	6	—	5	—	8	—	3	—	5	—
Noon	3	1	9	—	—	1	8	—	11	3	17	—	6	—	6	6	4	—	9	—	3	—	5	—
8 p.m.	2	3	8	—	—	2	7	—	10	4	17	1	4	8	4	—	4	4	5	—	2	—	3	—
Mean	3	2	8	—	—	—	—	—	11	3	17	—	—	—	—	—	4	2	7	—	—	—	—	—

Table VII.

Mean Temperature of the Air, at Assistance Bay, "Sophia," 1850-51.

Hours.	Mean Temperature.												
	1850.				1851.								
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.*	Year.
3 a.m. - -	+20°·7	+1°·1	−7°·3	−22°·1	−29°·4	−29°·8	−24°·7	− 9°·2	+ 7·4	+31°·5	+35°·1	+32°·4	+ 0°·5
6 „ - -	21·1	0·9	7·1	21·3	29·0	30·4	22·9	6·5	9·7	33·9	36·2	33·5	1·5
9 „ - -	21·5	2·2	6·5	22·0	29·0	30·9	21·4	− 2·7	13·2	35·7	39·3	36·5	3·1
Noon - -	23·1	2·7	6·1	21·6	28·9	29·8	18·7	+ 2·4	17·2	37·2	41·4	37·2	4·7
3 p.m. - -	22·8	2·0	6·3	21·4	28·9	30·0	19·5	+ 4·4	17·3	36·9	41·5	38·0	4·7
6 „ - -	21·3	1·3	6·6	21·4	28·6	30·6	22·0	− 1·0	14·6	35·5	38·9	36·9	3·2
9 „ - -	20·7	0·7	7·1	20·6	28·8	30·2	23·6	6·2	10·7	33·6	36·3	35·5	1·7
Midnight -	+20·0	+1·0	− 7·1	−22·0	−29·4	−30·0	−24·3	− 7·8	+ 8·0	+32·2	+34·4	+33·7	+ 0·7
Mean - -	+21·4	+1·5	−6·8	−21·5	−29·0	−30·2	−22·1	−3·3	+12·3	+34·6	+37·9	+35·5	+2·5

* 1st to 13th inclusive.

Table VIII.

Extremes of Temperature, with the Wind and Weather of the same Days, at Assistance Bay, "Sophia."

1850-51.	Day.	Max.	Aneroid.	Wind.	Weather.	Day.	Min.	Aneroid.	Wind.	Weather.	Range.
		°	inches.					inches.			
1850.											
September -	5th	+38	30·15	N.E. 1	c v	30th	+ 6°	29·96	W. 2	o c s	32°
October - -	9th	18	·01	S.E. 2	c v	28th	−14	30·00	N.W. 1	r m	32
November -	11th	+13	29·47	V. 9	o q s	30th	24	29·97	N. 2	o s	37
December -	22nd	− 4	·76	S.S.W. 2	c s	30th	37	·64	N.N.W. 5	v q s	33
1851.											
January - -	10th	11	·68	V. 1	m s	20th	41	·79	N.W. 4	m	30
February -	16th	10	·42	E.S.E. 7	q s	24th	45	30·16	Nly. 2	b m	35
March - -	30th	− 4	·87	N. 5	b c q	21st	41	·13	N.W. 9	m q s	37
April - -	17th	+34	30·39	S. 1	m s	2nd	31	·15	N.W. 2	c b v	65
May - -	31st	42	·26	V. –	o m s	2nd	−20	·42	S. 3	o m s	62
June - -	11th	49	·31	S.W. –	b c v	3rd	+16	·36	S.S.E. –	o m s	33
July - -	5th	50	·18	S.S.E. 4	c	23rd	29	·16	S.W. 2	f d	21
August - -	10th	+46	·50	N.E. 3	o m f	3rd	+31	29·40	N.E. 6	c s	15
Year - -	July	+50	—	—	—	Feb.	−45	—	—	—	95

The temperature of the sea in September, from daily observations, was 29°·1.

Remarks from the Logs of the "Lady Franklin."

1850.—SEPTEMBER.

1st	- -	Lat. 74° 43′ N., long. 92° W.
5th	- -	„ 74 47 „ 92 54′.
9th	- -	„ 74 45 „ 94.
10th	- -	„ 74 27 „ 95 30.
11th	- -	„ 74 34 „ 94 10.
12th	- -	Assistance Bay.
14th	- -	The whole bay covered with strong bay ice. Six foxes were caught and two white hares shot.

OCTOBER.

16th at 2 p.m.	-	A sun-dog on each side of the Sun.
19th at 10 p.m.	-	Very faint aurora, centre N.N.W.
20th	- -	Lanes of water seen in the offing.
21st at 9 a.m.	-	A parhelion on each side of the Sun, distant 22° 40′.
27th at 10 a.m.	-	Three parhelia around the Sun, distant 2° 40′, connected by an arch.

NOVEMBER.

3rd, 11.15 a.m.	-	A brilliant parhelion on each side of Sun, distant 22°, apparent altitude of Sun's lower limb 33′.
3rd, 6 p.m.	-	Faint aurora extending from W.N.W. to S.E.
8th, 3 p.m.	-	Two flashes of lightning seen to S.E. From 6 to 7.30 p.m. aurora extending in arch from W.N.W. to E.byS.
9th	- -	Thermometer on ice by comparison with a mercurial thermometer, 6° too high. [This thermometer was occasionally noted "chocked with snow."]
17th, 6 p.m.	-	A brilliant vertical ray shot from the Moon, and faint paraselenæ.
20th, 3.30 p.m.	-	A paraselena on each side of the Moon, distant 21° 47′, both with faint prismatic colours, also a white perpendicular ray.
24th, 4 p.m.	-	A faint halo round the Moon. At 8 p.m. a few faint rays of aurora.
30th, 8 p.m.	-	Faint aurora N.W. to S.S.E.

DECEMBER.

1st, 7 p.m.	-	A brilliant aurora from S.E. to N.W., colour bluish white.
2nd	- -	Found deck thermometer N. 16 broken; sent to Sir J. Ross on 30th.
2nd, 8.50 a.m.	-	A remarkably large and brilliant meteor fell to S.S.W.
8th, 6 a.m.	-	A brilliant aurora in S.E.
10th, 8 p.m.	-	A bright aurora S.S.W.
21st, 12.30 p.m.	-	Could read small print with tolerable ease.

1851.—JANUARY.

1st, 11 a.m.	-	Deeply coloured in the S.
2nd	- -	Thickness of floe near the ship 4 feet 3 inches.
2nd, 10 p.m.	-	A faint luminous arch stretching from N.N.W. to S.S.W.; altitude of centre 70°

3rd - -	Faint auroral rays in S.W. From 9 a.m. to 2 p.m. bright red sky in the Sd. At 5 p.m. faint aurora in S.W.
4th, 2 a.m. -	A faint auroral arc from N.N.W. to zenith.
6th, Noon -	A clear red sky to the Sd. At 4 p.m. the floe cracked round the ship.
7th, 9 a.m. to 3 p.m.	The sky to Sd. clear and red.
7th - -	Much water seen in the offing.
8th, 2 p.m. -	The clouds to Sd. radiating from above the sunlight in all directions. Vapour seen rising from water in many places.
9th - -	Twilight commences about 8 a.m.
10th, Noon -	Bright red and yellow sky to Sd.
11th - -	Several lanes of water in the offing.
13th - -	Mercury frozen; thermometer (spirit) —38°·5.
14th, 8 p.m. -	A double halo round the Moon.
16th, 8 p.m. -	A faint halo above the Moon.
18th, 6 p.m. -	A faint aurora shooting to Sd.
20th - -	Thickness of ice 5 feet 3 inches.
20th, 8 p.m. -	Aurora along the horizon from S.E. to N.W. of a faint saffron colour.
21st, 2 a.m. -	A faint halo round the Moon.
21st, Noon -	Temperature of water 29°.
22nd, 8 p.m. -	An auroral light towards the S.W.
27th - -	Water distant 5′ S.S.E.
28th, 8 p.m. -	A flash of lightning reported by one of the men.

FEBRUARY.

7th - -	Sun seen for first time since November 3rd.
27th - -	A small trout caught in the lake.
	Snowdrift frequently noted this month.

MARCH.

5th -	A large water off the harbour.
8th - -	Several seals seen; one shot.
16th - -	A bear seen.
17th - -	A seal seen.
	Snow drift frequently noted this month.

APRIL.

5th - -	A large bear seen.
9th - -	Shot a bear.
12th - -	Great refraction to Sd.; wind N.W. 2, b. A bear and two ravens seen.

MAY.

16th, 17th, 18th -	A number of bears seen and a reindeer in Wellington Channel. Shot a bear, also a ptarmigan.

JUNE.

24th -	Streams of ice.

JULY.

2nd - -	A deal of water outside the bay.
12th - -	Ice in the bay wasting fast.
20th - -	The ice breaking up outside the bay.
28th, at 4 p.m. -	Wind shifted from S.E. to N.W.

AUGUST.

3rd, at 6 a.m. -	The wind shifted suddenly from E.S.E. to N.N.W. A bear with two cubs seen.
4th, at 8 p.m. -	Average thickness of ice 5 feet.
5th, at 8 p.m. -	Thickness of ice 4½ feet.
11th - -	Broken-up ice.
12th, at noon -	Ship 4 miles Ed. of bay, patches of ice.
13th - -	Leopold Island S.S.W. 20′; straggling ice.

No. XI.

Results of Meteorological Observations at Northumberland Sound and at Wellington Channel.—H.M.S. "Assistance."

H.M.S. "Assistance" with the tender "Pioneer," under command of Captain Sir Edward Belcher, C.B., wintered in 1852-3 in Northumberland Sound, and having been unable to pass through the pack in the summer, were compelled to pass the winter 1853–4 in Wellington Channel, where the ships were finally abandoned in August 1854.

The meteorological journal which was kept by the officers of the "Assistance" has been deposited in the Meteorological Office. It is a voluminous register, wanting, however, in continuity, in uniformity, and in the necessary information regarding the instruments and observations.

Sir Edward Belcher in "The Last of the Arctic Voyages," a narrative of his command, has given an abstract of the meteorological observations in Appendix F. These "Meteorological Tables" are, however, far from satisfactory; the noon, midnight, and mean barometrical observations only are given, neither corrected for temperature nor accompanied by the attached thermometer readings; the maximum, minimum, and mean daily readings of the thermometers on the upper deck and on shore, and the mean temperature of the sea, are given, the results being carried for the most part to *three* decimal places; daily abstracts of the winds and weather are also given, but it is nowhere stated whether the direction of the winds is true or magnetic. The register has two columns for direction of wind, headed respectively *magnetic* and *true*. According to the register, the winds given in the "Tables" are magnetic from 1852 May 1st, to September 20th; on 21st and till October 8th, they are true; 1852 October 9th, to 1853 December, they are magnetic; 1854 January 1st to August 23, they are true. The register is so distinct and clear as to the direction of the wind, that it was at first followed without hesitation, but the final results suggested doubt as to whether the direction had been recorded correctly in the register. This led to a comparison of the winds as recorded in the ship's log (Record Office, Nos. 4538, 4539, and 4540) with those in the register. The entries of the wind in both documents are practically similar, and yet according to the ruling of the ship's log, the direction is by standard compass throughout. Accepting the authority of the ship's log, all the winds were regarded as magnetic, and were accordingly corrected for variation of the compass: at Northumberland Sound, 14 points West; in Wellington Channel, 13 points West. The results of a year's winds having been computed on this supposition, with results that still seemed improbable, the register of the "Assistance" was carefully compared with the log of the "Pioneer," (Record Office, Nos. 4541 to 4548). Fortunately the "Pioneer's" log distinctly marks the winds, when true, by the word *true* being written at head of the column, so as

to leave no possibility for doubt. The testimony of the "Pioneer's" log is to the effect that the winds recorded in the "Assistance's" register are *magnetic* till 1852, September 12th, at noon, and from that date until the end they are *true*. The computations relating to the winds had accordingly to be entirely remade, involving the entire results contained in Tables IX., X., XI., XII., XIII., and also the re-construction of Tables V. and VI. for Northumberland Sound, the entire results of Tables IX., X., XI., XII., XIII., and the re-construction of Tables VI. and VII. for Wellington Channel. The importance of inserting distinct information respecting methods of observation, in recording meteorological data, has thus been practically demonstrated by a large sacrifice of labour and time, while the danger of falling into erroneous generalizations was barely escaped.

It is evident that no discussion, in the serious sense of the word, had been attempted in compiling Appendix F. of Sir E. Belcher's book; and that the original observations must be dealt with *in extenso* in order that they might be fully utilised.

Sir E. Belcher appears to have been supplied with five barometers, Bates 75, 77, Newman 54, 117, 118, and six aneroids, Z. 164, 165, 166, 167, 170, 171. The register never specifies the instruments used, consequently there were no means afforded for applying any instrumental errors that may be known, and there was no choice but to take the observations as recorded and do the best with them. The barometer means and the single observations quoted have now been corrected for temperature, but no instrumental corrections having been applied, the results are, of course, only approximately accurate.

It appears from a memoir by John Welsh, F.R.S., in the "Proceedings of the Royal Society," Vol. VI., that seven mercurial thermometers and five spirit thermometers were graduated at the Kew Observatory for Sir E. Belcher's Arctic Expedition. The numbers of three of the mercurial thermometers (34, 46, 47), and of all the spirit ones (S. 2, 4, 6, 7, 8), are given, and the corrections for these latter are stated as follows:—

Corrections to the Scale Readings of Thermometers, by Welsh, obtained by Comparisons with Standard Instruments at the Kew Observatory. (See Roy. Soc. Proc., Vol. VI. p. 188.)

Mark and Number.	Correction for Scale Error.			
	At 0°.	At 32°.	At 52°.	At 65°.
Spirit S. 2 - -	−0·6	−0·8	−0·8	−0·8
" 4 - -	0	+ ·1	+ ·2	+ ·3
" 6 - -	0	+ ·3	+ ·3	+ ·2
" 7 - -	−1·7	−1·4	−1·4	−1·3
" 8 - -	− ·2	+ ·3	0	+ ·1

Mr. Welsh adds, "The spirit thermometers cannot by any means be considered as standards, although they are doubtless more trustworthy than most of those usually made."

There were, of course, numerous other thermometers supplied, but of these no particulars whatever can be found.

In the year 1868 the Kew Committee presented to the Meteorological Office three standard spirit thermometers, marked S. 2, S. 4, S. 6, said to have been made by the late J. Welsh. Their corrections were stated by Dr. B. Stewart to be as follows:—

CORRECTIONS to the SCALE READINGS of THERMOMETERS, by WELSH, obtained by COMPARISONS with STANDARD INSTRUMENTS at the KEW OBSERVATORY, 1860, February.

Mark and Number.	Correction for Scale Error.	
	At −40°.	At +32°.
Spirit S. 2 - -	+1·2	−0·9
" 4 - -	+2·2	+ ·1
" 6 - -	+0·2	− ·5

There seems to be little or no doubt that these are the instruments made for and used by Sir E. Belcher in H.M.S. "Assistance."

The following passages, copied from "The Last of the Arctic Voyages," have reference to the correctness of indication of the thermometers supplied, although it is of no use attempting to apply corrections to the recorded observations, as the register does not state the distinguishing numbers of the instruments used:—

"1853, January 6th.—Our temperatures seem now inclined to reach their lowest point. It is at present −51°·5, and falling; yet we do not feel the change. In some of the journals we may possibly find a minimum temperature nearly 2° below the standard, but the final results recorded in the Meteorological Journal will alone be correct. The annexed comparison of the seven best will indicate pretty clearly the value of the instruments:—

Standard.	2.	6.	8.	20.	3.	4.	5.
−20°	21°·0	20°·0	20°·6	21°·2	20°·4	20°·7	21°·1
−30	31·0	30·0	30·0	31·5	30·8	31·2	31·5
−40	40·5	39·6	39·8	40·5	40·5	39·5	41·3
−50	50·0	49·0	49·0	51·5	49·0	49·3	51·9

"January 15th.—The freezing point at which pure mercury (not impure amalgams of spurious mercury at low prices, but volatilized, distilled, adapted for thermometers, &c.) should congeal still continues to haunt me. Unfortunately, I left behind me every work on this subject to which I could, as to late date, refer. That −39°·5 is *not* the correct point of congelation our standard mercurial thermometers prove, nor do they always contract to the same division. The congelation of mercury does not appear to form any part of the acknowledged divisions on these thermometric (?) instruments: the mercury thermometers supplied to this expedition from Greenwich, as well as Kew, were graduated below −40°. I had myself remarked that no notice was taken of them

in the record, under the assumption probably that they could not, dare not, act contrary to *print*, but I ventured to differ, why I will state.

"On the 17th December I had noted that the mercury thermometers did not cease to act at −40°·3, −40°·0, −40°·0; this excited my attention; weekly I transcribe the register. On the 28th I noticed that the *registry* of all the mercurial thermometers ceased at the *same indication*, on the 4th January at −42°·3 by standard. Unfortunately I did not notice it earlier, but on the 23rd of January, on my copying the rough register, I inserted the following order: 'The mark *f* to be prefixed to D when the mercury is congealed, *p f* when partially congealed. The numbers 19, 35, 34, 2, read to −40° and below. The divisions below must be estimated, *i.e.*, the point where it congeals, or declines moving further.' He (mercury) had stopped most religiously at −39°·3, −39°·2, −39°·0, −39°·0; but in this case he was under martial law, and he knew he must move. I suppose he made his mind up to it, for I find the following curious register, taking care to satisfy myself frequently by personal inspection:—"

Noon, 1853.	Standard Spirit.	19.	35.	34.	2.
January 26 -	43°·0	42°·0	42°·0		41°·2
" " -	46·2	Estd. 46·0	50·0*		—
" " -	45·4	46·0	49·0*		—
" 31 -	45·7	45·0	—		—
February 3 -	42·9	42·0	42·0		41·0
" 10 -	41·7	41·5	41·5		40·6
" 21 -	44·5	42·5	42·5		42·0
" " -	43·8	43·0	43·0		43·4†
" 22 -	45·1	44·0	44·0	Broken.	43·2†
" " -	42·2	41·3	41·2		41·2†
" " -	41·6	40·6	40·6		40·0†
" 26 -	42·1	41·0	41·2		41·0†
" " -	42·3	41·2	41·2		41·0†
" " -	42·0	41·0	41·2		40·6†
March 3 -	43·3	42·2	42·2		41·8
" 8 -	44·2	41·2	41·3		41·1

* How came this change?
† If mercury freezes at −39° [now known to be −37°·9 (R. S.)], how is it that it continues to rise and fall in conformity with the spirit, between −39° and −46°?

NORTHUMBERLAND SOUND.

The winter quarters of H.M.S. "Assistance" in 1852–3 were in latitude 76° 52′ N., longitude 97° W., in Northumberland Sound. From a plan of the Sound given in "The Last of the Arctic Voyages," it would appear that the ship was land-locked from W. round by N. to S.E.; about a mile to southward was Herbert Island; farther off to the S.W. and W. were larger islands. To the W. rose Mount Beaufort; to the E., Mount FitzRoy; and to S.E., Mount Douglas.

From "The Last of the Arctic Voyages," it appears that in September 1852, one of the cutters was inverted, on supports, to afford a thermometer house. In this it was purposed to submit all the thermometers supplied to direct exposure on 180°, or half the circle facing the south (true). In October it states that one of the standard thermometers was placed on pikes at 4 feet above the earth, near the observatory, independent of the general board, containing fifteen standard thermometers from Kew and Greenwich, under the boat. From the autumn of 1852 to the summer of 1853, observations were made at the observatory on shore, and it is added: "The matters registered on shore coincided so nearly with those made by the best instruments on board, read two-hourly, that I had no misgivings as to the perfection of the observations, and consequently of the attention of those entrusted with their record."

The ships got out of Northumberland Sound on 1853, July 25th, and entered Port Refuge, on the southern part of Grinnell Island, on August 18th, where they remained until the 31st.

Table I. contains the means deduced from the barometrical observations, from which it appears that the mean for the year was 29·866, that the mean diurnal range is scarcely appreciable, although the results for the year show a maximum at 4 a.m. and at 8 p.m., a minimum at 2 a.m. and 2 p.m.; that, considering the monthly means, March was the highest, 30·079, and July the lowest, 29·610, though January was as low as 29·696.

Table II. exhibits the mean temperature of the air, as determined from the thermometer on deck. January was the coldest month, −38°·6, July the warmest, 36°·7; giving a mean range of 75°·3. The mean temperature of the year was 0°·6. The mean diurnal range of the thermometer in winter is almost imperceptible; in summer the maximum occurs about 2 p.m., the minimum about 2 a.m., and the same epochs are shown by the results for the entire year.

Table III. contains hygrometrical results for August 1853.

Table IV. gives the results of thermometrical observations taken on the floe at a distance from the ship. It will be seen by comparing them with the similar results in Table II., that the temperature on the floe was higher than on deck in October by 0°·9, November lower by 1°·4, December lower by 2°·7, January lower by 2°·1, February lower by 1°·2; March, they agreed. Probably the deck thermometer read higher in consequence of the warmth of the ship.

Table V. shows the extremes of atmospheric pressure, with the accompanying temperature, wind, and weather. The highest pressure, 30°·66, occurred in February, the lowest, 29°·17, in August, showing that the entire range of the mercurial column was one and a half inch. On the whole, the weather appears to have been clearer with the high than with the low pressures; with the former the wind was more commonly northerly, with the latter southerly; but the extremes of pressure do not appear to be related to any particular temperature.

Table VI. shows the extremes of air temperature, with accompanying pressure, wind, and weather. The highest temperature, 57°, was registered in July, the lowest, −57°, in January, giving a range for the year of 114°. The lowest temperatures seem related to calms or light winds from the north-westward.

Table VII. gives the means of the observations on the temperature of the sea-water at the surface or beneath the ice. It is at its maximum, 32°·2, in July, and at its minimum, 29°, in December; the mean for the year being 29°·8.

Table VIII. contains the results of the observations made on the temperature of the sea at the bottom, from which it will be seen that in September the bottom water was 0°·25 colder than the surface, and that there was no difference in October, November, December, and January. About the end of October 1852, Sir E. Belcher remarks in his narrative: "By all the experiments made, until I became sick of reported breakages of thermometers, I could not detect a well-attested difference between the temperature at the bottom, in seven fathoms, and that at the surface."

Table IX. gives the two-hourly sums of the wind components in each month, with their means.

Table X. gives the two-hourly sums of the wind components for the year, with their means, and also their resultants. These resultants show a tendency in the wind to back, though with some irregularity, from E. at noon to N.E. by E. ½ E. at 6 p.m., thence it veers to E. by 4 a.m., where it seems to hang until noon. As regards the force, it is at a maximum at midnight, and at a minimum about 5 p.m. The annual resultant is E. by N., force 0·27 by Beaufort's scale, or about 4·3 miles per hour.

Table XI. brings together the monthly resultants of the wind, with the mean force by Beaufort's scale, deduced from the means of the columns in Table IX. November had the strongest wind resultant, force 8 and upwards having been noted 29 times. The predominance of the south-easterly resultants is noticeable, and it would be interesting to discover its cause.

Table XII. gives the two-hourly sums of calms in each month. Calms were most frequent in April and May. January had them as often as July. The year round they were most frequent at 4 a.m., least at 6 p.m. The former was the hour most favoured with fog, the latter the least.

Table XIII. contains the monthly summaries of the winds, showing their distribution in azimuth, with their mean force.

Table XIV. contains the monthly summaries of weather notations. December had the most blue sky or clear weather and the least mist, August the most overcast and foggy weather. Snow fell during the year on 41 days. In November and December no snow fell. Snow fell only on one day in each of the months January and February. Rain fell on eight days, and except once in June, was confined to July and August.

The following interesting paragraphs are quoted from Sir E. Belcher's narrative:—

1852, November 30th.—"This evening a beautifully defined paraselena was observed about N.N.E. true. By measurement with sextant the interior circle was found to have a radius of 22° 10′ vertical as well as horizontal; the exterior 44°, the moon's altitude at the time about 30°. This beautiful phenomenon was represented by two concentric halos, incomplete near the horizon, accompanied by two strong crucial rays, vertical and horizontal, having the moon for their centre, the moon at this moment being four days past the full. It was also accompanied by arcs of other

eccentric circles, having their common centre at a point within the zenith. The greater of these intersected the moon and outer halos, forming, at their contacts, luminous spots. So nearly did this represent the rectangular crucial form at the moon, that it was only by following the lower rays of the greater eccentric halo that they could be traced to be really a segment of a great circle.

"At the points of intersection of these halos, bright paraselenæ, forming five on the lower and two on the upper arcs presented themselves; the moon and the intersections by the vertical rays, exhibiting the most luminous. The second eccentric circle did not intersect, at any visible point, the outer halo; but where the outer eccentric and vertical cut through the greater concentric, a sort of luminous nebula appeared to vibrate, affording an impression of the effect of an aurora. I did not at the time consider that it could in any manner have any connexion with the aurora or electric influence; but, on examining the magnetometer register, I found that between nine and midnight the instrument had been deflected from 124° to 134°, 110° to 125° being the customary range when nothing is noticed likely to be of interest."

1852, December 28th.—"It often occurs to me that it is injudicious to make so much parade about temperatures, when were it not for the thermometers few would feel the variation. On the other hand, the knowledge gives a man assurance of what he can bear, and furnishes him with a Mentor which prevents his exposure to undue cold without being prepared to meet it. It is curious to the uninitiated to view the Esquimaux dogs perfectly satisfied and luxuriating in the snow at this temperature. They have snow houses into which they can retire if cold pinches, but we do not perceive that they do so until the breeze makes it felt, and then the temperature rises with the force of the breeze. When the wind blows strong with drift the poor animals howl and move about evidently uncomfortable; hunger and frozen food may in part account for this, but why are they never frostbitten?"

1853, January 15th.—"As to any question arising to affect the registry of our instruments there can be no possible doubt. The observers have been too numerous to allow of mistake; the self-acting index tells its own tale; adverse observers watch every decimal division, and the lowest minimum thermometer, after severe investigation, has been rejected. I copy the following from the 'Meteorological Journal':—January 12th. About 9 this evening, being at dinner with my weekly party of officers, I was informed that the temperature had fallen below −62°. As this was a question not to be casually passed over, I visited the observatory, and remained walking about in my simple cabin dress for some time; −62°·5 was the lowest which I, as well as others, read at the standard. But the minimum thermometer indices, read next day at 8 a.m., only gave −62°·0, −61°·6, −66°·0, −63°·2. The night was bright and calm: no sensation of cold. −63°·2 is the external exposed thermometer, but was never *read* excepting by its *index*, at that graduation. This external thermometer, after severe testing under the boat, as low as −40°, with the entire range of spirit and mercury thermometers, was selected as the standard observatory gauge; supported on an open frame, attached to two pikes about 1 foot asunder, it was subjected, uncovered, to all the winds of heaven. That was *read* at −62°·5, and indicated what I have rejected, −63°·2.

"I was induced whilst writing these remarks to turn to Parry's work p. 145 (first voyage, 1819–20). On the 15th of February he remarks, as his coldest, the thermometer standing at −54° for fifteen hours and a half, but his maximum on that day was up to −32°."

1853, January 15th.—"We leave (I am as bad as the rest) our warm cabins at, say, −50°, rush on deck and on to the floe, after science or Bruin, it matters not, at (take the mean) −49°; 49 + 32 = 81° below freezing, and 50 + 49 = 99° change of temperature without damage!"

1853, January 24th.—"10° to 20° below the congealing point of mercury is hot work. The raw experimenter might easily lose his hands or life should he inadvertently take up the bottle containing half a gallon of alcohol at −58° or −60°, without the hands being properly protected."

1853, June.—"At this moment another perplexing circumstance must not be lost sight of. As yet we scarcely admit the existence of a gale; we certainly have not experienced the fierce ravages of tempests or hurricanes; we have the other extreme, intense cold and calms; these two must co-exist, the breeze and the intense cold, or the minimum of −62°·5 have not yet been experienced (*sic*)."

TABLE I.

MEANS OF BAROMETRICAL OBSERVATIONS, made at NORTHUMBERLAND SOUND, 1852 September, to 1853 August.

Hours.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Year.
2 a.m.	29·777	—	—	—	—	—	—	—	29·918	29·716	—	29·654	—
4 „	·779	29·953	30·065	29·900	29·697	30·039	30·078	30·013	·923	·717	29·611	·649	29·869
6 „	·777	—	—	—	—	—	—	—	·928	·723	—	·650	—
8 „	·771	·937	·048	·893	·694	·044	·081	·018	·924	·719	·608	·651	·866
10 „	·770	—	—	—	—	—	—	—	·917	·703	—	·652	—
Noon	·772	·929	·056	·882	·687	·045	·080	·019	·914	·697	·606	·659	·862
2 „	·772	—	—	—	—	—	—	—	·906	·702	—	·659	—
4 „	·781	·935	·038	·882	·702	·060	·085	·028	·901	·706	·612	·661	·866
6 „	·785	—	—	—	—	—	—	—	·904	·706	—	·665	—
8 „	·786	·943	·037	·881	·697	·058	·076	·030	·908	·727	·611	·664	·868
10 „	·783	—	—	—	—	—	—	—	·898	·724	—	·663	—
Midnight	·782	·936	·040	·877	·696	·055	·073	·025	·889	·723	·610	·663	·864
Means	29·778	29·939	30·047	29·886	29·696	30·050	30·079	30·022	29·910	29·715	29·610	29·658	29·866

Note to Table I.—In taking the means, only the observations at 4, 8, noon, 4, 8, midnight have been employed, for the sake of uniformity. The instrument used was designated the cabin barometer. It was discontinued during May and June. The hiatus has been filled by the records from the "Observatory Barometer," to which preference has not been given because it appears to have had some defect. This was proved by comparing the results from the two barometers with those of the readings of an aneroid also recorded in the register.

Table II.

Mean Temperature of the Air, at Northumberland Sound, 1852 September, to 1853 August.

Hours.	1852.				1853.								
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.*	Year.
a.m. - -	+17°·2	−1°·2	−5°·2	−30°·1	−38°·7	−28°·4	−18°·3	−12°·6	+10°·2	+30°·3	+35°·0	+32°·9	−0°·7
4 „ -	17·1	1·5	5·5	30·2	38·5	28·4	18·1	12·3	11·2	30·0	35·2	32·8	0·7
6 „ - -	17·8	1·5	5·9	30·4	38·4	28·3	18·4	11·2	12·6	30·1	35·8	33·1	−0·4
8 „ - -	18·5	1·5	5·1	29·9	38·2	28·3	18·1	9·8	14·5	31·0	36·3	33·6	+0·2
10 „ - -	19·3	1·5	4·1	29·7	37·8	28·3	17·1	8·4	15·8	32·2	37·1	34·7	1·0
Noon - -	19·5	1·3	4·0	29·9	38·3	28·2	16·2	7·4	18·2	33·3	38·1	35·2	1·6
2 p.m. - -	20·1	0·6	4·4	30·6	38·8	27·6	15·5	6·2	19·3	33·7	38·3	36·0	2·0
4 „ - -	19·6	0·8	4·1	30·5	38·6	28·2	16·1	6·0	19·5	33·7	38·0	35·7	1·8
6 „ - -	18·8	0·7	3·7	29·6	38·6	28·3	17·3	7·0	18·5	33·4	37·7	35·2	1·5
8 „ - -	18·5	0·7	4·2	30·0	39·0	28·2	17·7	7·8	15·9	32·9	37·2	34·2	0·9
10 „ - -	18·0	1·7	4·7	29·9	39·0	27·9	18·3	9·9	13·0	31·8	36·2	33·5	+0·1
Midnight - -	+17·7	−2·3	−5·0	−29·9	−38·8	−28·1	−18·5	−11·3	+11·4	+31·0	+35·3	+33·0	−0·5
Means - -	+18·5	−1·3	−4·6	−30·1	−38·6	−28·2	−17·5	−9·2	+15·0	+31·9	+36·7	+34·2	+0·6

* Mean of two thermometers on "deck."

Table III.

Hygrometrical Results, for August 1853, in Northumberland Sound.

Hours.	Wet Bulb.	Dew-point.	Vapour Tension.	Humidity.
2 a.m. -	32·3	31·4	·176	94
4 „ -	32·3	31·6	·178	95
6 „ -	32·5	31·6	·178	94
8 „ -	32·9	31·8	·180	93
10 „ -	33·9	32·7	·186	92
Noon -	33·9	31·9	·180	88
2 p.m. -	34·9	33·3	·191	90
4 „ -	34·5	32·7	·186	88
6 „ -	34·4	33·2	·190	92
8 „ -	33·6	32·7	·186	94
10 „ -	32·9	31·9	·181	94
Midnight -	32·2	31·1	·173	92
Means -	33·4	32·2	·182	92

Table IV.

Mean Temperature of Air, taken at a distance from the Ship, at Northumberland Sound, 1852–3.

Hours.	1852.			1853.		
	Oct.	Nov.	Dec.	Jan.	Feb.	March.
	On the Ice.	On the Ice.	On Shore.	On Shore.	On Shore.	On Shore.
8 a.m. -	−0°·6	−6°·3	−32°·8	−40°·6	−29°·5	−18°·2
Noon -	—	−5·5	33·0	40·5	29·4	15·9
4 p.m. -	—	—	−32·6	−40·4	−29·5	−16·2

Table V.

Extremes of Atmospheric Pressure, with accompanying Temperature, Wind, and Weather, at Northumberland Sound, Year 1852–3.

Month.	Date.		Highest.	Temp.	Wind.	Weather.	Date.		Lowest.	Temp.	Wind.	Weather.	Range.
	d.	h.	inches.	°			d.	h.	inches.	°			inch.
September 1852 -	11	16	30·13	+18·0	E.S.E. 2	c	28	2	29·19	+28·0	S. 1	o s	+0·94
October „ -	12	6	·45	−5·0	N.W. 2	b c	3	0	·45	+7·0	Calm	b c	1·00
November „ -	12	8	·55	+1·0	S.S.E. 5	b m	9	6	·39	+17·0	N. 7	o m	1·16
December „ -	16	18	·40	−38·0	Calm	b c	31	10	·20	−31·0	S.E. 4	c q	1·20
January 1853 -	15	4	·33	−44·0	N. 1	b	29	16	·20	−32·0	Calm	o m c	1·13
February „ -	5	8	·66	−20·0	N. 1	„	0	16	·44	−34·0	S.S.E. 3	b c m	1·22
March „ -	21	4	·57	+17·5	S.E. 1	b c	27	16	·68	0·0	S. 1	o m	0·89
April „ -	28	8	·50	+4·0	N.N.E. 5	b m	15	16	·46	−11·0	S.E. 5	o m q s	1·04
May „ -	3	20	·48	+2·0	N.E.b.N.1	o s	31	0	·43	+33·0	W. 1	b c f	1·05
June „ -	26	14	·17	+35·0	N.N.E. 3	b c	1	4	·44	+30·0	N.N.W. 3	o c	0·73
July „ -	4	0	29·71	+39·5	S.S.E. 5	b c q	29	12	·21	+32·5	S.W. 3	b c q	0·50
August „ -	31	6	·94	+29·0	N. 4	b c	18	10	·17	+33·0	S.S.E. 6	o c s	+0·77
Year - -	Feb.		30·66	—	—	—	Aug.		29·17	—	—	—	+1·49

Table VI.

Extremes of Air Temperature, with accompanying Pressure, Wind, and Weather, at Northumberland Sound, Year 1852–3.

Month.	Date.		Highest.	Bar.	Wind.	Weather.	Date.		Lowest.	Bar.	Wind.	Weather.	Range.
	d.	h.	°	inches.			d.	h.	°	inches.			°
September 1852 -	27	12	+32·0	29·32	E. 3	o	25	0	−1·0	29·55	N.N.E. 3	b c	+33·0
October „ -	2	0	+24·5	·69	S. 6	o s q	15	18	−21·0	30·16	N.W. 2	b c m	45·5
November „ -	17	10	+19·0	30·20	S.S.E. 5	m	6	14	−27·0	·36	N. 2	b c	46·0
December „ -	7	20	−7·0	29·81	N.W. 2	b	28	2	−41·0	29·82	Calm	„	34·0
January 1853 -	16	16	−9·0	·65	S.S.E. 8	c q	12	2	−57·0	·81	Calm	b m	48·0
February „ -	13	8	+2·0	30·23	N.E. 5	c o q	21	20	−44·0	30·06	N.W. 2	„	46·0
March - „ -	21	20	+22·0	·45	S.S.E. 5	o	5	8	−51·0	·23	W.N.W. 1	b o m	73·0
April - „ -	11	4	+10·0	29·87	N. 1	b c	16	13	−25·0	29·81	N.N.W. 1	b m	35·0
May - „ -	20	4	+36·0	·65	N.E. 2	b	6	12	−7·5	30·34	Calm	b c	43·5
June - „ -	25	2	+42·0	30·06	Calm	b c	7	14	+22·5	29·67	N.E. 3	„	19·5
July - „ -	13	8	+57·0	29·76	Calm	„	21	14	+26·5	·56	N.w.b.w. 5	c o q	31·5
August - „ -	11	0	+42·0	·68	Calm	„	30	16	+22·5	·88	N.N.W. 2	b c v	+19·5
Year - -	July		+57·0	—	—	—	Jan.		−57·0	—	—	—	+114·0

Table VII.

Mean Temperature of the Sea, at the Surface or beneath the Ice, at Northumberland Sound, 1852 September, to 1853 August.

Hours.	1852.				1853.								
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Year.
2 a.m. -	29°·8	—	—	—	—	—	—	—	—	—	—	30°·3	—
4 „ -	29·8	—	—	—	—	—	—	—	—	—	—	30·4	—
6 „ -	29·8	—	—	—	—	—	—	—	—	—	—	30·3	—
8 „ -	29·9	29·2	29·3	28·9	—	—	—	—	—	—	32·2	30·5	—
10 „ -	29·9	—	—	—	—	—	—	—	—	—	—	30·5	—
Noon -	30·0	—	29·3	29·0	29·1	29·0	29·2	29·5	29·5	31·6	32·2	30·9	29·9
2 p.m. -	30·0	—	—	—	—	—	—	—	—	—	—	30·8	—
4 „ -	30·0	—	29·3	29·0	—	—	—	—	—	—	32·1	30·8	—
6 „ -	29·9	—	—	—	—	—	—	—	—	—	—	30·7	—
8 „ -	29·9	29·2	29·3	29·0	—	—	—	—	—	—	32·1	30·4	—
10 „ -	29·9	—	—	—	—	—	—	—	—	—	—	30·4	—
Midnight -	29·8	—	—	—	—	—	—	—	—	—	—	30·3	—
Means -	29·9	29·2	29·3	29·0	29·1	29·0	29·2	29·5	29·5	31·6	32·2	30·5	29·8

Table VIII.

Temperature of the Sea, at the Bottom, Lat. 76° 51′ 51″ N., Long. 97° W., year 1852-3.

Hours.	1852.				1853.
	September 23rd to 30th.	October.	November.	December.	January 1st to 6th.
8 a.m. -	29°·7	29°·3	29°·3	29°·0	28°·9
Noon - -	29·7	29·3	29·3	29·0	29·0
4 p.m. -	—	—	29·3	29·1	29·0
8 „ - -	—	—	29·3	29·1	29·0

Table IX.

Sums of Wind Components, Northumberland Sound, 1852 September, to 1853 August.

Hours.	September 1852.				October 1852.				November 1852.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
2 p.m. -	16·1	26·3	17·5	22·8	33·3	8·2	9·0	21·0	36·9	49·5	54·2	6·8
4 „ -	17·2	23·7	16·7	18·4	31·5	5·8	11·3	20·3	32·0	47·6	55·8	8·9
6 „ -	18·1	27·7	17·1	17·3	32·2	5·0	11·3	20·2	31·1	47·6	59·9	12·3
8 „ -	21·7	28·6	19·6	14·6	38·6	7·0	11·3	20·9	31·3	43·1	60·7	14·3
10 „ -	19·8	31·6	20·2	14·7	33·7	9·4	12·7	17·4	29·0	43·1	62·9	12·7
Noon -	22·7	25·3	22·5	13·8	34·6	10·4	11·3	21·0	27·2	44·1	60·0	10·9
2 p.m. -	25·8	22·1	21·0	16·7	36·3	9·4	7·8	24·7	28·8	43·2	59·4	8·5
4 „ -	18·1	23·0	21·2	18·6	35·0	7·4	9·3	31·1	36·2	49·7	57·2	9·0
6 „ -	20·0	24·2	21·0	23·3	33·0	7·4	9·3	28·6	34·6	52·1	56·6	9·6
8 „ -	18·6	30·4	22·2	25·2	35·3	6·4	12·0	25·7	36·7	50·9	57·0	9·6
10 „ -	18·2	29·5	23·3	21·5	35·3	4·2	11·3	25·6	34·9	51·0	60·5	9·2
Midt. -	18·0	32·5	23·5	24·0	35·4	3·2	9·2	24·8	30·5	49·8	62·6	8·5
Means -	19·5	27·1	20·5	19·2	34·5	7·0	10·5	23·4	32·4	47·6	58·9	10·0

(*continued.*)

Hours.	December 1852.				January 1853.				February 1853.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
2 a.m. -	25·0	17·3	26·8	20·8	9·0	20·8	13·9	14·8	21·7	8·3	20·5	7·9
4 „ -	20·6	16·2	25·2	21·2	11·3	21·6	12·2	17·7	23·6	12·0	21·2	9·4
6 „ -	23·5	19·2	23·7	18·5	10·6	21·4	10·2	14·4	22·1	10·2	18·0	9·2
8 „ -	28·3	19·9	22·3	27·2	8·1	19·5	14·5	13·5	22·5	19·9	18·0	7·7
10 „ -	28·0	19·9	20·2	26·0	8·4	20·3	17·1	13·7	22·6	18·1	20·7	6·7
Noon -	25·7	24·4	20·2	24·6	13·8	24·8	19·2	14·0	23·2	16·0	22·7	4·5
2 p.m. -	23·2	23·8	19·7	22·3	13·6	25·7	18·4	16·3	26·6	16·3	22·9	3·5
4 „ -	17·3	23·5	25·3	26·4	14·8	26·7	20·4	15·7	20·7	17·1	26·8	5·6
6 „ -	17·6	24·0	24·8	22·7	14·2	25·9	17·0	14·8	21·4	15·0	25·5	5·4
8 „ -	22·5	24·6	26·6	20·0	12·8	21·5	13·7	17·1	18·9	14·8	26·5	7·6
10 „ -	20·7	24·4	29·3	19·0	12·7	20·6	13·5	15·8	24·3	12·4	19·3	8·6
Midt. -	21·5	22·7	35·8	18·5	11·0	18·0	13·9	10·9	21·4	10·4	17·4	8·5
Means -	22·8	21·7	25·0	22·3	11·7	22·2	15·3	14·9	22·4	14·2	21·6	7·1

Table IX. (*concluded*).

Sums of Wind Components, Northumberland Sound, 1852 Sept., to 1853 August.—*cont.*

Hours.	March 1853.				April 1853.				May 1853.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
2 a.m. -	13·0	39·3	36·3	7·9	26·1	3·5	12·3	5·6	23·2	6·4	4·2	13·5
4 „ -	12·0	39·4	31·1	6·4	28·5	6·6	15·3	11·4	21·0	9·2	6·9	8·1
6 „ -	9·8	42·7	30·8	6·5	32·8	2·8	16·1	8·3	19·5	7·6	8·5	6·8
8 „ -	9·0	41·9	32·5	7·3	34·9	2·8	12·5	10·4	20·6	5·4	9·2	9·7
10 „ -	9·4	42·4	32·4	7·6	35·8	2·9	13·2	13·2	22·7	5·8	8·1	8·7
Noon -	10·4	42·3	36·6	7·9	30·8	3·0	16·3	12·3	23·2	6·5	6·5	12·3
2 p.m. -	8·2	41·4	34·0	7·3	32·8	3·8	12·0	8·8	22·5	5·8	9·0	13·6
4 „ -	14·1	39·1	31·6	9·3	40·6	4·8	14·3	9·1	20·8	5·4	6·9	18·5
6 „ -	14·3	35·4	29·5	7·8	40·8	4·8	12·3	6·8	24·6	7·4	3·2	13·1
8 „ -	14·7	29·5	28·7	5·1	39·0	3·0	9·0	6·8	30·8	9·9	3·6	12·0
10 „ -	15·1	33·6	29·0	5·4	34·2	3·7	10·8	5·6	27·8	7·6	2·4	15·1
Midnight -	14·8	36·4	40·1	8·9	34·4	3·5	13·0	7·0	23·7	5·4	7·6	15·8
Means -	12·1	38·6	32·7	7·3	34·2	3·8	13·1	8·8	23·4	6·9	6·3	12·3

(*continued.*)

Hours.	June 1853.				July 1853.				August 1853.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
2 a.m. -	27·8	18·9	15·4	9·1	10·9	30·6	17·8	23·2	17·7	23·1	33·6	13·0
4 „ -	31·0	20·7	15·9	9·8	10·1	27·2	17·0	22·2	16·6	28·9	29·3	10·7
6 „ -	27·8	22·2	11·6	7·6	10·1	25·1	17·8	19·4	20·2	29·6	23·9	21·9
8 „ -	27·1	22·7	13·4	10·7	12·3	24·4	17·5	23·2	20·9	27·2	25·6	21·9
10 „ -	27·5	23·7	11·5	12·8	12·0	26·2	17·6	23·0	15·7	23·7	23·0	23·4
Noon -	29·7	23·0	10·4	15·6	14·9	27·0	16·9	26·0	19·9	21·4	22·8	21·1
2 p.m. -	29·1	20·3	8·5	17·5	14·4	28·8	13·4	24·7	19·9	17·2	24·8	19·5
4 „ -	36·2	17·8	16·3	19·9	9·9	30·2	10·1	19·7	19·8	12·7	25·4	22·7
6 „ -	36·4	16·4	13·3	20·0	9·9	28·0	11·9	18·5	25·5	21·3	25·1	21·0
8 „ -	29·1	15·3	9·7	16·3	15·9	32·0	24·7	20·6	22·5	26·3	25·6	16·6
10 „ -	26·5	14·7	12·8	14·6	11·4	33·4	19·6	19·8	25·7	25·8	27·6	19·5
Midnight -	27·4	19·2	15·6	9·0	10·7	34·7	20·4	23·4	23·7	21·7	35·9	16·0
Means -	29·6	19·6	12·9	13·6	11·9	29·0	17·1	22·0	20·7	23·2	26·9	18·9

Table X.

Sums of Wind Components and Resultant Winds, at Northumberland Sound, for the Year 1852 September, to 1853 August.

Hour.	N.	S.	E.	W.	Resultants.	
					Direction.	Force.*
2 a.m. -	260·7	252·2	261·5	166·4	N. 85° E.	96
4 „ -	255·4	258·9	257·9	164·5	S. 88 E.	94
6 „ -	257·8	261·1	248·9	162·4	S. 88 E.	87
8 „ -	275·3	262·4	257·1	181·4	S. 84 E.	76
10 „ -	264·6	267·1	259·6	179·9	S. 88 E.	80
Noon -	276·1	268·2	265·4	184·0	N. 84 E.	82
2 p.m. -	281·2	257·8	250·9	183·4	N. 71 E.	72
4 „ -	283·5	257·4	264·8	205·6	N. 66 E.	65
6 „ -	292·3	261·9	249·5	191·6	N. 62 E.	65
8 „ -	296·8	264·6	259·3	182·6	N. 67 E.	83
10 „ -	286·8	260·9	259·4	179·7	N. 72 E.	84
Midnight -	272·5	257·5	295·0	175·3	N. 83 E.	121
Means -	275·2	260·9	260·8	179·8	N. 80 E.	83

* Must be divided by 365 to get the mean force at the given hour.

Table XI.

Monthly Resultants of the Winds, at Northumberland Sound, 1852 September, to 1853 August.

Month.	Resultants.	
	Direction.	Force.†
September 1852 -	S. 10° E.	0·26
October „ -	N. 25 W.	0·98
November „ -	S. 73 E.	1·72
December „ -	N. 68 E.	0·09
January 1853 -	S. 2 E.	0·34
February „ -	N. 60 E.	0·60
March „ -	S. 44 E.	1·19
April „ -	N. 8 E.	1·33
May „ -	N. 20 W.	0·57
June „ -	N. 4 W.	0·33
July „ -	S. 16 W.	0·58
August „ -	S. 70 E.	0·27

† In grades of Beaufort's scale.

Table XII.

Calms noted at Northumberland Sound, 1852 September, to 1853 August.

Hours.	1852.				1853.								
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Year.
2 a.m. - - -	8	4	5	8	10	8	6	10	12	5	5	3	84
4 „ - - -	8	4	6	8	8	7	12	8	11	5	10	4	91
6 „ - - -	8	5	6	8	8	7	11	8	11	5	10	2	89
8 „ - - -	6	4	3	5	8	4	8	8	11	4	8	3	72
10 „ - - -	7	3	3	5	8	4	8	8	11	4	8	4	73
Noon - - -	7	3	4	5	4	6	8	10	11	5	7	4	74
2 p.m. - - -	6	2	4	4	4	6	8	10	11	5	7	3	70
4 „ - - -	6	1	1	5	6	6	5	7	8	2	9	5	61
6 „ - - -	6	1	1	5	6	6	5	7	8	2	9	4	60
8 „ - - -	7	1	3	7	10	3	6	9	8	1	7	3	65
10 „ - - -	7	1	3	7	10	3	6	8	9	1	7	3	65
Midnight - - -	8	3	5	8	10	8	6	11	11	5	5	5	85
Means - - -	7	3	4	6	8	6	7	9	10	4	8	4	889

Force 8 and upwards was noted as follows: September 6 times, November 29, January 1, February 1, March 16, August 4.

Table XIII.

Summary of Winds, referred to Sixteen Points, with Mean Force (Scale 0 to 12), at Northumberland Sound.

Month.	Total Observations.	N.		N.N.E.		N.E.		E.N.E.		E.		E.S.E.		S.E.		S.S.E.	
		O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.
1852.																	
September	360	24	4·1	5	3·4	9	5·5	3	3·7	23	3·4	5	3·0	29	4·4	14	2·3
October	372	66	2·1	4	3·2	53	2·9	—	—	—	—	—	—	8	2·0	—	—
November	360	18	4·0	21	4·0	19	4·7	33	4·7	8	3·1	17	7·0	68	4·3	74	4·6
December	372	11	2·1	12	1·9	27	4·0	9	2·5	2	2·0	7	1·7	59	3·6	12	5·1
1853.																	
January	372	13	1·2	7	1·1	20	1·4	7	1·7	2	4·0	8	3·7	33	3·6	25	3·1
February	336	22	2·2	19	1·9	55	2·9	10	2·8	10	3·1	3	2·3	30	2·4	21	2·3
March	372	13	1·3	12	2·2	34	2·1	5	1·0	5	1·6	11	3·7	67	4·4	41	4·4
April	360	59	2·2	19	3·0	26	3·4	10	3·8	1	4·0	—	—	7	4·3	5	1·4
May	372	34	2·2	18	1·6	32	1·9	7	1·3	2	1·0	—	—	4	1·0	8	1·8
June	360	21	2·0	28	3·0	62	2·2	8	2·1	1	2·0	2	2·0	2	2·0	7	2·1
July	372	5	2·4	—	—	7	1·9	3	3·0	8	2·6	13	3·3	31	3·2	36	4·0
August	372	17	2·5	16	3·7	19	2·7	18	4·2	25	2·8	17	2·8	32	1·9	29	4·2

(*continued.*)

Month.	S.		S.S.W.		S.W.		W.S.W.		W.		W.N.W.		N.W.		N.N.W.		Variable.		No. of Calms.
	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	
1852.																			
September	33	3·5	4	2·7	21	3·6	14	3·5	6	2·8	35	1·9	46	1·4	4	2·7	1	2·0	84
October	20	3·3	2	2·0	1	2·0	2	2·0	50	2·6	6	2·2	114	1·5	14	2·9	—	—	32
November	1	1·0	—	—	1	2·0	—	—	3	3·7	11	2·4	32	3·2	10	3·1	—	—	44
December	8	2·5	4	3·5	9	1·6	2	2·0	5	1·8	75	2·6	32	2·2	8	1·9	15	1·2	75
1853.																			
January	22	1·9	11	2·9	14	2·3	5	2·0	18	1·4	20	2·4	59	1·5	9	1·7	7	1·3	92
February	24	2·5	4	1·5	4	1·2	2	1·5	11	1·7	8	2·0	30	1·9	13	2·1	4	1·0	66
March	28	2·0	3	3·7	5	1·2	3	1·7	9	2·0	13	1·6	30	1·7	4	1·7	—	—	89
April	7	2·0	—	—	—	—	2	2·5	4	2·0	7	1·3	55	1·9	44	2·0	10	1·0	104
May	22	1·7	7	2·3	7	1·6	8	2·1	16	1·9	3	2·0	48	1·6	31	2·5	3	1·0	122
June	56	3·4	5	1·8	12	2·2	5	1·2	21	1·2	11	1·9	36	2·3	39	2·2	—	—	44
July	25	2·4	17	1·8	23	2·0	8	1·4	34	1·6	23	3·2	39	2·8	7	2·6	—	—	93
August	12	1·8	15	2·0	24	3·5	9	3·5	27	1·5	18	2·5	34	1·9	17	1·9	—	—	43

Table XIV.

Summary of Weather Notations, made at Northumberland Sound, 1852 September, to 1853 August.

Hours.	September 1852.								October 1852.								November 1852.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m	f.	r.	s.	q.
2 a.m.	2	14	14	5	—	—	4	2	5	10	16	6	—	—	3	2	10	6	14	9	—	—	—	1
4 „	2	14	14	5	—	—	6	3	4	11	16	11	—	—	3	2	10	7	13	8	—	—	—	1
6 „	3	13	14	2	1	—	7	5	4	12	15	11	—	—	2	2	10	7	13	8	—	—	—	1
8 „	3	14	13	1	1	—	5	5	6	11	14	9	—	—	3	2	9	6	15	10	—	—	—	1
10 „	3	14	13	3	1	—	4	5	6	12	13	9	—	—	3	2	9	6	15	10	—	—	—	1
Noon	4	13	13	3	1	—	4	5	8	13	10	6	1	—	1	2	10	6	14	11	—	—	—	2
2 p.m.	4	12	14	2	1	—	6	4	7	13	11	6	1	—	2	2	9	7	14	11	—	—	—	2
4 „	4	13	13	3	1	—	6	3	6	12	13	5	—	—	2	2	10	6	14	12	—	—	—	3
6 „	4	13	13	4	—	—	6	2	6	12	13	5	—	—	1	2	10	5	14	11	—	—	—	3
8 „	4	14	12	3	—	—	5	2	5	10	16	6	—	—	2	1	11	6	13	11	—	—	—	2
10 „	2	14	14	4	—	—	5	2	5	11	15	6	—	—	1	—	11	6	13	11	—	—	—	2
Midt.	3	14	13	4	—	—	4	2	5	9	17	6	—	—	1	—	10	6	14	9	—	—	—	1
Means	3·2	13·5	13·3	3·2	0·5	—	5·2	3·3	5·6	11·3	14·1	7·2	0·2	—	2·0	1·6	9·9	6·3	13·8	10·1	—	—	—	1·7

(*continued.*)

Hours.	December 1852.								January 1853.								February 1353.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
2 a.m.	21	8	2	2	—	—	—	2	15	11	5	6	—	—	—	4	11	12	5	10	—	—	—	2
4 „	20	8	3	2	—	—	—	2	13	11	7	10	—	—	—	4	9	12	7	10	—	—	1	4
6 „	20	8	3	2	—	—	—	2	14	11	6	10	—	—	—	4	9	12	7	10	—	—	1	4
8 „	20	7	4	2	—	—	—	3	16	12	3	5	—	—	—	2	12	12	4	11	—	—	—	5
10 „	20	7	4	2	—	—	—	3	16	12	3	5	—	—	—	2	12	12	4	11	—	—	—	5
Noon	18	7	6	2	—	—	—	1	14	10	7	8	—	—	—	5	12	11	5	5	—	—	1	5
2 p.m.	18	7	6	2	—	—	—	1	14	10	7	8	—	—	—	5	12	11	5	5	—	—	1	5
4 „	19	6	6	4	—	—	—	2	14	10	7	7	—	—	—	6	8	15	5	3	—	—	—	5
6 „	19	7	5	4	—	—	—	3	14	10	7	7	—	—	—	6	8	15	5	3	—	—	—	4
8 „	21	9	1	3	—	—	—	3	15	10	6	5	—	—	1*	4	13	12	3	8	—	—	1	3
10 „	21	9	1	3	—	—	—	3	16	10	5	5	—	—	1*	4	13	12	3	8	—	—	1	3
Midt.	20	9	2	2	—	—	—	3	16	8	7	6	—	—	—	3	12	12	4	10	—	—	—	2
Means	19·7	7·7	3·6	2·5	—	—	—	2·3	14·8	10·4	5·8	6·8	—	—	0·2	4·1	10·9	12·3	4·8	7·8	—	—	0·5	3·9

* Hail.

TABLE XIV. (*concluded*).

SUMMARY OF WEATHER NOTATIONS, made at NORTHUMBERLAND SOUND, 1852 September to 1853 August—*cont.*

Hours.	March 1853.								April 1853.								May 1853.							
		c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
2 a.m.	6	15	10	7	—	—	1	4	9	16	5	11	—	—	2	5	9	11	11	10	—	—	6	3
4 „	8	15	8	9	—	—	2	7	10	14	6	13	—	—	2	5	7	12	12	13	—	—	9	3
6 „	8	15	8	9	—	—	2	7	10	14	6	13	—	—	2	5	7	12	12	13	—	—	9	3
8 „	10	13	8	6	3	—	1	6	12	10	8	13	—	—	2	3	7	11	13	13	—	—	5	1
10 „	10	13	8	6	3	—	1	6	13	10	7	14	—	—	3	3	7	11	13	13	—	—	5	1
Noon	11	12	8	5	1	—	1	5	10	14	6	15	—	—	2	6	7	15	9	11	—	—	3	3
2 p.m.	11	11	9	5	1	—	1	5	10	14	6	15	—	—	2	6	7	15	9	11	1	—	3	3
4 „	11	14	6	3	—	—	1	5	12	14	4	12	—	—	2	7	7	13	11	12	—	—	4	4
6 „	11	14	6	3	—	—	1	5	12	13	5	12	—	—	2	7	7	13	11	12	—	—	4	4
8 „	9	14	8	9	1	—	3	5	14	10	6	8	—	—	2	—	6	10	15	8	—	—	5	2
10 „	9	14	8	9	1	—	3	5	14	10	6	8	—	—	2	—	7	11	13	8	1	—	5	2
Midt.	7	14	10	7	—	—	2	5	11	14	5	11	—	—	2	4	8	12	11	10	—	—	6	3
Means	9·2	13·7	8·1	6·5	0·8	—	1·6	5·4	11·4	12·8	5·8	12·1	—	—	2·1	4·2	7·2	12·2	11·6	11·2	0·2	—	5·3	2·7

(*continued.*)

Hours.	June 1853.								July 1853.								August 1853.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
2 a.m.	5	13	12	7	1	—	6	5	5	13	13	11	1	5	2	6	6	10	15	7	3	1	5	3
4 „	5	12	13	8	2	—	4	7	6	13	12	13	3	3	1	5	4	7	20	7	6	1	7	2
6 „	5	12	13	8	2	—	4	7	6	13	12	13	3	3	1	5	4	8	19	7	5	1	6	2
8 „	6	12	12	8	3	1	2	4	6	12	14	9	6	3	1	5	3	11	17	9	4	2*	7	2
10 „	6	14	10	9	2	1	1	4	7	11	13	9	6	3	1	3	3	9	19	12	2	2	6	3
Noon	7	12	11	9	3	1	5	6	4	15	12	17	3	4	—	3	4	9	18	13	1	—	2	3
2 p.m.	6	13	11	7	—	1	5	6	4	15	12	17	2	4	—	3	5	11	15	12	—	1	2	2
4 „	7	12	11	7	—	—	4	3	5	16	10	12	3	1	—	6	3	12	16	7	1	3	2	3
6 „	7	11	12	7	—	—	4	3	5	17	9	12	2	1	—	6	4	9	18	8	1	2	2	3
8 „	7	12	11	8	1	—	3	3	6	16	9	7	2	2	1	9	5	11	15	5	3	3	1	4
10 „	7	12	11	8	1	—	3	3	6	16	9	7	2	2	1	9	6	11	14	6	1	2	2	3
Midt.	6	11	13	7	2	—	6	6	5	15	11	10	2	3	2	8	6	13	12	7	2	1	5	4
Means	6·2	12·2	11·6	7·7	1·4	0·3	3·9	4·7	5·4	14·3	11·3	11·4	2·9	2·8	0·9	5·7	4·4	10·1	16·5	8·3	2·4	1·6	3·9	2·8

* Hail.

REMARKS from the ADMIRALTY LOG of H.M.S. "ASSISTANCE."

1852.—OCTOBER.

1st - Three ptarmigan shot. Open water about a quarter of a mile ahead of ship.
2nd, 2 a.m. - Open water about 200 yards from ship.
5th - - Shot a bear.
20th - - Caught a fox.
26th - - Saw a raven fly over the ship; also on 27th.

NOVEMBER.

9th, 10th, 11th, 12th. Heavy snowdrift. Maximum thermometers 137, 140, 142, broken by the wind.
21st, p.m., and 22nd, a.m. Snowdrift.

DECEMBER.

2nd,* at 9.30 p.m. Aurora in a light narrow streak extended from the summit of the Observatory Hill, passing immediately through the zenith in a direction S. by E. (true), terminating in a feather end about 25° N. of zenith. Four cumuli-shaped masses appeared as though only about a couple of hundred feet above the mastheads; these masses lasted about 3 minutes, and then suddenly disappeared, having apparently shifted their position about 20 feet during that time. The long streak gradually vanished in about 8 minutes. The sky was perfectly clear.
6th, 10 p.m. - Aurora bright to Nd. (mag.).
7th, a.m. - Snowdrift.
9th, Midnt. - Aurora very vivid in the S.W. (mag.).
10th, 7 a.m. - Aurora in S.E.
12th, 3 a.m. - Aurora in S.W. horizon, which gradually approached until it formed a complete arch over the ship in a N.E. and N.W. direction. It extended from the back of the hill on which the wires are placed to about a mile to Ed. of the ship, and was evidently attracted by the wires. At one time it was not more than 100 feet from the observatory. Its coruscations all started to the zenith. The magnetometer was affected, but not the electrometer.
16th - - Saw three bears close to the ship, and again on 17th.
19th, 20th - Snowdrift.

1853.—JANUARY.

17th, a.m. - - Heavy snowdrift.
28th - - Killed a bear.

MARCH.

16th - - Shot three bears.
23rd - - Three seals seen on floe.

MAY.

2nd - - Open water from the southern extremity of Northumberland Sound to Spit Island.
6th - - Bay ice forming over the open water.

* This note has been copied from the Meteorological Register.

12th	Two bears seen.
14th	Saw a snow-bunting.
17th	Shot a seal on the floe.
21st	Saw a wolf about a mile from the ship.
23rd	A wolf close to ship ; a bear about four miles off.
25th	A bear seen.
28th	Water open to Sd. and Wd. Saw two bears.
29th	Saw two bears.
30th	A wolf seen.

JUNE.

1st	Dovekies seen.
4th	Several holes of water showing.
5th	Saw two ducks.
11th	Saw several ducks on the water.
14th	A wolf seen.
15th	Saw a bear.
27th	Loose ice drifting down channel to S.E., and more open water seen.
30th	Open water 230 fathoms from the ship.

JULY.

1st	Open water 400 yards from the ship.
2nd	Recovered Six's thermometer No. 241, from tube on shore where it was frozen.
15th	Warping through the ice, along the land.
25th	Got out of Northumberland Sound.

AUGUST.

8th	The floe 5 feet 5 inches thick.
18th to 31st	In Port Refuge.
22nd	Killed five hares.
23rd	Shot two hares, seven ducks, one dovekie.
24th	Shot forty gulls, one hare.
26th	No water to be seen from the hill.
30th	A large flock of ducks in the bay.
31st	Working through the floe.

WELLINGTON CHANNEL.

On September 2nd, 1853, H.M.S. "Assistance" and "Pioneer" were in latitude 75° 37′ N., longitude 92° 22′ W. On the 12th, the latitude was 75° 32′ N. From this time they were frozen up. The position of their winter quarters was latitude 75° 31′ N., longitude 92° 10′ W., close in with the land, "which ascending by terraces, attained an elevation of about three hundred feet in a mile, or possibly from the nearest beach, about one hundred feet in one hundred yards."

The instruments were the same as those used in Northumberland Sound during the previous year. "The last of the Arctic Voyages," Vol. II., p. 66, states:—"Our thermometric comparisons for this season have, owing to our insecurity and chances of destruction to the instruments, been confined to the floe, and, in order to avoid any influence from the ship, they have been fitted in a small boat, inverted and suspended from the driver boom astern of the ship, their bulbs being five feet above the present upper level of the ice. In addition to this, at six feet from the ship's stern, very substantial snow-walls of eighteen inches thickness are also interposed. This leaves them fully exposed from our prevailing winds, or from E. round by the S. to S.W."

Table I. contains the results of the two-hourly barometrical observations. The highest monthly pressure was 30·005 in April, the lowest 29·614 in January. The mean for the year was 29·778. The results of the entire period show a diurnal range having maxima at 6 a.m. and p.m., and minima at 2 a.m. and noon.

Table II. gives the means deduced from the two-hourly observations on the temperature of the air. They show that the warmest month was July, with mean 38°·1, the coldest February, −22°·4; so that the mean annual range was 60·5°. The mean temperature of the year was 5°·5.

Table III. gives similar information to that in Table II., deduced from observations taken from a thermometer on the upper deck. These results are lower than those from the thermometer under the boat by from 3° to 4° in winter, and are a trifle higher in summer.

Table IV. gives similar information to that in Tables II. and III., deduced from a thermometer erected on the floe, from which it appears that the floe was colder, on an average being below the thermometer under the boat, in November, 11°·2; December, 12°·1; January, 20°·6; February, 17°·5; March, 11°·1; April, 7°·9; May, 2°·7; June, 2°·4. These differences are so large that it must be concluded there was an imperfection either in one or other of the thermometers or in the manner of their exposure.

Table V. shows the hygrometrical results obtained for September 1853.

Table VI. exhibits the highest and lowest readings of the barometer in each month, with the accompanying temperature, wind, and weather. The highest during the year was 30·50 in March, the lowest, 28·94, in January, giving a range of 1·56 inches.

Table VII. exhibits the maximum and minimum temperatures of each month, with the accompanying pressure, wind, and weather. The highest temperature, 48°, was

reached in August, the lowest, −38°, in January and February, giving an entire range of 86°.

Table VII. gives the results of observations on the temperature of the sea at the surface.

Table IX. contains the two-hourly sums of the wind's components, with their means for each month.

Table X. contains the two-hourly sums of the wind's components, with their means for the entire period of 357 days; and also the two-hourly resultants of wind, from which it appears that the maximum force of the wind occurs about 2 a.m., the minimum about 2 p.m.

Table XI. shows the monthly resultants of the wind, with the force on Beaufort's scale.

Table XII. shows the two-hourly notation of calms. On the whole they occur more frequently by night than by day, and more often in the winter than in the summer.

Table XIII. exhibits monthly summaries of the winds, referred to sixteen points, with the mean force (scale 0 to 12).

With reference to the winds, "The Last of the Arctic Voyages" states, under March 1854: "In these latitudes, no gales blow continuously beyond twenty-four hours, and our sure guide 'of its heart being broken' is the diminution of temperature; below −40° it does not blow hard, and at −60° wind is not experienced."

"March 5th.—We have not, for a long period, been visited by any strong winds, but it now threatens in squalls from the south-east or off the land. Notwithstanding it has not yet been felt by us, we are still annoyed by the peculiar whistling aloft, with rapid scud, attended by the unmusical beating of the small ropes against the masts. Upon a careful review of the winds, I find that no strong wind from south round by the *west* and thence to north, or over the western half circle, has prevailed for twenty-four hour hours, or blown with any force since we have been here now nearly six months. The question naturally arises, Are we to experience it in July and August, with the ice in motion? If so, our position will be one of intense anxiety."

Table XIV. gives the two-hourly summaries of the weather notations. The most fog occurred in August; there was no fog during the winter. During the six winter months ending with April snow fell only on 11 days; during the rest of the period it occurred on 26 days. June and July had squally strong winds. Rain fell only on 9 days, chiefly in June.

TABLE I.

MEANS OF BAROMETRICAL OBSERVATIONS, made at WELLINGTON CHANNEL, 1853 September, to 1854 August 23rd.

Hours.	1853.				1854.								
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Year.
2 a.m. - -	29·738	29·797	29·719	29·821	29·605	29·709	29·831	29·986	29·973	29·757	29·636	26·727	29·775
4 „ - -	·740	·794	·722	·821	·607	·713	·831	·991	·976	·758	·635	·731	·777
6 „ - -	·744	·795	·723	·816	·608	·717	·838	30·004	·985	·759	·635	·735	·780
8 „ - -	·745	·791	·720	·814	·608	·718	·842	·000	·983	·756	·634	·734	·779
10 „ - -	·740	·791	·713	·807	·602	·714	·840	·003	·983	·753	·633	·732	·776
Noon - -	·741	·790	·716	·804	·604	·714	·835	·003	·981	·757	·634	·728	·776
2 p.m. -	·744	·792	·721	·805	·611	·718	·840	·009	·980	·754	·639	·727	·778
4 „ - -	·745	·791	·723	·808	·618	·721	·846	·011	·980	·756	·642	·729	·781
6 „ - -	·744	·791	·723	·811	·625	·721	·843	·016	·981	·758	·645	·728	·782
8 „ - -	·740	·787	·725	·811	·627	·720	·841	·013	·983	·753	·643	·729	·781
10 „ - -	·735	·784	·723	·803	·625	·716	·832	·012	·978	·754	·644	·728	·778
Midnight - -	·733	·787	·719	·799	·625	·711	·827	·013	·975	·754	·639	·730	·776
Means - -	29·741	29·791	29·721	29·810	29·614	29·716	29·837	30·005	29·980	29·756	29·638	29·730	29·778

TABLE II.

MEAN TEMPERATURE OF THE AIR, at WELLINGTON CHANNEL, 1853 September, to 1854 August 23rd.

Hours.	1853.				1854.								
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Year.
2 a.m. - -	+15°·8	+8°·9	−7°·7	−14°·3	−17°·2	−23°·2	−20°·2	+0°·5	+7°·2	+27°·2	+36°·0	+34°·0	+3°·9
4 „ - -	15·9	9·1	8·1	14·3	17·5	23·2	20·7	0·1	7·3	27·5	36·2	33·6	3·8
6 „ - -	15·7	9·7	8·2	14·1	18·1	23·5	20·4	0·3	9·8	28·9	37·0	34·2	4·3
8 „ - -	15·9	10·1	8·1	13·8	17·7	22·8	20·2	2·4	11·5	30·8	38·0	35·2	5·1
10 „ - -	17·8	10·3	7·1	13·0	17·1	22·5	19·7	3·9	13·6	32·0	39·1	36·4	6·1
Noon - -	19·1	10·5	6·7	12·4	17·2	22·7	19·1	5·2	15·8	32·6	40·0	37·8	6·9
2 „ - -	19·6	10·4	7·0	12·9	17·8	22·3	18·8	5·8	17·7	32·9	40·5	38·5	7·2
4 „ - -	19·4	10·0	7·0	12·8	18·0	22·2	18·5	6·2	17·2	32·7	40·2	38·2	7·1
6 „ - -	18·3	9·2	7·0	13·0	17·1	21·1	18·3	5·8	15·2	31·8	39·2	38·0	6·7
8 „ - -	17·1	9·1	7·4	13·2	17·5	21·5	18·5	4·0	14·1	30·5	38·2	36·4	5·9
10 „ - -	15·8	9·1	7·8	13·6	17·5	21·5	19·2	2·3	11·6	29·3	37·2	35·4	5·1
Midnight - -	+15·2	+8·6	−7·7	−13·7	−18·0	−22·0	−20·0	+1·7	+9·4	+28·2	+36·2	+34·4	+4·4
Means - -	+17·1	+9·6	−7·5	−13·4	−17·6	−22·4	−19·5	+3·2	+12·5	+30·4	+38·1	+36·0	+5·5

Table III.

Mean Temperature at Wellington Channel, by Thermometer on Upper Deck, 1853 September, to 1854 August 23rd.

Hours.	1853. Sept.	Oct.	Nov.	Dec.	1854. Jan.	Feb.	March.	April.	May.	June.	July.	August.
2 a.m. -	+15°·8	Observations incomplete.	−5°·8	−11°·0	−13°·8	−18°·9	−17°·2	+2°·5	+8°·6	+27°·3	+36°·2	+33°·8
4 „ -	15·7		6·1	11·3	14·0	19·1	17·2	2·4	8·9	28·0	36·3	33·6
6 „ -	15·7		6·3	10·9	14·5	19·3	17·1	3·1	10·7	29·6	37·1	34·3
8 „ -	16·9		5·8	10·5	14·1	18·8	17·0	4·9	12·6	31·5	38·3	35·2
10 „ -	17·8		5·2	9·9	13·8	18·1	15·9	5·7	14·9	33·4	39·5	36·6
Noon -	19·1		4·9	9·7	13·9	18·5	15·2	6·6	16·6	33·4	40·3	38·2
2 p.m. -	19·6		5·3	9·9	14·1	18·6	14·9	7·4	16·8	33·8	40·5	38·3
4 „	19·4		5·6	10·1	14·5	18·6	14·5	8·0	17·4	33·4	40·1	37·8
6 „ -	18·5		5·0	9·5	14·2	17·8	14·8	7·6	16·3	32·8	39·1	37·9
8 „ -	17·1		5·0	9·6	13·9	17·2	15·0	5·9	14·9	31·4	38·0	36·5
10 „ -	15·8		5·6	9·9	14·2	17·7	16·0	4·7	12·5	29·7	37·3	35·6
Midnight. -	+15·2		−5·8	−10·3	−14·6	−17·8	−16·6	+3·7	+10·7	+28·2	+36·4	+34·3
Means -	+17·2		−5·5	−10·2	−14·1	−18·4	−15·9	+5·2	+13·4	+31·0	+38·3	+36·0

Table IV.

Mean Temperature of the Air, by a Thermometer on the Ice, at Wellington Channel, 1853 November, to 1854 June.

Hours.	1853. Nov.	Dec.	Jan.	1854. Feb.	March.	April.	May.	June.
2 a.m. -	−18°·8	−27°·8	−37°·1	−41°·0	−33°·9	−9°·6	+3°·3	+23°·8
4 „ -	18·4	27·5	37·6	41·2	34·3	−10·0	3·3	24·6
6 „ -	18·3	27·5	37·9	40·7	34·3	−9·3	7·0	26·1
8 „ -	18·2	27·5	37·8	40·7	33·4	−5·7	9·6	28·4
10 „ -	18·0	27·4	38·0	40·1	29·7	−2·2	12·5	30·4
Noon -	18·4	27·1	38·0	39·1	26·0	+0·5	14·3	31·9
2 „ -	18·8	27·0	38·1	38·9	24·4	+2·0	14·4	31·5
4 „ -	18·7	27·3	38·6	39·2	25·5	+0·9	14·4	30·7
6 „	18·9	27·7	38·9	39·5	28·9	−1·9	13·0	29·3
8 „ -	19·1	27·8	39·0	39·3	30·9	−5·6	11·2	28·1
10 „ -	19·4	27·8	38·9	39·4	32·5	−7·4	8·4	26·7
Midt. -	19·2	−27·5	−39·0	−39·8	−33·5	−8·6	+5·7	+25·1
Means	−18·7	−27·5	−38·2	−39·9	−30·6	−4·7	+9·8	+28·0

Note to Table IV.—The thermometer used on the ice was No. 2 until the 2nd of May; then No. 3, which was withdrawn July 22, "owing to the "difficulty in preventing its being influenced by the solar rays."

The mean temperature in the ice-house, at noon, was in April −5°·7, and in May, from 1st to 26th, 8°·8.

Table V.

Hygrometrical Results for September 1853, at Wellington Channel.

Hours.	Wet-Bulb.	Dew-point.	Vapour Tension.	Humidity.
2 a.m. -	15·2	13·6	·076	90
4 „ -	15·2	13·9	·077	92
6 „ -	14·9	12·7	·073	87
8 „ -	16·3	14·8	·080	90
10 „ -	17·4	16·5	·087	94
Noon -	18·5	17·2	·090	92
2 p.m. -	19·1	17·9	·093	92
4 „ -	18·9	17·7	·092	92
6 „ -	17·7	15·8	·084	88
8 „ -	16·3	14·2	·078	88
10 „ -	14·9	12·5	·072	86
Midt. -	14·3	11·6	·069	84
Means -	16·6	15·0	·081	90

Table VI.

Extremes of Atmospheric Pressure, with accompanying Temperature, Wind, and Weather, at Wellington Channel, 1853–4.

Month.	Date.	Highest.	Temp.	Wind.	Weather.	Date.	Lowest.	Temp.	Wind.	Weather.	Range.
	d. h.	inches.				d. h.	inches.				inch.
September 1853	27 8	29·99	+15°·5	Calm	o m	10 22	29·24	+13°·5	E. 1	b c	0·75
October „ -	10 2	30·27	+13·5	S.E. 2	b c	1 18	·27	+22·0	E.N.E. 7	c m q	1·00
November „ -	15 2	·18	−14·0	Calm	„	27 16	·27	−9·0	Calm	c o m	0·91
December „ -	28 20	·47	−24·0	„	b	31 12	·01	+20·0	E.N.E. 9	o m q	1·46
January 1854	8 18	29·98	−22·0	S.E. 1	b c	− 20	28·94	+18·0	E.N.E. 9	„	1·04
February „ -	24 12	30·00	−24·0	Calm	b m	18 16	29·02	−21·0	W.N.W. 3	b m	0·98
March „ -	25 8	·50	−18·0	S.W. 2	b	29 14	·16	−14·0	S.E. 3	b c	1·34
April „ -	10 8	·38	+ 1·0	S. 2	o m	− 14	·43	−24·0	„ 5	b	0·95
May „ -	30 4	·26	+30·0	E.N.E. 2	o	4 14	·42	+ 9·0	N.W. 3	o m	0·84
June „ -	3 6	·09	+35·0	N.N.W. 1	b c	9 14	·42	+30·0	S.E. 5	o m q	0·67
July „ -	6 8	29·83	+36·0	Calm	o m p	15 22	·32	+39·0	E.S.E. 7	o c q m	0·51
August „ -	16 2	·93	+34·5	N.W. 2	o c m	2 22	·38	+41·0	E. 6	o c	0·55
Year - -	Mar.	30·50	—	—	—	Jan.	28·94	—	—	—	1·56

Table VII.

Extremes of Air Temperature, with accompanying Pressure, Wind, and Weather, at Wellington Channel, 1853–4.

Month.	Date.	Highest.	Bar.	Wind.	Weather.	Date.	Lowest.	Bar.	Wind.	Weather.	Range.
	d. h.		inches.			d. h.		inches.			
September 1853	4 4	+34°·0	29·74	Calm	o c	29 8	+2°·0	29·89	E.S.E. 3	o c q	32°·0
October „ -	13 0	+26·5	·63	„	o m s	7 14	−9·0	·92	Calm	b c	35·5
November „ -	6 0	+9·0	·53	N.W. 1	c o m	24 10	−22·0	·92	E.N.E. 1	b	31·0
December „ -	31 12	+20·0	·01	E.N.E. 9	o m q	28 14	−27·0	30·42	Calm	„	47·0
January - 1854	1 0	+26·0	28·94	E.N.E. 4	„	28 8	−38·0	29·52	S.E. 1	b c	64·0
February „ -	28 6	−8·0	29·82	S. 1	b c	7 0	−38·0	·97	S.S.E. 3	o c	30·0
March - „ -	29 6	−6·0	·19	S.S.W. 2	o m	14 0	−34·0	·56	E. 1	b c	28·0
April „ -	22 0	+22·0	·98	Calm	o m s	— 16	−25·0	·46	S.E. 5	b	47·0
May „ -	25 2	+35·0	·74	„	o s	5 16	−9·5	·70	N.W. 2	b c	44·5
June „ -	25 22	+44·0	·67	„	b c	7 12	+18·0	·74	Calm	„	26·0
July „ -	19 2	+48·0	·75	E. 2	„	7 16	+32·0	·81	N.W. 1	o m s	16·0
August „ -	4 2	+48·0	·57	S.E. 3	„	18 16	+29·5	·85	Calm	b c	18·5
Year - -	—	+48·0	—	—	—	—	−38·0	—	—	—	86·0

Table VIII.

Mean Temperature of the Sea, at the Surface, in Wellington Channel, 1853–4.

Hours.	1853.			1854.				
	Sept.	Oct.	Nov. 1st to 6th.	April 17th to 30th.	May.	June.	July.	Aug.
2 a.m. - -	28°·9	28°·6	28°·5	—	—	—	—	—
4 „ - -	28·9	28·5	28·5	—	—	—	—	—
6 „ - -	28·9	28·6	28·5	—	—	—	—	—
8 „ - -	29·0	28·6	28·5	—	—	—	—	—
10 „ - -	29·0	28·6	28·5	—	—	—	—	—
Noon - -	29·0	28·7	28·5	29·5	29·5	31·5	33·0	32·4
2 p.m. - -	29·0	28·6	—	—	—	—	—	—
4 „ - -	29·0	28·6	—	—	—	—	—	—
6 - -	29·0	28·6	—	—	—	—	—	—
8 „ - -	29·0	28·6	—	—	—	—	—	—
10 „ - -	28·9	28·6	—	—	—	—	—	—
Midnight - -	28·9	28·6	—	—	—	—	—	—
Means - -	29·0	28·6	28·5	29·5	29·5	31·5	33·0	32·4

Table IX.

Sums of Wind Components, at Wellington Channel, 1853 September, to 1854 August 23rd.

Hours.	September 1853.				October 1853.				November 1853.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
2 a.m. -	5·3	26·7	16·1	23·6	5·7	36·3	38·4	21·2	10·8	40·6	19·7	7·6
4 „ -	3·5	27·4	15·3	30·8	5·9	38·4	36·5	18·8	11·0	41·6	17·4	11·7
6 „ -	6·9	23·2	12·0	19·1	7·1	29·6	35·7	17·4	12·2	42·3	12·9	10·4
8 „ -	7·8	24·0	6·2	24·3	6·2	23·3	30·7	7·9	9·1	37·5	16·7	9·0
10 „ -	8·6	27·2	7·9	30·4	6·9	23·3	25·5	9·4	8·9	39·4	17·8	6·4
Noon -	9·9	31·9	9·6	25·9	6·4	31·6	29·4	9·2	8·4	33·5	9·5	5·7
2 p.m. -	6·7	29·2	6·8	28·1	10·2	31·1	25·7	13·3	9·8	28·7	10·9	5·7
4 „ -	4·7	29·3	10·1	31·1	13·9	25·9	27·3	15·6	5·3	27·1	14·3	4·6
6 „ -	7·5	23·7	22·7	25·0	12·6	29·7	25·3	16·5	7·0	22·3	14·9	2·8
8 „ -	4·3	23·9	23·3	24·3	10·8	34·5	24·7	14·1	9·1	32·1	15·3	5·1
10 „ -	4·1	30·2	18·2	20·2	7·9	31·8	33·0	20·1	10·9	35·8	12·5	10·1
Midnight -	3·0	28·2	17·8	19·8	7·3	32·5	35·0	18·2	10·9	35·5	16·4	7·4
Means -	6·0	27·1	13·8	25·2	8·4	30·7	30·6	15·1	9·4	34·7	14·9	7·2

Table IX. (*continued*).

Sums of Wind Components, at Wellington Channel, 1853 September, to 1854 August 23rd—*cont.*

Hours.	December 1853.				January 1854				February 1854.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
2 a.m. -	2·3	39·2	30·5	2·8	5·9	15·7	17·2	3·9	0·4	38·7	11·2	3·6
4 „ -	0·9	40·0	27·4	2·1	5·2	14·8	18·4	3·5	1·1	33·3	10·6	4·3
6 „ -	1·6	37·7	20·9	2·8	9·9	16·5	16·7	2·8	2·9	33·8	11·2	4·0
8 „ -	2·7	41·0	25·6	6·7	7·5	17·3	16·9	2·1	3·0	38·6	10·7	4·0
10 „ -	2·0	35·1	30·8	3·1	8·0	17·5	13·5	1·8	2·1	32·0	11·9	4·3
Noon -	1·0	34·7	34·3	2·9	8·5	15·6	10·1	3·3	—	36·1	11·3	5·6
2 p.m. -	4·3	28·2	23·4	4·4	5·9	17·8	9·1	2·8	1·7	35·4	9·9	9·5
4 „ -	5·2	31·6	26·7	2·3	4·0	19·8	5·2	2·6	1·0	42·1	10·7	6·2
6 „ -	6·8	31·4	21·3	2·6	3·2	13·8	4·6	3·2	—	38·5	11·8	5·0
8 „ -	3·4	38·6	30·2	3·7	4·3	14·6	3·2	7·0	0·7	39·1	17·4	3·2
10 „ -	3·4	41·4	32·8	2·5	0·7	16·5	4·4	3·6	0·7	40·3	13·7	2·5
Midnight -	4·5	40·1	37·0	3·3	2·1	15·7	3·6	5·0	0·7	39·1	12·2	4·1
Means -	3·2	36·6	28·4	3·3	5·4	16·3	10·2	3·5	1·2	37·3	11·9	4·7

(*continued.*)

Hours.	March 1854.				April 1854.				May 1854.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
2 a.m. -	8·1	38·5	33·5	8·3	0·7	54·0	24·2	6·8	8·3	23·0	20·6	11·7
4 „ -	6·4	47·2	34·6	6·4	0·7	43·5	26·6	7·3	6·7	18·6	22·0	10·5
6 „ -	8·1	43·2	32·7	6·4	2·1	50·1	30·2	7·5	15·5	24·9	25·8	21·9
8 „ -	8·6	36·5	21·2	9·9	0·7	53·0	26·8	4·5	15·3	24·9	20·9	21·0
10 „ -	10·3	43·9	27·0	13·9	2·8	54·8	28·0	5·1	21·9	24·8	15·6	24·6
Noon -	9·9	37·1	27·8	17·4	6·7	67·5	24·2	12·7	29·6	21·7	16·4	25·1
2 p.m. -	9·5	26·9	22·5	11·0	6·7	46·5	20·0	10·9	21·4	25·5	17·6	25·4
4 „ -	7·6	27·6	42·0	11·5	5·9	49·7	23·1	11·1	19·4	26·3	16·0	19·8
6 „ -	9·0	23·4	30·8	11·5	4·9	50·9	25·1	8·8	21·6	15·7	14·7	17·1
8 „ -	9·9	22·3	41·2	9·2	5·3	58·8	30·4	9·6	23·9	20·0	16·7	22·7
10 „ -	5·5	44·6	33·3	4·4	3·5	54·6	29·3	6·0	14·4	24·0	12·8	21·5
Midnight -	7·4	45·5	29·3	5·2	5·7	53·7	25·9	6·3	16·5	29·6	21·5	15·1
Means -	8·4	36·4	31·3	9·6	3·8	53·1	26·2	8·1	17·9	23·2	18·4	19·7

Table IX. (*concluded*).

Sums of Wind Components, at Wellington Channel, 1853 September, to 1854, August 23rd—*cont.*

Hours.	June 1854.				July 1854.				August 1854.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
2 a.m. -	15·0	25·8	45·7	8·7	10·6	29·6	60·1	4·4	12·4	4·9	30·2	8·1
4 „ -	20·3	21·4	46·1	8·0	9·6	28·1	62·7	8·4	8·7	9·6	23·2	15·0
6 „ -	23·3	25·9	33·6	10·3	13·1	9·7	61·7	7·1	12·7	8·2	18·4	6·7
8 „ -	23·6	22·5	37·3	8·9	15·8	9·6	65·3	6·5	9·1	10·2	16·5	6·0
10 „ -	33·2	25·6	39·1	12·0	15·7	22·5	54·7	5·8	14·2	5·2	16·9	7·5
Noon -	41·0	26·4	37·7	12·1	13·7	19·6	52·4	6·8	16·5	3·7	17·6	10·1
2 „ -	42·2	20·2	37·5	13·9	11·5	18·6	44·7	2·6	21·5	3·7	16·6	9·5
4 „ -	41·2	21·5	41·8	12·3	14·4	20·2	49·2	4·6	22·5	5·8	17·0	10·1
6 „ -	40·9	26·6	36·6	12·7	12·6	19·5	46·7	6·2	24·1	4·9	18·2	9·8
8 „ -	33·2	26·7	34·0	16·2	15·8	22·0	53·7	6·0	22·0	6·0	20·0	9·6
10 „ -	31·4	22·6	37·6	17·1	9·5	21·9	48·7	4·7	17·7	6·3	20·2	9·2
Midnight -	27·7	21·7	40·7	15·3	11·4	23·7	59·6	4·6	14·2	4·9	26·2	12·9
Means -	31·1	23·9	39·0	12·3	12·8	20·4	55·0	5·6	16·3	6·1	20·1	9·5

Table X.

Sums of Wind Components, with Resultant Winds, at Wellington Channel, for the Year 1853 September, to 1854 August 23rd.

Hours.	Components.				Resultants.	
	N.	S.	E.	W.	Direction.	Force.*
2 a.m. - -	85·5	373·0	347·4	110·7	S. 39° E.	370
4 „ - -	80·0	363·9	340·8	126·8	S. 37 E.	355
6 „ - -	115·4	345·1	311·8	116·4	S. 40 E.	300
8 „ - -	109·4	338·4	294·8	110·8	S. 39 E.	294
10 „ - -	134·6	351·2	288·7	124·3	S. 37 E.	272
Noon - -	151·6	359·4	280·3	136·1	S. 35 E.	253
2 p.m. - -	151·4	311·8	244·7	137·1	S. 34 E.	193
4 „ - -	145·1	326·9	283·4	131·8	S. 40 E.	237
6 „ - -	150·2	300·4	272·7	121·2	S. 45 E.	213
8 „ - -	142·7	338·6	310·1	130·7	S. 42 E.	264
10 „ - -	109·7	370·0	296·5	121·9	S. 34 E.	315
Midnight -	111·4	370·2	325·2	117·2	S. 39 E.	332
Means - -	123·9	345·8	299·8	123·8	S. 39 E.	284

* These figures must be divided by 357 to get the mean force at the given hour.

Table XI.

Monthly Resultants of the Winds, in Wellington Channel.

Month.	Resultants.	
	Direction.	Force.*
September 1853 - -	S. 28° W.	0·80
October „ - -	S. 35 E.	0·90
November „ - -	S. 17 E.	0·89
December „ - -	S. 37 E.	1·35
January 1854 - -	S. 32 E.	0·42
February „ - -	S. 11 E.	1·32
March „ - -	S. 38 E.	1·14
April „ - -	S. 20 E.	1·75
May „ - -	S. 14 W.	0·18
June „ - -	N. 75 E.	0·93
July „ - -	S. 81 E.	1·61
August „ - -	N. 46 E.	0·64

* Force by Beaufort's scale.

Table XII.

Calms noted at Wellington Channel, 1853 September, to 1854 August 23rd.

Hours.	1853.				1854.								Year.
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	
2 a.m. - -	6	4	8	10	21	13	10	6	8	7	8	3	104
4 „ - -	6	2	8	9	20	14	8	5	9	7	6	4	98
6 „ - -	9	7	7	11	15	12	9	5	5	7	7	6	100
8 „ - -	10	10	6	7	15	9	9	8	6	9	5	6	100
10 „ - -	6	11	7	9	13	9	4	7	5	7	6	5	89
Noon - -	4	11	6	8	13	7	5	6	3	4	6	4	77
2 p.m. - -	5	7	9	11	13	6	9	10	6	4	8	5	93
4 „ - -	6	3	15	10	15	5	6	8	8	3	5	3	87
6 „ - -	4	2	16	9	18	10	11	9	10	0	6	5	100
8 „ - -	9	7	12	6	16	9	11	6	7	3	5	5	96
10 „ - -	8	8	10	10	18	8	14	7	6	4	8	5	106
Midnight - -	8	4	10	8	19	13	13	7	7	7	7	3	106
Mean - -	7	6	9	9	16	10	9	7	7	5	6	4	1156

Force 8 and upwards of the wind was noted as follows:—October 17 times, December 9, January 4, February 2, April 10, May 2, June 18, July 6

Table XIII.

Summary of Winds, referred to Sixteen Points, with Mean Force (Scale 0 to 12), Wellington Channel.

Months.	Total Observations.	N.		N.N.E.		N.E.		E.N.E.		E.		E.S.E.		S.E.		S.S.E.	
		O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.
1853.																	
September	360	8	1·2	10	1·4	7	1·0	2	2·0	19	2·7	20	2·5	18	2·8	19	2·7
October	372	14	1·8	6	2·2	26	1·6	6	3·5	18	2·4	16	5·7	63	3·7	10	4·2
November	360	12	2·3	15	2·3	14	2·0	3	1·0	3	1·0	3	3·0	32	3·3	39	3·7
December	372	2	1·5	1	1·0	—	—	7	7·4	4	4·7	13	2·4	84	2·8	60	3·4
1854.																	
January	372	9	2·6	—	—	—	—	6	7·7	3	1·7	1	1·0	33	1·9	49	1·6
February	336	5	1·6	—	—	—	—	2	2·0	1	2·0	2	2·5	46	2·3	43	4·0
March	372	4	2·5	—	—	5	1·8	3	2·0	9	3·6	30	4·7	59	3·4	43	3·6
April	360	2	1·0	3	2·7	10	3·3	3	2·7	13	2·4	3	1·3	87	3·0	43	3·6
May	372	27	3·0	2	2·0	8	2·0	2	2·0	13	2·5	19	4·0	41	3·1	6	4·5
June	360	33	2·8	6	4·0	9	4·2	7	5·1	44	4·5	13	4·9	37	4·1	24	3·6
July	372	32	1·3	3	2·3	35	2·6	15	5·0	82	3·9	28	3·5	31	4·4	8	5·6
August	276	39	1·6	—	—	1	2·0	5	6·0	39	3·6	16	3·6	8	3·1	—	—

(*continued.*)

Months.	S.		S.S.W.		S.W.		W.S.W.		W.		W.N.W.		N.W.		N.N.W.		Variable.		No. of Calms.
	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	
1853.																			
September	16	2·4	31	2·9	42	2·4	31	2·6	23	2·6	17	2·8	11	2·3	5	1·6	—	—	81
October	19	1·2	17	2·1	46	1·7	20	2·8	12	2·3	6	2·5	11	1·4	6	2·2	—	—	76
November	42	3·5	12	2·6	24	1·9	7	1·3	9	1·2	3	2·3	9	1·3	19	1·3	—	—	114
December	40	1·2	3	1·3	9	1·0	4	1·0	12	1·2	4	1·0	9	1·4	3	1·0	—	—	108
1854.																			
January	33	1·6	12	1·5	9	1·7	—	—	2	1·0	2	1·0	12	2·1	5	1·4	—	—	196
February	66	2·2	19	2·2	22	1·5	3	1·7	6	1·2	1	3·0	4	1·0	1	1·0	—	—	115
March	28	1·6	11	1·9	17	2·5	5	1·8	4	1·0	1	2·0	28	2·6	12	2·8	4	1·5	109
April	60	3·9	14	3·4	9	3·6	8	3·3	14	1·6	—	—	6	2·2	1	2·0	—	—	84
May	28	2·8	5	3·6	26	2·0	4	1·5	37	1·8	10	2·2	56	2·3	8	2·5	—	—	80
June	15	3·8	5	3·0	—	—	3	3·0	—	—	1	1·0	39	2·7	62	2·5	—	—	62
July	8	4·3	5	4·8	9	1·5	3	2·0	19	1·5	7	1·3	7	1·0	3	1·0	—	—	77
August	7	2·3	7	1·0	10	1·0	5	2·6	6	1·5	—	—	43	1·9	29	2·3	7	2·1	54

Table XIV.

Summary of Weather Notations, at Wellington Channel, 1853 September, to 1854 August 23rd.

Hours.	September 1853.								October 1853.								November 1853.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
2 a.m.	6	10	14	8	—	—	5	2	4	8	19	19	1	—	3	7	10	9	11	14	1	—	3	4
4 „	6	8	16	7	1	—	6	1	4	9	18	19	—	—	1	7	8	9	13	16	1	—	3	6
6 „	5	12	13	6	1	—	4	—	4	9	18	18	—	—	—	8	9	9	12	16	1	—	4	5
8 „	7	10	13	5	1	—	6	—	4	8	19	15	1	—	—	5	9	10	11	15	1	—	2	4
10 „	6	12	12	5	2	—	5	2	5	8	18	14	1	—	3	4	8	9	13	14	1	—	3	1
Noon	7	11	12	7	1	—	4	2	6	8	17	11	1	—	4	6	8	8	14	13	1	—	3	1
2 p.m.	9	11	10	5	1	—	4	2	3	10	18	14	—	—	4	4	7	8	15	15	1	—	3	—
4 „	8	11	11	7	—	—	5	2	4	10	17	13	1	—	4	3	7	8	15	16	1	—	4	—
6 „	8	11	11	8	—	—	3	1	3	10	18	15	—	—	5	4	7	12	11	16	1	—	3	3
8 „	7	12	11	8	—	—	5	4	6	5	20	17	1	—	4	6	8	14	8	18	—	—	2	2
10 „	7	11	12	7	—	—	5	4	3	7	21	19	2	—	5	6	9	13	8	19	—	—	1	4
Midt.	6	11	13	9	—	—	4	2	5	7	19	16	2	—	5	7	9	13	8	16	—	—	3	2
Means	6·8	10·9	12·3	6·8	0·6	—	4·7	1·8	4·3	8·2	18·5	15·8	0·8	—	3·2	5·6	8·2	10·2	11·6	15·7	0·7	—	2·8	2·7

(*continued.*)

Hours.	December 1853.								January 1854.								February 1854.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
2 a.m.	11	10	10	16	—	—	1	5	17	10	4	14	—	—	1	1	16	6	6	11	—	—	1	4
4 „	11	10	10	16	—	—	1	7	15	12	4	15	—	—	—	1	17	6	5	11	—	—	—	4
6 „	10	11	10	19	—	—	1	5	14	13	4	13	—	—	—	1	14	8	6	13	—	—	—	4
8 „	13	11	7	13	—	—	—	3	14	12	5	11	—	—	—	1	14	8	6	12	—	—	—	3
10 „	12	12	7	9	—	—	—	4	14	11	6	9	—	—	—	2	13	9	6	12	—	—	—	2
Noon	12	13	6	10	—	—	1	4	15	10	6	9	—	—	—	1	13	7	8	11	—	—	—	3
2 p.m.	12	10	9	7	—	—	1	4	14	10	7	8	—	—	1	—	12	11	5	10	—	—	—	3
4 „	9	13	9	13	—	—	—	3	15	10	6	10	—	—	—	—	13	10	5	8	—	—	1	2
6 „	9	13	9	14	—	—	—	2	14	12	5	13	—	—	1	—	14	11	3	11	—	—	1	2
8 „	14	12	5	14	—	—	1	5	14	9	8	12	—	—	—	1	14	9	5	12	—	—	1	1
10 „	14	11	6	14	—	—	1	7	15	10	6	14	—	—	—	—	14	9	5	10	—	—	1	4
Midt.	15	10	6	14	—	—	1	6	14	10	7	14	—	—	—	—	15	8	5	11	—	—	1	4
Means	11·8	11·4	7·8	13·2	—	—	0·7	4·6	14·6	10·7	5·7	11·8	—	—	0·2	0·7	14·1	8·5	5·4	11·0	—	—	0·5	3·0

TABLE XIV. (*concluded*).

SUMMARY OF WEATHER NOTATIONS, at WELLINGTON CHANNEL, 1853 September to 1854 August 23rd—*cont.*

Hours.	March 1854.								April 1854.								May 1854.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
2 a.m.	15	11	5	7	—	—	1	4	11	8	11	8	—	—	2	3	10	10	11	3	1	—	2	1
4 „	13	12	6	8	—	—	—	3	10	8	12	5	—	—	2	2	10	11	10	2	1	—	2	1
6 „	14	8	9	8	—	—	—	4	12	6	12	6	—	—	2	2	10	8	13	2	1	—	2	—
8 „	15	8	8	10	—	—	—	1	12	6	12	9	—	—	3	—	10	8	13	4	—	—	3	—
10 „	14	9	8	12	—	—	—	3	12	6	12	10	—	—	3	—	9	6	16	5	—	—	5	—
Noon	12	11	8	16	—	—	—	3	12	6	12	8	—	—	3	—	8	8	15	6	—	—	6	1
2 p.m.	11	10	10	16	—	—	—	1	15	6	9	4	—	—	2	—	7	6	18	5	—	—	4	2
4 „	10	10	11	18	—	—	—	3	13	7	10	2	—	—	2	2	8	6	17	5	—	—	5	2
6 „	11	8	12	20	—	—	—	2	14	6	10	2	—	—	2	2	9	7	15	4	—	—	2	1
8 „	15	6	10	16	—	—	—	1	15	5	10	5	—	—	2	1	9	7	15	3	—	—	3	1
10 „	15	10	6	13	—	—	—	3	16	6	8	5	—	—	2	1	8	9	14	1	—	—	3	1
Midt.	15	10	6	12	—	—	—	2	15	9	6	6	—	—	3	1	9	9	13	4	—	—	1	1
Means	13·3	9·4	8·3	13·0	—	—	0·1	2·5	13·1	6·6	10·3	5·8	—	—	2·3	1·2	8·9	7·9	14·2	3·7	0·2	—	3·2	0·9

(*continued.*)

Hours.	June 1854.								July 1854.								August 1854.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	h.	s.	q.
2 a.m.	5	11	14	7	1	—	3	12	3	13	15	7	—	1	2	11	5	9	9	4	3	—	1	1
4 „	6	12	12	7	1	—	3	8	4	11	16	10	—	2	2	9	7	9	7	4	1	—	1	2
6 „	9	10	11	6	—	—	4	6	5	11	15	5	—	2	2	9	7	9	7	3	3	1	1	2
8 „	10	12	8	5	—	—	4	8	5	10	16	7	—	2	3	8	7	9	7	3	3	1	—	1
10 „	9	11	10	6	—	—	3	7	4	11	16	8	—	4	2	7	6	8	9	2	5	1	—	1
Noon	7	13	10	6	—	1	4	8	5	11	15	9	—	2	1	7	7	10	6	2	4	—	—	2
2 p.m.	6	13	11	6	—	—	5	9	5	15	11	5	1	4	—	5	7	9	7	2	4	—	—	1
4 „	5	12	13	7	—	—	5	9	5	15	11	6	1	4	—	5	6	8	9	1	6	—	—	1
6 „	5	9	16	4	—	—	2	10	5	16	10	6	1	3	1	7	6	7	10	2	6	—	—	1
8 „	7	9	14	7	—	—	3	12	6	15	10	5	1	2	1	7	5	6	12	4	6	—	—	1
10 „	5	10	15	6	—	—	2	12	4	14	13	5	2	—	1	8	5	10	8	4	5	—	—	2
Midt.	7	11	12	8	—	1	2	12	4	12	15	6	1	1	1	7	5	9	9	5	3	—	1	2
Means	6·7	11·1	12·2	6·2	0·2	0·2	3·3	9·4	4·6	12·8	13·6	6·6	0·6	2·2	1·3	7·7	6·1	8·6	8·3	3·0	4·1	0·2	0·3	1·4

REMARKS from the ADMIRALTY LOG of H.M.S. "ASSISTANCE."

1853.—SEPTEMBER.

1st - - Abreast of Cape Simkinson. Numerous lanes of water to Sd. and Ed.
3rd - - A bear seen.
6th - - Secured to grounded ice.
12th - - Shot a hare. Thickness of ice under the stern 9¾ inches.

OCTOBER.

9th - - A fox seen.
11th - - Water about 50 yards from ship; ice broke up round the ship.
12th, 6 a.m. - No ice in sight, except the grounded ice near the shore. At noon, pack in sight bearing N.W. (mag.) distant 3 miles. A slight swell from Sd.
13th - - Secured to grounded ice.
17th - - Young ice strong enough to bear.
20th - - Ice pressing upon the shore, with a loud noise.

NOVEMBER.

1st - - Thickness of floe 20 inches alongside the ship, and 18 inches 100 yards from the shore.
28th, 5 p.m. - Faint aurora N.E. (mag.).

DECEMBER.

1st, 6.40 p.m. - Aurora extending from N.N.W. to S.S.E., passing through the zenith.
7th, 2 a.m. - Aurora in N.E., extending from zenith to horizon.
25th - - Aurora in N.W.
27th, 2 to 3 a.m. - Floe making a loud cracking noise.
28th, 6 a.m. - Aurora from N.W. to S.E., passing through zenith.

1854.—JANUARY.

1st, 2 a.m. - Faint aurora Sd.
5th - - A wolf seen.
14th - - Thickness of floe 4 feet 3½ inches.
19th - - Thermometer No. 480 broken in icehouse.
25th - - Thickness of floe 4 feet 6 inches.
30th, 3 a.m. - Aurora from N.W. to S.E.

FEBRUARY.

3rd - - Thickness of floe 4 feet 11 inches.
14th - - Thickness of floe 5 feet 10 inches.
27th, 28th - A wolf seen.

MARCH.

2nd - -	Wolf seen; also on 3rd, 4th, 17th, 21st, 27th, and 28th.
5th - -	Thickness of floe 5 feet 2 inches. 10 to 12 p.m., aurora extending N. and S.
7th, 11 p.m. -	Faint aurora extending N. and S.
8th - -	A raven seen flying over the ship.
11th - -	Two ravens seen flying over the ship.
14th - -	Thickness of floe 5 feet 5 inches.
22nd - -	Shot a hare, weighing 10 lbs.
24th - -	Thickness of floe 5 feet 8 inches.
25th - -	Thickness of floe 5 feet 7 inches.

APRIL.

2nd, - -	Wolf seen; also on 4th, 27th, and 28th.
20th - -	An extraordinary mirage from S.E. to N.
21st - -	Two hares shot.
27th - -	Three or four snow-buntings.
30th - -	Hare shot.

MAY.

3rd - -	Two ptarmigans seen.
6th - -	A bear seen.
9th, 17th, 18th -	Wolf seen.
28th - -	Snow-buntings round the ship. A flock of birds flying southward.
30th - -	A seal and a snow-bunting seen.
31st - -	Two ptarmigans, a snow-bunting, a raven, and a flock of birds seen.

JUNE.

1st - -	Two ptarmigans seen.
2nd - -	A bear and two cubs seen.
4th - -	A burgomaster seen.
5th - -	Snow-buntings seen.
9th - -	Two flocks of geese going to Nd. and Wd.
12th - -	Two burgomasters seen.
15th - -	A flock of birds going Sd.
17th - -	Two ducks flying Nd.
18th - -	An ivory gull shot; another on 21st.
22nd - -	Two ravens and two gulls seen.
23rd, 27th -	Wolf seen.
25th - -	An ivory gull shot. Two terns seen.
26th - -	Six brent geese seen; also several ducks and ivory gulls. The first flower was this day seen on shore.
27th - -	An ivory gull shot.
28th - -	Several geese seen.
29th - -	Several ducks and gulls seen
30th - -	Several ducks, geese, and terns seen.

JULY.

1st - -	A raven and several gulls seen.
2nd - -	Several gulls seen.
3rd - -	Several ducks seen.
4th - -	Several ivory gulls seen; also a fox with a black face, legs, and brush.
5th - -	Several ivory gulls, terns, and ducks seen.
6th - -	Several ivory gulls seen.
7th - -	A seal shot.
9th - -	Several dovekies flying Nd.
11th - -	A flock of looms flying Nd., and several ivory gulls.
15th - -	Several gulls about.
23rd - -	Two wolves seen.
26th - -	A bear and two cubs killed: old bear, 6 ft. 6 in. over all, 436 lbs. female cub, 4 ft. 8 in. „ 180 lbs. male cub, 4 ft. 10 in. „ 189 lbs.
31st - -	Ice 12 feet thick.

AUGUST.

8th - -	Thickness of floe 5½ feet.

No. XII.

Results of the Wind and Weather Observations at Northumberland Sound and at Wellington Channel.—H.M.S. "Pioneer."

NORTHUMBERLAND SOUND.

The observations of the winds and the weather made on board H.M.S. "Pioneer" in Northumberland Sound 1852–3, and in Wellington Channel 1853–4, have been discussed for the purpose of comparison with those of H.M.S. "Assistance." The results, deduced from the observations made in Northumberland Sound, are contained in Tables I. to VI.

Table I. gives the two-hourly sums of wind components in each month.

Table II. sums up the two-hourly components for the entire year, and from them the resultants of the wind have been deduced. It will be seen that the "Pioneer" agrees so far with the "Assistance" that the range of wind direction is much the same; that there is no remarkable difference between the resultant directions, but the agreement is not so good for the resultant force, consequent apparently on the fact that the "Pioneer" gives the wind a greater westerly component than the "Assistance" does. On the whole the comparison is highly satisfactory.

Table III. shows the monthly resultants of the winds as deduced from the means of the components in Table I. These compared with those for the "Assistance," agree very closely for November, March, April, May, June, and August; for October, December, January, and July they differ considerably as to direction, and for September they differ widely. Perhaps the differences are not more than might be expected, except in the case of September. The mean forces seem to agree tolerably well.

Table IV. shows the numbers of calms noted in each month grouped under the hours of observation. On the whole, the "Pioneer" recorded 832 calms against 889 by the "Assistance," so that there is not much difference in the total notations of calms observed on board the two ships, but their distribution over the months and the hours is often very different. Any conclusions as to the hours favourable to calms from one register is upset by the other. Thus the most frequent calms were noted by "Pioneer" at 8 and 10 p.m., by "Assistance" 4 a.m.; least frequent, "Pioneer" 8 a.m., "Assistance" 6 p.m., The days of calms agree very closely for all months except September.

Table V. comprises the monthly summaries of the wind observations, with the mean force. These will be found to agree substantially with those of the "Assistance."

Table VI. furnishes the two-hourly notations of the weather. These, compared with the similar table for the "Assistance," prove that the "Pioneer" recorded mist in the winter months much more frequently than the "Assistance," and squalls less frequently. In other respects the two accounts are not materially different.

TABLE I.

SUMS OF WIND COMPONENTS, at NORTHUMBERLAND SOUND, H.M.S. "PIONEER," 1852 September, to 1853 August.

Hours.	September 1852.				October 1852.				November 1852.			
	N.	S.	E.	W.	N	S.	E.	W.	N.	S.	E.	W.
2 a.m. -	34·1	27·2	20·4	43·4	27·4	21·0	13·2	33·8	19·5	42·7	51·8	5·7
4 „ -	35·0	29·2	18·9	44·2	29·2	18·8	9·6	33·5	18·3	41·3	48·4	6·0
6 „ -	35·1	30·1	18·7	33·1	26·9	13·9	6·7	32·5	18·1	41·3	46·6	8·2
8 „ -	32·8	26·9	18·5	31·6	27·0	14·8	5·1	29·4	12·3	36·6	44·0	11·7
10 „ -	29·3	23·7	18·9	29·3	27·4	13·2	5·4	27·1	11·6	32·8	43·0	11·2
Noon -	31·2	27·8	26·5	30·9	28·1	13·2	5·4	29·7	19·0	31·8	45·8	10·3
2 p.m. -	29·5	28·7	22·4	32·8	21·8	12·8	5·3	32·8	20·4	33·0	48·4	7·8
4 „ -	31·7	27·3	25·2	28·1	25·2	11·9	6·2	36·4	19·0	29·9	48·2	6·2
6 „ -	30·9	24·8	27·8	29·3	23·0	9·5	10·4	37·0	21·8	32·0	45·1	8·8
8 „ -	30·1	26·5	22·2	27·7	22·3	11·7	10·7	35·9	27·0	34·2	53·4	7·0
10 „ -	29·9	26·0	23·9	35·0	21·2	13·4	11·0	31·9	21·8	41·5	53·7	7·2
Midnight -	32·0	27·5	28·2	36·5	23·6	18·1	15·4	30·6	23·2	44·6	50·0	6·5
Means -	31·8	27·1	22·6	33·5	25·3	14·4	8·7	32·5	19·3	36·8	48·2	8·0

(*continued*).

Hours.	December 1852.				January 1853.				February 1853.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
2 a.m. -	26·2	21·3	17·3	17·9	13·1	20·6	23·8	11·2	24·0	12·9	12·7	21·2
4 „ -	22·2	24·0	17·7	15·8	12·6	19·6	24·2	10·8	24·6	13·9	18·7	14·7
6 „ -	21·0	24·0	20·4	13·9	7·1	21·4	25·1	9·6	17·1	14·5	21·0	22·1
8 „ -	17·2	22·1	21·8	13·4	9·8	23·5	27·7	10·2	18·8	19·6	17·1	22·7
10 „ -	15·3	22·6	20·3	13·9	11·0	30·4	33·0	12·7	23·3	18·1	22·9	19·9
Noon -	19·6	21·7	20·4	16·6	11·3	28·5	31·9	15·3	23·1	18·1	19·0	16·9
2 p.m. -	13·2	19·2	17·7	12·2	11·0	23·8	28·9	15·8	21·2	14·6	15·4	13·3
4 „ -	18·6	18·5	17·1	14·7	12·6	24·3	29·2	16·0	22·2	13·8	14·8	12·8
6 „ -	16·7	19·6	18·9	15·0	14·0	22·0	28·2	13·5	21·3	15·1	17·7	11·7
8 „ -	15·3	21·0	20·2	9·7	14·3	17·8	23·1	13·0	19·6	16·0	17·6	12·9
10 „ -	20·5	21·8	25·7	11·7	14·0	17·6	20·0	14·9	17·3	14·7	14·1	19·4
Midnight -	23·9	23·1	20·4	17·0	14·4	19·9	23·8	14·5	20·5	10·7	10·5	24·3
Means -	19·1	21·6	19·8	14·3	12·1	22·4	26·6	13·1	21·1	15·2	16·8	17·7

TABLE I. (*concluded.*)

SUMS OF WIND COMPONENTS, at NORTHUMBERLAND SOUND, H.M.S. "PIONEER," 1852 September, to 1853 August—*cont.*

Hours.	March 1853.				April 1853.				May 1853.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
2 a.m. -	15·4	36·1	37·6	7·6	37·9	2·8	5·5	18·8	25·7	4·7	4·5	13·0
4 „ -	16·6	37·7	37·2	11·7	34·3	4·6	9·5	19·1	25·5	8·5	5·5	11·2
6 „ -	17·4	40·0	34·8	10·4	29·7	2·2	10·3	15·0	25·9	6·9	5·7	12·6
8 „ -	18·6	40·7	36·0	8·6	32·0	2·1	8·4	12·5	23·2	5·4	5·2	13·0
10 „ -	16·5	38·4	31·0	10·9	37·4	2·1	10·3	14·7	25·9	5·6	3·4	14·4
Noon -	15·7	41·4	34·4	12·2	32·5	1·0	9·1	10·1	25·5	4·8	1·5	15·8
2 p.m. -	13·4	38·7	33·6	9·8	32·7	1·8	7·1	10·9	27·9	4·7	3·3	12·2
4 „ -	11·4	36·7	31·5	8·9	37·8	2·8	10·4	12·0	28·1	5·4	4·3	15·1
6 „ -	12·3	35·4	34·5	8·7	40·9	4·8	8·6	13·7	30·1	7·2	4·4	12·5
8 „ -	15·8	35·3	35·2	12·8	32·4	3·5	5·3	14·0	32·7	9·9	4·9	12·4
10 „ -	15·5	35·0	34·6	9·6	34·5	2·1	4·5	15·1	31·5	7·6	2·9	13·9
Midnight -	17·3	35·4	36·4	9·5	42·5	2·8	7·3	18·2	27·5	5·4	6·1	13·8
Means -	15·5	37·6	34·7	10·1	35·4	2·7	8·0	14·5	27·5	6·3	4·3	13·3

(*continued.*)

Hours.	June 1853.				July 1853.				August 1853.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
2 a.m. -	29·7	24·2	18·0	11·7	12·6	38·1	20·8	19·2	17·4	25·2	45·0	21·3
4 „ -	31·8	24·4	17·0	12·6	11·8	35·8	21·8	16·5	15·5	17·9	38·1	22·8
6 „ -	32·2	26·2	18·5	9·0	12·9	36·1	21·4	14·2	14·4	19·0	34·8	22·7
8 „ -	28·9	26·3	15·7	11·7	11·9	35·5	21·7	16·0	19·0	19·9	33·9	23·3
10 „ -	32·3	25·3	14·3	14·9	9·6	35·7	24·7	15·3	15·7	22·3	30·1	24·9
Noon -	34·5	27·1	15·0	19·0	11·8	39·7	24·9	14·6	17·2	20·6	23·5	25·3
2 p.m. -	35·9	24·6	10·2	19·1	13·2	39·8	25·4	19·4	21·6	17·1	29·6	28·1
4 „ -	34·9	22·8	13·8	22·0	14·6	38·0	29·3	20·1	25·4	16·2	28·9	26·0
6 „ -	34·2	21·4	13·7	21·1	12·2	43·8	26·3	18·3	17·4	28·3	26·3	25·4
8 „ -	28·9	19·9	11·1	14·9	13·6	43·0	28·5	17·5	18·5	32·9	31·7	27·5
10 „ -	27·3	19·7	13·6	14·3	12·5	42·9	27·4	18·2	17·8	34·3	40·2	26·9
idnight -	30·3	23·0	14·4	13·6	11·9	39·6	22·9	15·9	18·6	30·0	41·6	23·0
Means -	31·7	23·7	14·6	15·3	12·4	39·0	24·6	17·1	18·2	23·6	33·6	24·8

TABLE II.

SUMS OF WIND COMPONENTS AND RESULTANT WINDS, at NORTHUMBERLAND SOUND, H.M.S. "PIONEER," 1852 September to 1853 August.

Hours.	Components.				Resultants.	
	N.	S.	E.	W.	Direction.	Force.*
2 a.m. -	283·0	276·8	270·6	224·8	N. 82° E.	46
4 „ -	277·4	275·7	266·6	218·9	N. 88 E.	48
6 „ -	257·8	275·6	264·0	203·3	S. 74 E.	61
8 „ -	251·5	273·4	255·1	204·1	S. 67 E.	56
10 „ -	255·3	270·2	257·3	209·2	S. 73 E.	50
Noon -	269·5	275·7	257·4	216·7	S. 81 E.	41
2 p.m. -	261·8	258·8	247·3	214·2	N. 85 E.	33
4 „ -	281·5	247·6	258·9	218·3	N. 50 E.	53
6 „ -	274·8	263·9	261·9	215·0	N. 77 E.	48
8 „ -	270·5	271·7	263·9	205·3	S. 89 E.	59
10 „ -	263·8	276·6	271·6	218·1	S. 77 E.	55
Midt. -	285·7	280·1	277·0	223·4	N. 84 E.	54
Means -	269·4	270·4	262·5	214·2	S. 89 E.	48

* These figures must be divided by 365 to get the mean force at the given hour.

TABLE III.

MONTHLY RESULTANTS OF THE WIND, at NORTHUMBERLAND SOUND, H.M.S. PIONEER," 1852 September, to 1853 August.

Months.	Resultants.	
	Direction.	Force.†
September 1852 -	N. 66° W.	0·40
October „ -	N. 65 W.	0·85
November „ -	S. 67 E.	1·47
December „ -	S. 66 E.	0·19
January 1853 -	S. 53 E.	0·55
February „ -	N. 9 W.	0·21
March „ -	S. 48 E.	1·06
April „ -	N. 11 W.	1·11
May „ -	N. 23 W.	0·74
June „ -	N. 5 W.	0·27
July „ -	S. 16 E.	0·89
August „ -	S. 58 E.	0·34

† In grades of Beaufort's scale.

TABLE IV.

CALMS NOTED AT NORTHUMBERLAND SOUND, H.M.S. "PIONEER," 1852 September, to 1853 August.

Hours.	1852.				1853.								Year.
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June	July.	Aug.	
2 a.m. - - -	1	4	5	6	6	8	7	5	10	1	6	6	65
4 „ - - -	1	4	6	5	6	9	8	8	9	4	5	4	69
6 „ - - -	2	3	5	5	8	8	7	9	9	2	7	5	70
8 „ - - -	2	3	5	6	6	2	8	9	12	3	5	2	63
10 „ - -	4	4	6	10	3	2	8	6	11	2	6	3	65
Noon - - -	1	2	7	7	1	3	7	13	10	4	5	5	65
2 „ - - -	1	3	6	10	5	9	8	10	10	2	3	4	71
4 „ - - -	2	4	6	10	8	11	10	7	8	2	4	3	75
6 „ - - -	1	2	7	10	10	8	10	5	8	1	4	4	70
8 „ - - -	3	2	6	9	11	11	7	7	9	2	3	4	74
10 „ - - -	2	1	8	9	10	10	6	8	10	2	4	4	74
Midnight - - -	1	1	7	8	8	10	7	5	11	3	6	4	71
Means - - -	2	3	6	8	7	8	8	8	10	2	5	4	832

Force 8 and upwards was noted as follows:—In September 17 times, November 21, January 2, March 14, May 1, July 2, August 2.

Table V.

Summary of Winds, referred to Sixteen Points, with Mean Force (Scale 0 to 12), at Northumberland Sound, H.M.S. "Pioneer."

Months.	Total Observations.	N.		N.N.E.		N.E.		E.N.E.		E.		E.S.E.		S.E.		S.S.E.	
		O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.
1852.																	
September	360	14	2·8	34	5·8	3	1·3	—	—	—	—	17	4·4	49	3·3	7	3·7
October	372	20	2·0	4	2·2	15	2·0	13	3·8	3	1·3	1	1·0	7	2·4	12	3·8
November	360	15	2·4	14	2·9	26	3·2	6	2·8	5	1·8	32	3·5	115	4·4	12	3·2
December	372	20	1·6	14	2·9	8	2·1	7	1·0	2	1·0	5	4·2	41	4·3	35	3·8
1853.																	
January	372	10	1·5	12	1·6	6	1·7	6	1·3	9	1·9	16	4·2	89	3·3	12	2·2
February	336	4	3·7	16	2·4	16	2·3	6	2·7	5	3·6	3	2·7	48	2·7	22	3·2
March	372	18	2·6	10	2·3	12	1·5	—	—	1	2·0	13	3·5	92	4·9	26	3·5
April	360	66	2·3	15	2·7	17	3·3	2	3·5	5	1·8	—	—	10	3·5	1	2·0
May	372	56	2·9	15	1·6	27	1·6	4	1·0	—	—	1	1·0	3	1·0	8	1·8
June	360	28	1·9	12	2·3	82	2·4	6	2·0	2	2·0	1	2·0	2	2·0	6	2·3
July	372	6	1·3	2	3·5	6	2·0	6	2·0	9	2·1	14	2·9	68	3·1	43	3·8
August	372	15	2·6	14	2·8	17	2·6	14	3·1	27	3·5	31	2·7	55	3·3	16	2·6

(*continued.*)

Months.	S.		S.S.W.		S.W.		W.S.W.		W.		W.N.W.		N.W.		N.N.W.		Variable.		No. of Calms.
	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	
1852.																			
September	9	2·9	14	3·1	43	2·3	20	2·7	16	2·7	48	2·9	55	2·1	10	2·4	—	—	21
October	23	2·0	15	2·2	23	1·7	12	2·9	36	2·6	49	2·1	78	1·8	28	2·9	—	—	33
November	1	2·0	—	—	2	2·0	1	3·0	2	3·5	18	1·6	23	2·6	14	2·9	—	—	74
December	—	—	—	—	—	—	—	—	2	2·0	46	2·0	50	2·0	29	1·4	18	1·1	95
1853.																			
January	1	2·0	2	1·5	5	1·0	2	2·0	10	2·2	29	1·8	56	1·9	7	1·3	18	1·0	82
February	6	3·2	—	—	2	1·0	4	1·2	8	1·8	21	2·6	77	2·5	5	2·6	2	1·0	91
March	18	1·7	1	3·0	—	—	—	—	3	2·0	29	2·0	35	1·7	20	2·2	1	2·0	93
April	2	1·5	—	—	1	2·0	2	2·5	4	1·5	6	1·3	108	1·7	29	2·0	—	—	92
May	22	1·7	7	2·1	5	1·8	5	1·6	16	1·8	17	2·5	48	1·7	21	2·3	—	—	117
June	54	4·4	5	2·0	14	1·9	3	1·3	24	1·3	14	2·1	39	2·3	40	2·2	—	—	28
July	27	3·0	12	3·5	19	1·8	7	2·3	24	1·3	25	2·3	36	2·1	9	5·1	1	1·0	58
August	9	1·9	10	2·2	17	1·9	12	2·9	36	3·0	20	2·7	24	3·2	7	3·0	—	—	48

Table VI.

Weather Notations, at Northumberland Sound, H.M.S. "Pioneer," 1852 September, to 1853 August.

Hours.	September 1852.								October 1852.								November 1852.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
2 a.m.	2	11	17	6	2	—	8	1	1	9	21	17	1	—	3	—	5	12	13	15	2	—	2	5
4 „	2	9	19	7	2	—	8	1	1	8	22	16	1	—	2	—	5	13	12	16	2	—	2	4
6 „	2	6	22	8	1	—	9	1	1	14	16	18	1	—	1	—	5	15	10	18	2	—	1	5
8 „	2	6	22	8	1	—	9	1	2	13	16	18	1	—	1	1	5	15	10	18	2	—	1	6
10 „	2	8	20	11	1	—	6	3	3	11	17	16	2	—	1	3	4	15	11	18	2	—	1	5
Noon	3	11	16	8	1	—	5	2	3	10	18	20	1	—	1	1	4	15	11	18	2	—	1	5
2 p.m.	2	13	15	9	2	—	6	2	3	11	17	19	—	—	—	—	4	15	11	20	2	—	2	5
4 „	3	11	16	8	2	—	7	2	3	12	16	18	—	—	1	—	5	13	12	18	2	—	2	4
6 „	3	11	16	6	2	—	7	2	2	14	15	18	—	—	1	—	5	12	13	14	3	—	—	5
8 „	3	11	16	6	2	—	8	2	1	14	16	19	—	—	1	1	5	13	12	16	3	—	—	6
10 „	3	11	16	5	2	—	10	2	2	12	17	20	—	—	2	1	5	12	13	17	2	—	1	8
Midnt.	3	10	17	6	1	—	7	1	2	10	19	22	—	—	3	—	5	12	13	17	2	—	1	8
Means	2·5	9·8	17·7	7·3	1·6	—	7·5	1·7	2·0	11·5	17·5	18·4	0·6	—	1·4	0·6	4·8	13·5	11·7	17·1	2·2	—	1·2	5·5

(*continued.*)

Hours.	December 1852.								January 1853.								February 1853.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
2 a.m.	13	18	—	15	—	—	—	—	8	14	9	27	—	—	—	—	12	10	6	18	1	—	—	2
4 „	13	18	—	13	—	—	—	—	9	14	8	26	—	—	—	—	11	9	8	19	1	—	—	2
6 „	13	18	—	14	—	—	—	—	10	13	8	24	1	—	—	—	12	9	7	18	1	—	1	3
8 „	12	19	—	14	—	—	—	1	10	14	7	25	1	—	—	1	12	10	6	17	1	—	1	4
10 „	13	18	—	14	—	—	—	1	10	13	8	26	1	—	—	1	14	9	5	18	—	—	—	5
Noon	13	18	—	15	—	—	—	1	10	12	9	26	1	—	—	1	15	9	4	16	—	—	—	3
2 p.m.	13	18	—	13	—	—	—	1	11	12	8	27	—	—	—	1	16	8	4	16	1	—	—	4
4 „	14	17	—	12	—	—	—	1	10	12	9	28	—	—	—	1	15	8	5	16	1	—	—	4
6 „	14	17	—	12	—	—	—	1	10	12	9	29	—	—	1	—	14	9	5	17	—	—	—	3
8 „	15	16	—	12	—	—	—	1	9	13	9	29	—	—	1	—	13	12	3	18	—	—	—	3
10 „	15	16	—	12	—	—	—	1	9	13	9	29	—	—	1	—	12	13	3	21	—	—	—	3
Midnt.	13	18	—	16	—	—	—	1	9	12	10	29	—	—	—	—	12	13	3	20	—	—	—	2
Means	13·4	17·6	—	13·3	—	—	—	0·7	9·6	12·8	8·6	27·1	0·3	—	0·2	0·4	13·2	9·9	4·9	17·8	0·5	—	0·2	3·2

Table VI. (*concluded*).

Weather Notations, at Northumberland Sound, H.M.S. "Pioneer," 1852 September to 1853 August—*cont.*

Hours.	March 1853.								April 1853.								May 1853.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
2 a.m.	4	15	12	22	1	—	—	4	8	15	7	15	—	—	5	7	8	11	12	9	—	—	5	1
4 „	6	15	10	21	1	—	—	4	7	15	8	16	—	—	6	6	7	13	11	12	—	—	7	1
6 „	7	13	11	19	1	—	—	3	8	15	7	17	—	—	6	5	7	13	11	13	—	—	8	1
8 „	8	14	9	17	3	—	1	4	8	14	8	16	—	—	5	3	6	15	10	12	2	—	6	1
10 „	8	14	9	17	3	—	1	4	8	14	8	16	—	—	5	4	7	13	11	12	2	—	6	1
Noon	9	12	10	17	3	—	1	3	8	14	8	16	—	—	4	4	8	12	11	9	2	—	5	—
2 p.m.	9	9	13	16	3	—	1	2	7	15	8	17	—	—	4	3	7	13	11	9	2	—	3	—
4 „	11	9	11	15	2	—	—	3	8	15	7	14	—	—	4	4	7	12	12	10	—	—	5	1
6 „	10	9	12	16	2	—	1	2	8	14	8	15	—	—	3	5	6	12	13	11	—	—	4	1
8 „	9	10	12	18	2	—	2	3	9	15	6	14	—	—	4	2	6	11	14	8	—	1	5	1
10 „	8	12	11	20	2	—	2	3	10	14	6	14	—	—	4	2	6	11	14	8	—	—	5	1
Midt.	6	12	13	19	2	—	1	3	9	15	6	15	—	—	4	5	7	13	11	10	—	—	4	1
Means	7·9	12·0	11·1	18·1	2·1	—	0·8	3·2	8·2	14·6	7·2	15·4	—	—	4·5	4·2	6·8	12·4	11·8	10·2	0·7	0·1	5·2	0·8

(*continued.*)

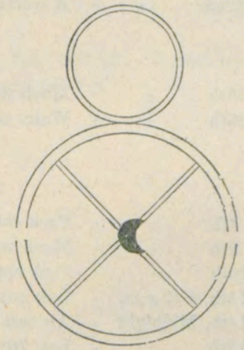
Hours.	June 1853.								July 1853.								August 1853.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
2 a.m.	5	10	15	9	—	—	6	3	3	15	13	7	6	4	2	—	3	8	20	6	8	2	6	—
4 „	4	9	17	10	2	—	5	2	3	14	14	8	6	3	3	—	3	8	20	7	7	2	7	—
6 „	4	10	16	10	2	—	5	2	4	13	14	7	9	2	1	—	3	8	20	7	5	2	6	—
8 „	5	11	14	10	3	1	4	2	4	11	16	8	9	4	1	—	3	7	21	9	4	3	6	—
10 „	5	11	14	12	3	1	2	2	3	13	15	9	10	2	2	—	3	7	21	8	7	5	7	—
Noon	6	7	17	8	3	—	5	3	3	15	13	9	7	5	1	—	3	7	21	9	7	4	5	—
2 p.m.	6	10	14	7	4	—	5	3	4	14	13	10	4	4	3	—	4	10	17	11	5	3	3	—
4 „	6	9	15	5	2	—	5	1	6	13	12	7	3	4	2	—	4	9	18	12	4	5	1	—
6 „	5	10	15	7	1	—	5	1	6	11	14	7	3	5	1	—	4	7	20	8	5	2	2	—
8 „	5	13	12	8	1	—	3	—	5	13	13	7	3	3	1	—	3	7	21	8	5	2	3	—
10 „	5	13	12	7	1	—	4	—	5	11	15	5	6	3	1	—	3	7	21	8	6	2	4	—
Midt.	5	9	16	8	1	—	6	3	4	13	14	8	4	2	2	—	3	8	20	8	6	1	5	—
Means	5·1	10·2	14·7	8·4	1·9	0·2	4·6	1·8	4·2	13·0	13·8	7·7	5·8	3·4	1·7	—	3·3	7·7	20·0	8·4	5·7	2·7	4·6	—

Remarks from Admiralty Log of H.M.S. "Pioneer."

1852.—NOVEMBER.

1st - - Thickness of old ice 2 ft. 1½ ins., snow on ditto 4½ ins.
„ new „ 1 ft. 5 ins. „ „ 6 ins.
11th - - Floe sank with weight of snow on port side of ship.
13th - - Old floe 2 ft. 4 ins., snow on ditto 1 ft. 8 ins.
New „ 1 ft. 10 ins. „ 1 ft. 6 ins.
13th - - A cubic foot of snow weighed 28 lbs. 2 oz.
16th - - Weighed a piece of ice, 114 lbs.; measurement of ditto 2 ft. 7 ins. by 1 ft. 4 ins. by 6 ins.
17th - - Weighed a cubic foot of ice, 54 lbs., and a second one, 53¼ lbs.
23rd - - Sudden shift of wind at noon.
24th - - A cubic foot of snow weighed 21 lbs. 6 ozs.
29th, 10.30 a.m. - A large halo round the Moon, and a bright spot on each side.
30th, 10 a.m. - Halo round the Moon.
30th - - Appearance of the Moon at 7.30 p.m. with an enlightened spot on each side.

During November five foxes were caught and one bear seen.



DECEMBER.

1st - - Old ice 2 ft. 3 ins., snow on ditto 11 ins.
New ice 2 ft. 4 ins. „ „ 1 ft. 3 ins.
2nd, 10.30 a.m. - Observed coruscations of the aurora in the S.W., shooting upwards towards the zenith.
6th, 11 a.m. - Observed coruscations of the aurora from S. to N.W., shooting upwards towards the zenith.
6th, 9 p.m. - Aurora borealis forming an arch in the zenith from N. to S.
10th, 1 a.m. - Faint aurora visible from N.E. to N.W.
10th, 7 a.m. - Aurora borealis visible to the Sd.
12th, 4 a.m. - A very bright aurora at intervals.
13th, 10 a.m. - Observed an aurora to the Wd.
14th - - Thickness of new ice 2 ft. 3½ ins., old 2 ft. 7 ins. Snow on new ice 1 ft. 1½ ins.
16th - - Three bears seen; also on 17th.
24th, 11 a.m. - An aurora visible.
28th, 11 a.m. till 8 p.m. } Mercury froze.
31st - - Thickness of new floe 2 ft. 3 ins. „ old „ 2 ft. 7¾ ins. } snow on ditto, 1 ft.

1853.—JANUARY.

4th, 1 p.m. - Mercury became solid.
5th, 10 a.m. - Observed coruscations of the aurora in the N.W.
8th, 11th p.m. - An aurora from S. to W.

14th - -	Thickness of old ice 2 ft. 10 ins., new ice 2 ft. 10 ins.
19th, 8 a,m. -	Aurora very bright from N.W. to S.E.
21st, 10 a.m. -	Sudden gusts of wind variable from N.E. to N.W.

FEBRUARY.

1st - -	Thickness of old floe 5 ft. 3 ins., new floe 4 ft. 1 in.
8th, 11 p.m. -	Faint aurora visible from S.E. to N.W.
10th, Noon -	The Sun was visible from a hill about 120 feet high.
12th, 9 p.m. -	Paraselenæ visible round the Moon.
17th, 2 p.m. -	Observed a parhelion on each side of the Sun.

MARCH.

6th, 9 p.m. -	An aurora visible in the S.E.
16th - -	Shot a she bear and two cubs.

MAY.

22nd - -	A wolf seen.

JUNE.

25th - -	Much water making between Spit Island and Mount Beaufort.
26th - -	Water much increased between Spit Island and Mount Beaufort.

JULY.

5th - -	Pack came in between Spit Island and ship considerably.
9th - -	Much water in the offing, ice apparently stationary.
13th - -	Pack apparently close and heavy in the offing. At 3 p.m. ship fairly afloat.
14th, 2.40 p.m. -	Left our winter position, Northumberland Sound.
14th, Midnight -	Abreast of the land about Mount Percy.
15th - -	Lat. 76° 29′ 47″.
17th - -	Lat. 76° 30′ 27″ Barrow's Monument S. 70° W.; Stewart Point N. 65° W.
18th - -	Lat. 76° 25′ 28″, long. 96° 35′ 16″. Variation of standard compass by azimuth 179° 34′ W.; head by ditto N.N.W. ½ W. Much water to Wd.
19th, Midnight -	Large water to the Wd. (true).
20th - -	Current running to N.Wd. ¾ mile per hour.
21st, 7.30 p.m. -	Docked ship in the land floe.
25th - -	Lat. 76° 25′ 28″, long. 96° 35′ 15″. Variation of standard compass by azimuth179° 34′ W.; head by N.N.W ½ W. Strong tide.
26th, 9 a.m. -	Made sail. Strong tide of about 3 miles per hour.
26th, 11.30 a.m. -	Abreast of Cape Beecher. Noon, Penny Point S.E. by E., Majendie Point N.W. ½ W., by standard compass.
27th, 1.30 a.m. -	Slack tide. Noon, lat. 76° 9′ 52″, long. 94° 38′. Variation per azimuth 162° E.; head by standard N.W. ½ W.
28th - -	Lat. 76° 10′ 31″, long. 94° 34′ 15″. Thin ice.
29th - -	A lead of water in by Margaret and Baillie Hamilton Islands.
31st - -	Lat. 76° 6′ 50″, long. 94° 36′. Variation of standard compass 176° 26′ W.; ship's head by standard N. 16° W.

AUGUST.

1st - -	A lead of water in by Baillie Hamilton Island, and leading thence S.Ely. (true) direction.
6th - -	Lat. 75° 56′ 11″, long. 94° 26′. Variation of standard compass 86° W.; head by ditto S. 83° E.
12th, Noon -	South extreme of Dundas Island N. 70° E. South extreme of Baillie Hamilton N. 10° W.
13th - -	Lat. 76° 2′ 34″, long. 94° 8′ 15″. Variation of standard compass 156° E.; head N. 60° W.
14th, 7 a.m. -	A lead of water seen from the crow's nest, extending to the Sd. (true) as far as the eye could reach.
15th - -	Lat. 76° 6′ 4″, long. 94° 10′ 45″. Variation of standard compass 115° 8′ W.; ship's head by ditto N. 40° E.
17th - -	Lat. 76° 4′ 15″.
20th, 8.30 a.m. -	Low water. Rise and fall observed 4 ft. 2 ins. Lat. 76° 16′ 51″.
20th, 7.50 p.m. -	Low water. Rise and fall observed 6 ft. 2 ins.
21st, 8 a.m. -	" " " 6 ft.
21st - -	Lat. 76° 17′ 4″, long. 94° 54′. Variation of standard compass 160° W.; head by ditto N. 10° W. At 8.10 p.m. low water. Rise and fall 11 ft. 1 in.
22nd - -	Lat. 76° 17′, long. 94° 5′.
23rd, 9.10 a.m. -	Low water. Rise and fall 5 ft. 9 ins. Noon, lat. 76° 16′ 31″, long. 94° 52′. Cape Majendie N. 129° 15′ W. about 5 miles. 3.50 p.m., high water, rise 5 ft. 4 ins. 10 p.m., low water, fall 5 ft.
24th, 10.15 a.m. -	Low water, rise and fall 5 ft. 4 ins. Noon lat. 76° 16′ 31″, long. 94° 52′. Variation of standard compass 160° W. At 4.10 p.m., high water, rise and fall 5 ft.
25th to 29th -	Lat. 76° 16′ 31″, long. 94° 52′.

WELLINGTON CHANNEL.

The results deduced from the observations made on board H.M.S. "Pioneer" in Wellington Channel are contained in Tables VII. to XII.

Table VII. is similar to Table I. March to July are incomplete, several of the midnight hours apparently not having been under observation. The means struck for these months are only of value for finding the resultants.

Table VIII. is similar to Table II. As far as the results can be computed out, the resultants derived from the "Pioneer's" observations agree remarkably with those derived from the "Assistance's." They both show the remarkable fact that the wind has less strength about 2 p.m. The gradual decline of the easterly component of the wind from 2 a.m. to 2 p.m., and its revival from 2 p.m. to 2 a.m., are very well corroborated.

Table IX. is similar to Table III. Here again the agreement is quite satisfactory both for direction and force.

Table X. is similar to Table IV. During this period the "Pioneer" recorded calms less frequently than the "Assistance." The hour least favourable to calms was noon according to the latter, and 4 p.m. according to the former. The number of days of calms in each month agrees pretty well except in January, February, and March.

Table XI. is similar to Table V. In January, February, and March the "Pioneer" recorded winds from E.S.E. and S.E. more frequently than the "Assistance," while the latter reported more southerly winds and more calms than the former. In April, May, and June the agreement is not so good as in the other months, probably because the master was absent sledging, and the observer was not so competent. On the whole, however, the agreement is good.

Table XII. is similar to Table VI. The "Pioneer" as compared with the "Assistance" recorded generally more frequent "blue sky" during December, January, February, and March; more in the winter, less in the summer; less squalls, especially in June, July; more rain in July On the whole the agreement seems satisfactory.

Table VII.

Sums of Wind Components, at Wellington Channel, H.M.S. "Pioneer," 1853 September, to 1854 August 24th.

Hour.	September 1853.				October 1853.				November 1853.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
2 a.m. -	9·0	32·2	21·0	32·7	16·1	36·6	40·0	23·9	19·9	41·5	27·1	17·0
4 „ -	14·0	28·6	17·1	33·8	16·9	33·7	34·5	29·6	18·7	44·4	32·7	17·4
6 „ -	10·3	29·8	12·7	31·5	11·1	28·7	32·2	24·6	13·7	38·8	25·1	17·1
8 „ -	9·6	28·2	16·7	31·6	14·0	25·9	36·6	18·8	13·1	38·6	26·8	13·8
10 „ -	8·8	29·8	18·5	32·0	15·1	30·7	31·4	19·0	13·1	34·2	21·3	13·0
Noon -	7·6	29·7	19·3	28·6	14·6	29·7	28·8	17·6	14·8	32·6	19·9	12·9
2 p.m. -	6·3	29·2	14·9	35·1	16·1	33·8	37·1	27·1	14·0	32·5	23·5	12·1
4 „ -	8·7	30·3	15·1	32·7	13·4	36·5	30·8	30·1	14·1	21·9	14·9	9·4
6 „ -	6·1	35·7	22·3	32·5	13·6	34·8	26·0	28·8	12·1	31·9	27·2	9·2
8 „ -	6·1	35·7	24·1	28·8	13·3	38·4	31·1	28·5	9·6	38·4	25·6	4·4
10 „ -	7·0	36·4	20·7	32·5	14·2	43·0	33·1	29·6	12·8	40·0	23·7	8·3
Midnight -	7·1	40·5	25·7	29·8	14·9	36·6	35·3	23·7	12·4	41·5	24·9	9·4
Means -	8·4	32·2	19·0	31·8	14·4	34·0	33·1	25·1	14·0	36·5	24·4	12·0

(*continued.*)

Hour.	December 1853.				January 1854.				February 1854.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
2 a.m. -	—	35·3	35·4	1·4	7·3	26·9	25·1	14·2	1·5	30·3	20·8	9·2
4 „ -	—	36·0	35·9	3·8	4·9	23·5	21·4	13·7	1·5	28·2	21·9	9·2
6 „ -	4·9	36·2	30·5	1·4	2·7	21·6	18·1	12·9	1·9	32·5	22·9	10·6
8 „ -	7·7	37·8	32·0	3·8	1·7	17·8	18·5	9·3	2·1	35·9	20·4	13·8
10 „ -	2·1	35·3	42·2	2·1	3·7	16·8	16·9	9·5	—	43·5	19·2	7·3
Noon -	3·8	30·9	39·2	4·0	3·7	20·8	23·1	10·5	0·4	38·3	14·1	8·1
2 „ -	3·6	29·9	39·2	4·4	5·1	22·0	20·1	14·6	1·4	35·0	23·6	7·1
4 „ -	2·1	32·0	46·9	5·2	3·2	26·7	15·0	12·6	—	36·4	31·4	6·7
6 „ -	0·7	28·5	42·7	3·2	4·1	22·4	16·6	9·5	—	37·2	34·6	4·4
8 „ -	7·1	31·6	45·6	3·7	3·2	23·2	15·5	11·4	—	29·5	33·9	3·2
10 „ -	6·5	35·1	47·8	4·1	2·5	18·9	11·5	14·2	1·6	42·1	26·8	10·2
Midnight -	3·8	40·4	44·5	2·7	4·3	27·8	16·7	15·3	0·7	32·7	23·1	9·6
Means -	3·5	34·1	40·2	3·3	3·9	22·4	18·2	12·3	0·9	36·0	24·4	8·3

TABLE VII. (*concluded*).

SUMS OF WIND COMPONENTS, at WELLINGTON CHANNEL, H.M.S. "PIONEER," 1853 September, to 1854 August 24th—*cont.*

Hour.	March 1854.				April 1854.				May 1854.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
2 a.m.	—	—	—	—	—	—	—	—	—	—	—	—
4 „	—	—	—	—	—	—	—	—	—	—	—	—
6 „ -	6·6	19·0	34·4	8·5	1·4	45·8	31·0	12·7	14·0	12·3	22·2	15·7
8 „	11·7	24·7	29·2	13·3	1·4	36·9	29·0	14·1	14·3	14·4	20·4	22·1
10 „ -	5·9	27·0	32·2	9·1	4·1	38·3	25·9	12·7	9·5	20·6	17·5	24·1
Noon	8·3	23·0	32·0	13·1	4·2	41·9	22·2	10·3	15·4	21·9	13·2	28·7
2 p.m. -	8·0	11·1	23·0	11·8	5·3	34·6	12·9	9·0	18·7	14·0	11·0	28·4
4 „ -	8·2	23·8	33·1	10·4	3·0	40·9	15·0	11·4	15·3	13·5	12·0	19·9
6 „ -	7·1	24·0	42·6	7·4	2·9	44·1	12·7	18·9	8·0	11·6	13·4	12·2
8 „ -	9·5	25·2	47·9	8·4	3·2	47·2	27·0	11·7	8·0	15·7	21·0	16·7
10 „ -	5·0	24·8	54·2	13·0	5·9	32·3	26·1	10·1	7·8	14·7	21·1	7·4
Midnight -	—	—	—	—	—	—	—	—	—	—	—	—
Means -	7·8	22·5	36·5	10·6	3·5	40·2	22·4	12·3	12·3	15·4	16·9	19·5

(*continued.*)

Hour.	June 1854.				July 1854.				August 1854.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
2 a.m. -	—	—	—	—	—	—	—	—	14·6	17·5	29·1	2·1
4 „ -	29·8	7·5	30·6	16·9	23·5	8·3	68·8	1·0	8·3	12·7	27·8	5·2
6 „ -	32·5	8·2	31·7	18·3	24·4	8·3	70·0	1·4	11·7	10·1	25·7	6·8
8 „ -	36·4	8·6	30·5	20·7	20·4	10·9	74·6	3·8	14·0	7·2	22·0	3·7
10 „ -	33·7	6·0	39·4	21·8	18·1	19·7	74·8	6·9	20·9	3·8	9·2	7·0
Noon -	37·8	7·4	37·8	22·2	21·3	17·7	68·1	7·5	26·0	7·9	15·5	8·0
2 p.m. -	33·7	5·1	34·2	16·5	16·4	6·5	54·7	5·0	30·3	7·2	19·9	10·6
4 „ -	34·7	8·2	32·1	19·4	23·0	4·2	55·1	6·7	29·1	3·6	19·3	11·4
6 „ -	33·6	7·6	33·3	18·3	21·7	2·5	57·7	3·4	27·5	7·3	22·3	9·6
8 „ -	34·4	8·7	31·5	19·5	25·4	2·9	59·8	3·2	25·1	7·4	22·8	6·3
10 „ -	32·9	9·0	28·1	19·8	—	—	—	—	19·8	7·3	21·4	4·0
Midnight -	—	—	—	—	—	—	—	—	24·0	9·5	21·3	3·4
Means -	33·9	7·6	32·9	19·3	21·6	9·0	64·8	4·3	20·9	8·5	21·4	6·5

TABLE VIII.

SUMS OF WIND COMPONENTS AND RESULTANT WINDS, at WELLINGTON CHANNEL, H.M.S. "PIONEER," 1853 September, to 1854 August 24th.

Hour.	Components.				Resultants.	
	N.	S.	E.	W.	Direction.	Force.*
2 a.m. -	—	—	—	—	—	—
4 „ -	—	—	—	—	—	—
6 „ -	135·2	291·3	356·5	161·5	S. 51 E.	250
8 „ -	146·4	286·9	356·7	168·8	S. 53 E.	235
10 „ -	135·0	305·7	348·5	164·5	S. 47 E.	251
Noon -	157·9	301·8	333·2	171·5	S. 48 E.	217
2 p.m. -	158·9	260·9	314·1	181·7	S. 52 E.	167
4 „ -	154·8	278·0	320·7	175·9	S. 50 E.	189
6 „ -	137·4	287·6	351·4	157·4	S. 52 E.	246
8 „ -	144·9	313·9	385·8	145·8	S. 55 E.	293
10 „ -	—	—	—	—	—	—
Midnight -	—	—	—	—	—	—
Mean -	—	—	—	—	—	—

* Must be divided by 365 to get the mean force at the given hour.

TABLE IX.

MONTHLY RESULTANTS OF THE WIND, at WELLINGTON CHANNEL, H.M.S. "PIONEER," 1853 September, to 1854 August 24th.

Month.	Resultants.	
	Direction.	Force.*
September 1853 -	S. 28° W.	0·90
October „ -	S. 22 E.	0·68
November „ -	S. 29 E.	0·86
December „ -	S. 50 E.	1·55
January 1854 -	S. 18 E.	0·63
February „ -	S. 25 E.	1·39
March „ -	S. 60 E.	0·97
April „ -	S. 15 E.	1·27
May „ -	S. 40 W.	0·13
June „ -	N. 27 E.	1·00
July „ -	N. 78 E.	2·00
August „ -	N. 50 E.	0·80

† In grades of Beaufort's scale.

TABLE X.

CALMS NOTED AT WELLINGTON CHANNEL, H.M.S. "PIONEER," 1853 September, to 1854 August 24th.

Hours.	1853.				1854.								
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Year.
2 a.m. - - -	4	8	6	14	10	12	No observations.			—	—	6	
4 „ - - -	6	2	4	10	10	7	No observations.			9	7	9	—
6 „ - - -	6	7	7	13	11	7	13	6	6	9	7	10	102
8 „ - - -	4	6	7	10	11	3	4	10	4	4	3	7	73
10 „ - - -	4	6	4	8	11	3	5	6	4	7	3	8	69
Noon - - -	4	6	3	6	9	6	6	8	6	7	3	5	69
2 p.m. - - -	5	3	6	9	7	6	7	11	4	2	5	5	70
4 „ - - -	3	2	4	7	9	3	6	13	4	2	3	6	62
6 „ - - -	5	6	9	7	8	2	4	9	9	1	7	5	72
8 „ - - -	6	4	9	6	8	4	5	7	7	1	7	5	69
10 „ - - -	6	3	7	9	11	4	4	10	15	3	—	7	—
Midnight - - -	3	1	6	8	7	8	No observations.			—	—	9	—
Means - - -	5	4	6	9	9	5	6	9	7	4	5	7	—

Force 8 and upwards of the wind was noted as follows: in October 17 times, November 7, December 11, January 1, March 3, April 12, June 8, August 2.

Table XI.

Summary of Winds, referred to Sixteen Points, with Mean Force (Scale 0 to 12), Wellington Channel.

Months.	Total Observations.	N.		N.N.E.		N.E.		E.N.E.		E.		E.S.E.		S.E.		S.S.E.	
		O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.
1853.																	
September	360	10	1·3	5	1·4	4	1·7	7	1·7	11	1·5	38	4·1	14	2·3	17	3·5
October	372	13	2·2	7	4·6	18	2·6	12	1·2	12	1·4	40	3·7	55	4·2	13	4·5
November	360	3	4·7	20	3·1	20	3·1	2	3·5	5	2·4	28	2·5	62	3·2	13	3·2
December	372	—	—	1	2·0	3	7·0	2	8·0	12	5·2	41	3·2	122	2·7	30	3·1
1854.																	
January	372	—	—	—	—	1	1·0	1	7·0	9	3·4	14	2·0	115	1·6	21	2·5
February	336	—	—	—	—	—	—	1	1·0	7	3·4	33	3·1	80	2·4	55	2·1
March	279	8	1·6	4	1·0	4	1·2	2	2·5	17	3·3	54	4·3	27	2·0	15	1·6
April	270	6	1·3	—	—	3	2·0	—	—	16	3·6	25	3·8	31	2·0	6	3·0
May	279	2	3·0	9	1·8	16	1·8	2	1·5	18	2·8	14	3·9	12	2·2	4	1·7
June	300	20	1·6	5	4·0	30	4·1	12	6·6	23	4·0	15	2·6	16	3·1	3	2·3
July	279	28	1·4	3	2·7	30	3·7	30	4·9	72	4·0	10	4·2	12	4·3	1	5·0
August	288	51	2·3	7	2·7	5	2·6	6	4·2	23	4·5	17	3·7	20	3·7	1	6·0

(*continued.*)

Month.	S.		S.S.W.		S.W.		W.S.W.		W.		W.N.W.		N.W.		N.N.W.		Variable.		No. of Calms.
	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	
1853.																			
September	16	2·9	43	2·9	33	2·4	15	3·9	39	3·2	25	3·5	12	2·4	11	1·5	4	1·2	56
October	9	1·4	13	1·7	35	2·5	31	3·4	16	3·4	16	3·1	11	2·9	13	2·8	4	1·0	54
November	30	4·9	24	3·3	11	1·8	6	3·2	10	3·1	11	1·9	25	1·8	8	1·1	10	1·0	72
December	17	2·0	3	1·3	3	1·3	2	1·5	13	1·2	—	—	14	1·8	1	1·0	1	1·0	107
1854.																			
January	17	1·7	6	1·5	14	2·6	15	2·6	17	1·8	12	2·2	16	2·6	2	1·0	—	—	112
February	27	2·4	18	3·1	22	2·2	9	1·7	8	1·5	7	2·4	3	1·3	1	1·0	—	—	65
March	20	1·4	2	4·0	20	1·3	3	1·3	13	2·5	5	1·6	26	2·1	5	1·2	—	—	54
April	35	5·1	4	4·5	32	3·1	2	1·5	10	1·4	4	1·0	13	1·5	3	1·3	—	—	80
May	20	1·6	13	3·5	13	1·8	3	2·0	27	2·3	20	1·7	30	1·6	17	1·4	—	—	59
June	—	—	—	—	10	2·6	6	1·0	9	1·4	8	1·0	85	2·3	13	2·8	—	—	45
July	4	3·0	—	—	8	1·7	4	1·0	16	1·0	2	1·0	8	1·0	6	1·0	—	—	45
August	4	1·0	1	1·0	13	1·8	1	1·0	1	1·0	5	1·8	16	1·6	34	2·6	1	1·0	82

Table XII.

Weather Notations, at Wellington Channel, H.M.S. "Pioneer," 1853 September, to 1854 August 24th.

Hour.	September 1853.								October 1853.								November 1853.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
2 a.m.	4	9	17	6	—	—	6	1	5	10	16	9	1	—	1	2	9	12	9	10	—	—	2	2
4 „	4	9	17	6	—	—	7	1	4	9	18	10	—	—	1	2	8	11	11	11	—	—	3	3
6 „	5	11	14	7	—	—	5	1	5	6	20	11	—	—	1	2	10	8	12	13	—	—	2	1
8 „	6	9	15	8	—	—	6	2	4	9	18	14	—	—	1	2	11	6	13	12	—	—	2	2
10 „	6	8	16	6	—	—	7	2	5	5	21	14	—	—	4	2	12	8	10	12	—	—	3	2
Noon	6	9	15	9	—	—	5	2	5	7	19	13	1	—	3	2	11	8	11	13	—	—	3	2
2 p.m.	7	8	15	6	—	—	6	2	4	9	18	10	1	—	3	—	9	8	13	11	—	—	1	2
4 „	9	7	14	5	—	—	7	2	4	9	18	8	1	—	6	—	9	10	11	7	—	—	2	2
6 „	8	7	15	5	—	—	6	2	5	9	17	10	1	—	5	—	10	9	11	8	—	—	2	1
8 „	7	8	15	5	—	—	6	1	5	9	17	8	1	—	5	2	11	12	7	5	—	—	1	1
10 „	6	10	14	4	—	—	5	1	6	10	15	6	2	—	4	2	11	11	8	7	—	—	4	1
Midt.	5	12	13	3	—	—	4	2	5	11	15	7	1	—	4	2	10	12	8	8	—	—	3	1
Means	6·1	8·9	15·0	5·8	—	—	5·8	1·6	4·7	8·6	17·7	10·0	0·7	—	3·2	1·5	10·1	9·6	10·3	9·7	—	—	2·3	1·7

(*continued.*)

Hour.	December 1853.								January 1854.								February 1854.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
2 a.m.	17	6	8	19	—	—	2	—	18	6	7	16	—	—	4	—	17	6	5	14	1	—	1	—
4 „	17	7	7	18	—	—	2	1	18	7	6	18	—	—	1	—	17	6	5	15	1	—	1	—
6 „	18	5	8	18	—	—	1	1	19	8	4	19	—	—	1	—	16	7	5	15	—	—	1	—
8 „	17	7	7	16	—	—	2	—	19	8	4	19	—	—	1	—	16	6	6	10	2	—	—	—
10 „	18	7	6	16	—	—	1	—	20	7	4	15	1	—	1	—	18	6	4	10	2	—	—	—
Noon	18	9	4	16	—	—	2	—	19	7	5	17	1	—	2	—	18	6	4	12	2	—	—	—
2 p.m.	18	6	7	15	—	—	2	1	20	7	4	14	—	—	2	—	18	6	4	14	1	—	—	—
4 „	17	5	9	14	—	—	1	—	18	8	5	20	—	—	2	—	17	7	4	16	1	—	—	—
6 „	18	6	7	16	—		2	1	17	9	5	19	—	—	2	—	18	6	4	15	—	—	1	—
8 „	19	7	5	16	—	—	2	1	17	10	4	18	1	—	3	—	19	5	4	12	—	—	2	—
10 „	19	8	4	19	—	—	1	1	18	9	4	20	—	—	2	—	17	6	5	16	—	—	2	—
Midt.	19	8	4	18	—	—	1	—	18	8	5	17	—	—	3	—	17	7	4	15	—	—	1	—
Means	17·9	6·8	6·3	16·7	—	—	1·6	0·5	18·4	7·8	4·8	7·7	0·2	—	2·0	—	17·3	6·2	4·5	13·7	0·8	—	0·7	—

TABLE XII. (*concluded*).

WEATHER NOTATIONS, at WELLINGTON CHANNEL, H.M.S. "PIONEER," 1853 September, to 1854 August 24th—*cont.*

Hour.	March 1854.								April 1854.								May 1854.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
2 a.m.	No observations.								No observations.								No observations.							
4 „	No observations.								No observations.								No observations.							
6 „	16	8	7	20	—	—	—	1	11	8	11	22	—	—	3	1	8	10	13	14	—	—	1	—
8 „	17	9	5	15	—	—	2	1	12	8	10	18	—	—	9	4	9	8	14	13	—	—	5	2
10 „	17	12	2	21	1	—	—	2	13	6	11	13	—	—	5	1	9	11	11	11	—	—	6	1
Noon	15	14	2	23	1	—	—	2	14	8	8	13	—	—	3	1	8	10	13	11	—	—	5	—
2 p.m.	17	12	2	19	1	—	2	1	14	8	8	14	—	—	5	2	8	9	14	9	—	—	4	4
4 „	16	10	5	21	—	—	5	1	15	4	11	10	—	—	2	1	11	10	10	7	—	—	5	2
6 „	17	5	9	17	—	—	2	—	13	7	10	16	—	—	4	2	10	11	10	11	—	—	6	1
8 „	15	8	8	20	—	—	3	1	14	5	11	13	—	—	4	3	10	12	9	8	—	—	6	4
10 „	15	10	6	19	—	—	—	3	15	5	10	9	1	—	5	2	9	11	11	10	—	—	4	3
Midt.	No observations.								No observations.								No observations.							
Means	16·1	9·8	5·1	19·4	0·3	—	1·6	1·3	13·4	6·6	10·0	14·2	0·1	—	4·4	1·9	9·1	10·2	11·7	10·4	—	—	4·7	1·9

(*continued.*)

Hour.	June 1854.								July 1854.								August 1854.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
2 a.m.	No observations.								No observations.								7	13	4	5	5	—	1	—
4 „	8	13	9	2	—	—	3	1	2	14	15	2	—	8	1	—	6	11	7	3	5	—	2	—
6 „	8	12	10	4	—	—	4	1	3	15	13	2	—	7	—	—	7	10	7	4	5	—	2	1
8 „	9	10	11	7	—	—	4	1	3	19	9	1	—	5	3	—	6	13	5	5	5	—	2	—
10 „	10	8	12	4	—	—	3	1	4	20	7	2	—	5	2	2	6	12	6	4	7	—	1	—
Noon	9	7	14	6	—	1	5	—	4	20	7	2	—	4	3	1	7	13	4	2	7	—	—	1
2 p.m.	10	8	12	1	—	—	4	1	5	16	10	2	—	3	1	1	8	13	3	1	4	1	—	—
4 „	7	10	13	2	—	—	2	—	4	18	9	1	2	1	1	1	7	13	4	1	4	2	—	—
6 „	6	8	16	3	—	—	3	2	4	18	9	1	2	2	1	—	7	12	5	3	4	1	—	—
8 „	8	10	12	2	—	—	5	2	3	17	11	—	1	4	1	—	7	13	4	5	4	—	—	—
10 „	9	11	10	2	—	—	6	2	Incomplete.								7	12	5	7	2	1	—	1
Midt.	No observations.								No observations.								7	13	4	6	2	1	1	1
Means	8·4	9·7	11·9	3·3	—	0·1	3·9	1·1	3·6	17·4	10·0	1·4	0·6	4·3	1·4	0·6	6·8	12·4	4·8	3·8	4·5	0·5	0·7	0·3

REMARKS from the ADMIRALTY LOG of H.M.S. "PIONEER."

1853.—SEPTEMBER.

1st - - Progress much retarded by the strength of the newly formed ice. Noon, lat. 76° 15′ 30″., bearings by standard compass, Cape Majendie S. 78° E., north extreme of Dundas Island S. 89° E., south extreme of Margaret Island N. 64° E.; head by standard, N.W. Variation allowed 160° E.

2nd, Noon - Lat. 75° 37′ 26″, long. 92° 22′. Variation of standard compass 151° W.; head by ditto N.byW.

5th, „ - Lat. 75° 31′ 15″, long. 92° 21′ 55″.

17th, 9.30 a.m - Docked ship.

20th - - One hare shot.

22nd - - A deer seen.

OCTOBER.

10th - - Lat. 75° 31′ 15″, long. 92° 21′ 55″. Variation on shore 150° 30′ W.

11th, 7 p.m. - Ship blown out of winter quarters.

14th, 4.50 a.m. - Low water, rise and fall 2 feet 7 inches. Young ice forming. Surrounded by bay ice.

28th - - A fox caught.

NOVEMBER.

1st - - Thickness of newly formed floe 1 foot 6 inches.

5th - - A fox caught. Aurora borealis visible.

8th, 7 p.m. - An aurora visible.

23rd - - Stars visible at noon. 4 p.m., a slight aurora visible to the Ed.

26th, 8 p.m. - An aurora visible forming an arch from E.S.E. to N.W.

27th, 3 a.m. - A slight aurora to the Sd. 8 p.m., an aurora visible to the Ed.

28th, 6 a.m. - An aurora visible forming an arch from E. to W. 5 p.m., an aurora visible to the Ed.

DECEMBER.

2nd - - Thickness of ice 2 feet 4 inches.

6th, 8 p.m. - Slight coruscations of the aurora visible to N.E. and S.W.

7th, 3 a.m. - An aurora visible to N.E.

9th, 8 p.m. - Quicksilver became solid for first time this season.

11th, 9 a.m. - Mercury froze. 10.30 p.m., halo observed round the Moon.

12th, 10 p.m. - A halo visible round the Moon.

15th - - Thickness of ice 3 feet 2 inches; snow on it 7 inches.

16th, 3 p.m. - A faint aurora visible to the E.N.E.

17th, Noon - Mercury frozen.

19th, Midn. - A large halo round the Moon.

20th, 6 p.m. - A faint aurora visible to the S.E. Midn., bright aurora to the S.S.E.

21st, 3 a.m. - Bright aurora to the S.E.

26th, 2 a.m. - Aurora very bright to the Sd.

28th, 4 a.m. - Mercury solid.

29th, 6 a.m. - An aurora visible to the Ed.

1854.—JANUARY.

1st - - Thickness of ice 3 feet 4 inches.
8th, 3 p.m. - Mercury frozen to 14th, 9 p.m.
12th, Noon - Appearance of the Moon: Fig. *a*.
15th, 8 p.m. - Mercury frozen.
16th, 2 a.m. - Halo round the Moon. Thickness of ice 3 feet 7 inches; snow on it, 3 inches.
17th, 1 a.m., to 22nd, 3 p.m. Mercury frozen.
17th, 10 a.m. - An aurora visible, forming an arch in the zenith from N.W. to S.E.
17th, Noon - Appearance of the Moon: Fig *b*.
20th, 2 a.m. - An aurora visible from N.W. to S.E.
21st, 7 a.m. - Halo round the Moon.
25th, 1 a.m., to 30th, 6 p.m. Mercury frozen.

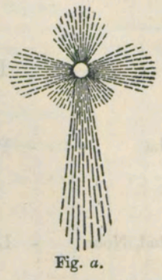


Fig. *b*.

Fig. *a*.

6th, 8.30 p.m. - An aurora very bright, forming an arch in the zenith from N.W. to S.E.
27th, 9 p.m. - An aurora visible to the S.W.
31st, 7 a.m. - An aurora visible, forming an arch from E. to W.
31st, 5.25 p.m. - Observed a meteor shooting from N.N.W. to S.S.E.
31st, 6 p.m. - Mercury solid.
A wolf was seen on the 6th, 9th, 18th, and 30th.

FEBRUARY.

1st, 1 a.m., to 4th, 8 p.m. Mercury frozen.
4th, 4 a.m. - Aurora visible from N.E.byE. to S.W.
4th, 8 a.m. - Aurora visible to the Sd.
5th, 5 a.m., to 12th, 5 a.m. Mercury frozen.
9th, 11.50 a.m. - The upper limb of the Sun seen off a hill 200 feet high.
10th, 5 a.m. - Halo observed round the Moon.
19th, 9 a.m., to 21st, 10 a.m. Mercury frozen.
22nd, 10 p.m. - An aurora visible to N.N.W.
23rd, 4 a.m. - Mercury frozen.
23rd, 7 p.m., to 24th, 2 p.m. Mercury frozen.
23rd, 9 p.m. - An aurora visible, forming an arch in the zenith from N.N.W. to S.S.E.
24th, 7 p.m., to 25th, 10 a.m. Mercury frozen.
25th, Midn. - Mercury frozen.
26th, Noon - Mercury frozen.
26th, 9 p.m. - Mercury frozen.
27th, 10 p.m. - An aurora, forming an arch from N.N.E. to S.S.W.

MARCH.

3rd, 3 p.m. - Observed for the first time this year a melting of snow on the ship's side.
5th, 10 p.m., to 6th, 9 a.m. Mercury frozen.
5th, 10 p.m. - Aurora very bright and forming an arch from N.W. to S.E.
6th, 2 p.m., to 7th, 9 a.m. Mercury frozen.
7th, 6 p.m., to 8th, 5 a.m. Mercury frozen.
7th, 9 p.m. - An aurora visible, forming an arch from N.W. to S.E.
9th - - Mirage very great to the Nd.
9th, 8 p.m., to 10th, 5 a.m. Mercury frozen.
10th, 8 a.m. - Mercury frozen. Much mirage to the Wd. At 10 p.m. a large halo round the Moon.
11th, 9 p.m. - A partial halo.

12th, 8 p.m. - Halo round the Moon.
13th, 4 p.m., to 15th, 5 a.m. Mercury frozen.
19th, 8 p.m. - Mercury frozen.
20th, Noon - A parhelion on each side of the Sun.
23rd, 6 a.m. - Mercury solid; also 25th, 6 a.m. and 10 p.m., and 27th, 6 a.m.
A wolf was seen thrice, a raven twice, and two hares were shot.

APRIL.

8th - - Saw two ptarmigan.
26th - - A snow-bunting seen.

MAY.

16th - - Several snow-buntings seen.
17th - - A wolf and a raven seen.
28th - - A flock of ducks seen flying to the Sd.
31st - - Two ptarmigan seen.

JUNE.

2nd - - A bear and two cubs seen. A flock of ducks flying North.
14th - - A flock of ducks flying to the northward.
26th - - Several ducks and geese seen going to the northward.

JULY.

16th, 1 p.m. - Observed from the top of the hill a lane of water running in the direction of the channel, apparently 8′ or 10′ distant.
19th - - Lane of water seen on the 16th considerably increased in length.

AUGUST.

3rd, Noon - From the top of the hill observed a lane of water about 4 miles off ship, extending as far to the Nd. as could be seen with a glass, and to the S.W. apparently into the land.
4th - - Water seen yesterday much increased in breadth to the S.Wd.
5th, 8 p.m. - A sudden movement took place in the ice, it moving off shore. Got out stream chain and secured to a grounded piece of ice.
6th - - Lat. 75° 31′ 7″ long 92° 22′; 6.30 p.m., secured to floe.
7th, 8th, 9th - Lat. 75° 21′ 26″, long. 92° 41′ 30″.
8th - - Tried the strength of tide; found it about $1\frac{3}{4}$ knots per hour.
10th - - Tracking along the inshore lead.
10th, 9.30 a.m. - Secured to land floe.
11th - - Lat. 75° 21′ 3″, long. 2° 36′ 45″.
20th - - Young ice forms during the night.

No. XIII.

Results of the Meteorological Observations made during the Drift of the "Fox" in Baffin's Bay.

During the memorable arctic voyage of the steam yacht "Fox," 1857–9, under command of Captain (now Vice-Admiral Sir) Francis Leopold McClintock, undertaken, at the instance of Lady Franklin, to search for traces of the missing expedition under Sir John Franklin, a valuable meteorological register was kept. An abstract of that register has been published in the "Fourth Number of Meteorological Papers, 1860." That abstract gives the daily record *for noon only*, and the observations as *actually read off*, neither reduced nor meaned.

A duplicate of the register having been sent to the Smithsonian Institute, Washington, an elaborate discussion of the observations by Charles A. Schott, has been published in "Smithsonian Contributions to Knowledge, No. 146." This valuable monogram, consisting of 166 folio pages, may be thought almost to exhaust the register. However, as Schott's *Discussion* is conducted on the chronological method, while the present investigation is based on a geographical plan, it was necessary to consult the original register *de novo*. The register kept during the winter drift down Baffin's Bay has to be considered by itself, because there are no similar data to combine with it; that kept in winter quarters also necessarily has to be discussed alone, but the register kept during the ordinary navigation of the ship will be utilised in combination with registers kept by other ships.

The meteorological instruments were lent by the Meteorological Department. None of the thermometers had been tested lower than 32°. It appears from Schott's *Discussion* that the temperature during the winter 1857–8 was taken from an alcohol thermometer, No. 11, by Newman. The instrument was returned broken, so it was not possible then to test it. However from data furnished by Sir F. L. McClintock, and printed in Schott's *Discussion*, it appears that this thermometer required corrections as follows: At −50°, correction −2°·2; at −40°, −1°·5; at −30°, −0°·4; at 20°, −0°·4; at −10°, 0; at 0, 0; at +20°, +0°·1. These corrections have accordingly been applied to the observations.

The observations of the barometer have been corrected for instrumental errors, and for temperature and height above sea-level as usual.

The direction of the wind has been corrected for variation of the compass.

The deep-sea temperatures, recorded in the remarks, were made Six's thermometers, the bulbs of all of them being protected with mercurial jackets by Negretti and Zambra; their indications, therefore, could not have been sensibly affected by pressure. The index-errors of these instruments, however, were in no way noticed, apparently.

The specific gravity observations of the sea water have been reduced to temperature 60°.

David Walker, M.D., the surgeon who had charge of the meteorological register, gives the following description of the ozonometer, used between 1857 September 5th, and 1858 April 18th: "The test papers used for measuring the amount of ozone in the atmosphere were prepared by moistening filtering paper in a solution of iodide of potassium, one grain to 100 of water. These papers when dried, were hoisted to the mizen masthead, and allowed there to remain for 12 hours, and then replaced for a new paper. In order to exclude the papers from the light and rain or snow, they were inclosed in a 4 inch square box pierced with holes in every direction so as to allow a free current of air; the paper was fastened to a small stick which wheeled round in the inside of the box on two points. The size of the paper was 2½ inches by 2. The scale of colours, used to distinguish the amount of coloration of the paper was formed by diluting tincture of iodine (L. Ph.) with spirit of wine. The highest number being 12, formed by equal parts of iodine and spirit; 11, formed by 2 of spirit to 1 of tincture; 10, by 3 of spirit to 1 of tincture, and so on till 1, formed by 12 of spirit to 1 of tincture."

In the "Report of the British Meteorological Society for 1860," Doctor Walker writes: "As our first winter was spent in an ice drift down Baffin's Bay and Davis' Straits, many observations were necessarily left unrecorded, but those which were noticed are of interest, as showing the meteorological effect of being placed in the middle of a large mass of ice. In the month of January a set of hourly observations were made in order to find the hours of maximum and minimum barometric pressure. Curiously enough, there was found to occur only one maximum and one minimum in the twenty-four hours, showing that the effect of being surrounded by a large body of ice acted precisely in the same manner as if the observing station had been in the centre of a large continent; the hours of this maximum and minimum were 11 p.m. and 8 a.m.

"The lowest degree of cold registered during 1857–58, was −48° F., occurring during a calm. The lowest mean monthly temperature during the winter was −24°·84, for January; and the hours of maximum and minimum temperature were, maximum 11 a.m. and 8 p.m., minimum 7 a.m. and 4 p.m. The lowest degree of cold was always noticed during calm weather and generally at the time of full moon."

"Attached to the extremity of the yard-arm, by an insulated support, there was a fine wire, which was carried to the ice, so as to be connected to another which was immersed in the water beneath. Here, by means of the electroscope, the variation in the amount of atmospheric electricity was noticed, and the times of minimum electric tension registered. Owing to the rough instrument used, the hours of maximum

tension could not be accurately recorded; the hours of minimum intensity were noon and 9 p.m. The presence of the aurora was found to influence considerably the indications of the gold leaves of the electroscope, the leaves at such times diverging with greater force, and remaining separate for a much longer time than usual. The direction, form, colour, &c. of the aurora were noticed; and it is a curious fact that about half of those noticed during 1857–8 were in a direction where water or water-sky had been seen during the day."

Schott has discussed the temperature of the winds, and concludes that for Baffin's Bay the S.E. winds are the warmest, the S.W. the coldest, and that during calms the temperature is low.

Sir F. L. McClintock, in his narrative of the "Voyage of the Fox," writes, under date 1857 November 23rd: "A heavy gale commenced at N.E. on the 21st, and continued for thirty-six hours unabated in force, but changed in direction to S.S.W. It appears to have been a revolving storm, moving to the N.W. Yesterday, as the wind approached S.E., the temperature rose to +32°; the upper deck sloppy; the lower deck temperature during divine service was 75°!! As the wind veered round to the S.S.W., the wind moderated, and temperature fell; this evening it is −7°. How is it that the S.E. wind has brought us such a very high temperature? Even if it traversed an unfrozen sea, it could not have derived from thence a higher temperature than 29°. Has it swept across Greenland—that vast superficies, partly enveloped in glacier, partly in snow? No, it must have been borne in the higher regions of the atmosphere from the far south, in order to mitigate the severity of this northern climate.

"Petersen tells me the same warm S.E. wind suddenly sweeps over Upernavik in midwinter, bringing with it abundance of rain; and that it always shifts to the S.W., and then the temperature rapidly falls; this is precisely the change we have experienced in lat. 75°."

Sir Allen Young in a paper in the Cornhill Magazine, Jan. 1860, also remarks on this peculiar warm wind, under date 1857 December 28th: "During divine service yesterday the wind increased, and towards the afternoon we had a gale from the northwestward, attended with an unusual rise of temperature; to-day the gale continues with a warm wind from the N.N.W.

"The Danish settlers at Upernavik, in North Greenland, are at times startled by a similar rise of temperature. During the depth of winter, when all nature has been long frozen, and the sound of falling water almost forgotten, rain will fall in torrents, and as rain in such a climate is attended with every discomfort, this is looked upon as a most unwelcome phenomenon. It is called the *warm south-east wind**. Now if the Greenlanders at Upernavik are astonished at a *warm south-east wind*, how much rather

* This warm south-east wind has been already noticed in this work in the paper on the Meteorology of Frederikshaab, p.p. 19, 20.

must the seamen, frozen up in the pack, be astonished at a warm *north-west wind*. Various theories have been started to account for this phenomenon, but it appears most probable that a rotatory gale passes over the place, and that the rise in temperature is due to the direction from which the whole *mass of air* may come, viz., from the southward, and not to the direction of *wind* at the time."

"During our drift down Baffin's Bay and Davis' Straits, the aurora was noticed on 43 nights; of these, 18 were observed in a direction where water or water-sky had been seen during the day. The general direction of the remainder was between N.E. and S.E. None were particularly bright but two or three, and even these scarcely equalled the brilliancy of those seen at times in the north of Scotland. On some occasions the aurora was from horizon to zenith, but generally from 10° to 40° above the horizon, with occasional streamers; these latter were generally present towards the zenith, but only sometimes reaching so far. At times pulsations were noticed in the patches and bands of light; these were often contrary to the surface wind. On the whole, stars of all magnitudes were dimmed when viewed through the aurora, but only those of small magnitude were rendered invisible. Once only was there noticed a connection between cirrus clouds and the aurora."—Dr. R. Walker, quoted in Smithsonian Contributions No. 146, p. 145.

The results of the meteorological observations made during the drift of the "Fox" have been grouped under each month, an arrangement which appears most suitable for consultation by commanders of whalers and others who may hereafter find these data valuable guides. Although several instances have occurred of ships wintering in Baffin's Bay, no such trustworthy meteorological data for that place and season are at present available anywhere else. In the year 1821, the whaler "Dundee," Captain Duncan, was frozen in Baffin's Bay, and passed the winter in the ice-drift; a similar misfortune occurred to the "Swan," Captain Dring, 1836, and to the "Diana," Captain Gravell, in 1866. The "Queen," whaler, Captain Brown, wintered off Cape Horsburgh in 1865. The American exploring brig "Advice," Captain De Haven, U.S.N., drifted from Wellington Channel to Davis' Straits between September 1850 and June 1851. It is evident from these instances, which are probably not the sole ones, that being frozen in for the winter is a contingency to be provided for by captains visiting these regions for whales; and consequently all possible information regarding the phenomena of nature in this region is not only valuable and interesting, but may tend to the preservation of life and property.

The wind-roses, given in the monthly results, have been compiled from all the observations in the respective months. The directions of the winds have been grouped under sixteen points of the compass. The numbers in the outer annulus show the times the direction was noted, and those in the inner annulus the mean force of the wind by Beaufort's scale.

There is a tendency in the wind, during the afternoon hours, to veer to E. and S.E. from N.W. or N., and to decrease in velocity. This is especially noticeable in September and October.

The lowest barometer appears to occur in Baffin's Bay, during winter, before the highest temperature.

McClintock states that on March 27th "snow was observed to melt against the ship's side exposed to the sunshine, the thermometer in the shade standing at —22°.

In a letter addressed to Admiral FitzRoy, dated Holsteinborg, 1858 May 5, Captain McClintock states :—

"From all that I have been able to observe upon our line of drift down the middle of Davis' Strait, the ice movement (during winter) is almost entirely due to the winds, not to current; nor have we noticed any indication of an under-current to the north. Icebergs were our companions from 75½° N. to the Arctic Circle. As this is not quite in accordance with the published views of Lieut. Maury, I enclose an abstract of our monthly winds and drifts.

"The direction of duration has been worked out like a day's work, the number of hours upon each point of the compass being regarded as miles. The direction of force of the wind has been similarly obtained by regarding the accumulated hourly force, according to the Beaufort scale, upon each point, as so many miles. The directions of duration and force thus obtained nearly agree, and, compared with our true drift, show at once whether other causes were at work in affecting the movement of the ice. To ascertain whether our mileage was proportional to the strength of the prevailing wind, I used a simple formula dependent thereon, which answered the purpose of comparison sufficiently well."

"It seems to me strange that the ice should be disturbed at spring tides throughout the winter, wide and long lanes of water opening out, generally across the Strait, and that these movements should take place so far from land. For five months we were more than 100 miles from the nearest point; our greatest difference was 130 miles, (geographical).

"Another unexpected fact came under our notice; the ocean swell became perceptible to us when 40 miles within the margin of the pack, and subsequently, when more than 20 miles from open sea, the swell suddenly rolled in and soon broke up the ice, the height of the swell increasing as the ice broke up into smaller pieces, until it reached 5 or 6 feet."

TABLE OF THE WIND AND ICE-DRIFT experienced by the Arctic Searching Yacht "Fox."

Date.	Limits of Latitude and Longitude.	Mean Force of Wind.	Direction		Winds in prevailing Quarters.		True Drift.	Drift by Empirical Formula.	Remarks.
			Of Duration.	Of Force.	Hours in Excess.	Mean Force.			
1857. September -	75° 28′ N. to 75° 01′ N. 64 20 W. „ 66 00 W.	3·18	N. 17° W.	N. 8° E.	N. to W. 126 hrs.	2·83	S. 40° W. 37′	S. 12° E. 35′	In Melville Bay 25′ to 40′ off shore, ice-drift affected by local cause.
October -	75 33 N. „ 74 50 N. 65 40 W. „ 69 30 W.	3·05	N. 42 W.	N. 13 W.	N. „ W. 144 „	2·85	N. 75 W. 49	S. 28 E. 41	Water to W. and N.W., and ice more free to move to that direction. Much ice to the S.
November -	74 34 N. „ 75 13 N. 68 00 W. „ 69 40 W.	3·84	N. 73 W.	N. 75 W.	N. „ W. 224 „	3·83	S. 9¼ W. 32	S. 74 E. 85	Similar to last month, ice accumulating to the N.W.
December -	74 41 N. „ 73 54 N. 69 10 W. „ 66 0 W.	2·88	N. 62 W.	N. 61 W.	N. „ W. 244 „	3·18	S. 47⅓ E. 68	S. 61 E. 77	In mid-channel, a tendency to drift westward, whether owing to current or earth's rotation not known.
1858. January -	73 50 N. to 72 28 N. 65 47 W. „ 61 10 W.	3·41	N. 43 W.	N. 44 W.	N. „ W. 252 „	4·58	S. 44¾ E. 113	S. 44 E. 116	In mid-channel.
February -	72 30 N. „ 69 50 N. 61 26 W. „ 59 43 W.	4·45	N. 28 W.	N. 26 W.	N. „ W. 334 „	5·13	S. 5 E. 166	S. 27 E. 171	Parallel to and distant from the Greenland shore about 120′.
March -	70 3 N. „ 68 20 N. 60 15 W. „ 58 45 W.	3·96	N. 15 W.	N. 19 W.	N. „ W. 246 „	4·05	S. 16 E. 94	S. 17 E. 100	Parallel to and distant from the Greenland shore about 100′ to 120′.
April 1 to 17 at noon.	68 17 N. „ 65 28 N. 58 32 W. „ 58 48 W.	4·39	N. 11 W.	N. 11 W.	N. „ W. 214 „	5·34	South 168	S. 11 E. 114	Parallel to the Greenland shore, but much closer to the west land, from which the ice appeared to be deflected eastward. Our nearness to the open sea may account for our rapid increase of drift. The ice certainly appeared by the sounding line to drift more freely than heretofore. I could not ascertain the existence of current.

Finding that an ordinary fresh breeze (force 5) would usually drift the pack 12 miles in 24 hours, I then constructed my formula thus :—

No. of hours in excess of prevailing wind, × its mean force × $\frac{1}{10}$ = drift of free packed ice.

For example, (March) $\frac{246 \text{ hrs.} \times 4{\cdot}05}{10} = 99{\cdot}6$ miles.

Results of Meteorological Observations, made on board the "Fox," Captain F. L. McClintock.

1857.—AUGUST 17th to 31st.

Beset and drifting with the pack between lat. 75° 22′ N., long. 62° 41′ W., and lat. 75° 30′ N., long. 64° 4′ W.

Hour.	Barometer.	Temperature.	Wind Components: Sums.				Weather Notations.								Temp. of the Sea.
			N.	S.	E.	W.	b.	c.	o.	m.	f.	r.	s.	q.	
	inches.	°													°
4 a.m. - -	29·554	29·4	7·4	20·5	25·5	0·7	2	8	5	4	1	1	2	—	30·0
8 „ - -	·574	30·5	5·8	14·9	29·9	0·4	2	7	6	3	2	—	1	—	30·4
Noon - -	·584	33·0	7·1	14·4	34·4	2·2	2	5	8	6	2	—	3	—	31·2
4 p.m. - -	·587	33·4	8·8	15·8	24·2	4·9	2	6	7	7	2	2	—	—	31·3
8 „ - -	·566	31·4	10·9	11·3	28·5	10·4	2	6	7	6	1	1	2	—	30·5
Midnight -	·561	29·8	7·5	14·0	29·0	11·7	2	7	6	2	—	1	3	—	30·0
Means - -	29·571	31·2	7·9	15·1	28·6	5·0	2	6	7	—	—	—	—	—	30·6

EXTREMES OF PRESSURE AND TEMPERATURE, with accompanying Wind and Weather.

—	Date.	Barometer.	Temp.	Wind.		Weather.
	d. h.	inches.	°			
Maximum pressure - -	28 20	29·98	29·0	E.S.E.	1	b c
Minimum „ - -	30 0	29·22	32·5	S.E.	5	c g
Maximum temperature - -	27 0	29·43	37·0	E.N.E.	4	c
Minimum „ - -	24 16	29·34	23·0	N.	3	c
Range in 15 days - -	—	0·76	14·0	—		—

Wind, force 8, was noted once. The W.N.W. winds were the strongest, and the E.S.E. the most frequent. The weather was thickest at mid-day. The pressure shows a maximum about 2 p.m., and a minimum about 4 a.m. The maximum temperature appears about 4 p.m., and the minimum about 4 a.m.

No. of obs. - 90.

Remarks from the Log.

17th, 8 a.m. - Anchored to the floe.
20th - - Shot three seals.
21st - - Shot two seals.
22nd - - Lat. 75° 22′, long. 62° 41′
24th - - Lat. 75° 20′, long. 63° 9′; current S. 74° W. 7½ miles in two days. Shot a seal.
26th - - Lat. 73° 23′, long. 63° 12′; current N. 3 miles in two days. Shot two *larus eburneus*.
27th - - Lat. 75° 26′, long. 63° 12′; current N. 3 miles. Shot three seals and one dotterel.
28th - - Shot three seals.
29th - - Lat. 75° 26′, long. 63° 55′; current W. 11 miles in two days.
31st - - Lat. 75° 30′, long. 64° 4′; current N. 30° W. 4½ miles in two days. Specific gravity of the sea-water, from 15 observations, 1·0241 reduced to temp. 60°.

1857.—SEPTEMBER.

Beset and drifting with the pack, between lat. 75° 28′ N., long. 64° 6. W., and lat. 75° 1′ N., long. 65° 23′ W.

Hour.	Barometer.	Temperature.	Wind Components: Sums.				Weather Notations.								Temp. of the Sea.	Ozone (mean).
			N.	S.	E.	W.	b.	c.	o.	m.	f.	r.	s.	q.		
	inches.	°													°	
4 a.m. - -	29·713	17·2	29·6	23·9	25·8	39·4	9	5	16	—	10	1	3	—	29·2	—
8 „ - -	·719	18·8	24·7	22·6	21·6	37·8	9	7	14	6	6	1	2	—	29·1	4·4
Noon - -	·731	22·1	30·9	24·7	26·4	31·1	11	7	12	4	3	1	3	—	30·0	—
4 p.m. - -	·733	23·1	28·5	30·5	32·8	30·5	10	7	13	—	5	1	3	—	29·8	—
8 „ - -	·731	19·6	30·2	27·1	18·2	37·1	9	7	14	2	5	1	2	—	29·5	4·3
Midnight -	·732	17·5	23·1	19·0	29·3	35·5	8	8	14	1	9	1	3	—	29·4	—
Means - -	29·727	19·7	27·8	24·6	25·7	35·2	9	7	14	—	—	—	—	—	29·5	—

EXTREMES OF PRESSURE AND TEMPERATURE, with accompanying Wind and Weather.

—	Date.	Barometer.	Temp.	Wind.		Weather.
	d. h.	inches.	°			
Maximum pressure - -	13 0	30·34	+17·0	W.	1	b c
Minimum „ - -	7 12	29·12	33·0	E.S.E.	6	s
Maximum temperature - -	2 4	29·62	+36·0	Calm		f
Minimum „ - -	17 12	30·04	− 2·0	W.N.W.	2	b
Range in month - -	—	1·22	38·0	—		—

Wind, force 8, was noted once. The W.S.W. winds were the strongest, and the N.W. the most frequent. The weather was clearest at mid-day. During the afternoon the wind was variable, inclining to S.E. The pressure shows a maximum at 4 p.m., and a minimum at 4 a.m., corresponding with the maximum and minimum of temperature.

No. of obs. - 180.

Remarks from the Log.

1st, Noon - Lat. 75° 28′, long. 64° 6′; current S. 2′; fast to floe. Four seals shot.
2nd - - Three seals shot.
3rd - - Three seals shot.
4th - - Two seals shot; two black whales seen.
5th - - At 10 a.m. sounded in 82 fms., temp. 29°·5, sp. g. 1·0282, mud.
At 50 „ „ 29 ·0 „ 1·0272
„ 25 „ „ 29 ·0 „ 1·0270
„ surface „ 28 ·8 „ 1·0245
5th - - Six seals shot.
6th - - Four seals shot; one black whale seen.
7th - - Moving a ship's length; sounded in 88 fathoms. One *tringa* shot.
8th - - Sounded in 88 and 96 fathoms.
9th - - Sounded in 88 fathoms. One falcon seen; two *larus glaucus* shot.

10th - - Sounded in 77½ and 83½ fathoms. One *larus glaucus* shot.
11th - - Sounded in 77 fathoms, mud and stones.
12th - - Sounded in 74 fathoms, mud and stones.
13th - - Lat. 75° 33′, long. 65° 32′; current N. 2′. Twenty-six bergs in sight. Three ravens, a burgomaster, and a turnstone seen.
14th - - Sounded in 71 fathoms. A turnstone shot, a burgomaster seen.
15th - - Current S. 73 E. 11′ in two days; lat. 75° 30′, long. 64° 52′. Three ravens, a burgomaster, three snow-buntings seen.
16th - - Sounded in 69 fathoms, stones. A seal shot.
17th - - Sounded in 94 fathoms, mud. Lat. 75° 32′, long. 66° 1′; current S. 77° W. 4½, in two days.
18th - - Lat. 75° 30′, long. 65° 39′; current S. 71° E. 6′.
19th - - At 2 a.m., slight aurora. Sounded in 114 fathoms, mud. Lat. 75° 28′, long. 65° 32′; current S. 42° E. 3′.
20th - - Lat. 75° 21′, long. 65° 24′; current S. 7′, E. 2′.
21st - - No bottom at 120 fathoms. Lat. 75° 17′, long. 65° 21′; current S. 4′, E. ¾′.
22nd - - At 2 a.m., slight aurora. Sounded in 135 fathoms, mud and sand. Lat. 75° 12′, long. 65° 12′; current S. 5′, E. 2¼′. Two bears seen.
23rd - - Sounded in 130 fathoms, soft mud. Lat. 75° 10′, long. 65° 5′; current S. 2′, E. 1¾′.
24th - - Sounded in 130 fathoms, mud. Lat. 75° 9′, long. 65° 20′; current S. 1½′, W. 4′. At 10 p.m., slight aurora in S.E.
25th - - At 2 a.m., slight aurora from N.N.W. to S.S.W. Lat. 75° 5′, long. 65° 20′; current S. 3½′. A raven shot; several seals and glaucous gulls seen.
26th - - Lat. 75° 4′, long. 65° 23′; current S. 1′, W. 1′.
27th - - At 2 a.m., slight aurora E. to S.E. Lat. 75° 1′, long. 65° 23′. One raven seen.
28th - - Sounded 140 fathoms, no bottom. Lat. 75° 2′, long. 65° 23′.
29th - - Lat. 75° 1′, long. 65° 23′. Two bears seen.
30th - - Lat. 75° 1′, long. 65° 23′.
1st to 4th - - The specific gravity of the sea water was 1·0240 from 4 observations. From 10 observations with the psychrometer the wet bulb was 0°·2 lower than the dry, which meaned 23°·3.

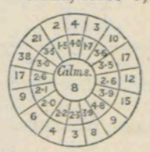
1857.—OCTOBER.

Beset and drifting with the pack, between lat. 75° N., long. 65° 23′ W., and lat. 74° 50′ N., long. 69° 30′ W.

Hour.	Barometer.	Temperature.	Wind Components: Sums.				Weather Notations.								Ozone. Mean.
			N.	S.	E.	W.	b.	c.	o.	m.	f.	r.	s.	q.	
	inches.	°													
4 a.m. - -	29·732	4·3	34·6	20·4	40·5	43·9	4	11	16	7	2	—	6	—	—
8 „ - -	·725	6·3	35·2	20·1	26·4	44·7	5	11	15	7	3	—	6	—	8·1
Noon - -	·757	7·4	29·0	18·5	33·7	42·0	7	9	15	7	2	—	3	—	—
4 p.m. - -	·765	6·5	21·3	19·7	32·1	32·7	6	13	12	5	4	—	5	—	—
8 „ - -	·769	5·3	23·0	10·7	34·7	35·7	7	9	15	5	4	—	7	—	7·2
Midnight -	·760	4·3	24·8	23·8	44·1	34·1	7	8	16	6	3	—	7	—	—
Means - -	29·751	5·7	28·0	18·9	35·2	38·9	6	10	15	—	—	—	—	—	—

EXTREMES OF PRESSURE AND TEMPERATURE, WITH ACCOMPANYING WINDS AND WEATHER.

—	Date.		Barometer.	Temp.	Wind.		Weather.
	d.	h.	inches.	°			
Maximum pressure - -	26	0	30·522	− 7·0	S.W.b.W.	1	b c
Minimum „ - -	22	0	29·056	+ 1·5	W.b.N.	9	o
Maximum temperature -	14	0	29·218	+32·0	E.S.E.	8	s m
Minimum „ - -	28	16	29·990	−12·0	E.N.E.	2	v
Range in month - -	—		1·466	44·0	—		—



No. of obs. - 186.

Wind, force 8, was noted 11 times. The S.E. winds were the strongest, the W.N.W. the most frequent. There is a tendency for the wind to veer from N.W. whence it is most persistent about 8 a.m., to S.E. about 4 p.m., so that in the afternoon the wind resultant is almost *nil*; and at midnight the resultant is from E. The duration of daylight was about 11 hours. The pressure shows a maximum about 8 p.m. and a minimum about 8 a.m. The maximum temperature was at noon, the minimum about 2 a.m. The sky was clearest at 4 p.m., least so at 4 a.m.

REMARKS from the LOG.

1st - - At 2 a.m. many shooting stars. A flock of eider ducks seen, a raven, and a ptarmigan alighting near the ship was devoured by the dogs.
4th - - Lat. 74° 57′, long. 65° 52′; current S. 2′. At 11.15 p.m., slight aurora S.S.W.
5th - - Lat. 74° 54′, long. 65° 52′; current S. 3′.
6th - - Sounded in 140 fathoms. Lat. 74° 52′, long. 65° 45′; current S. 1½′. At 4 p.m., depth of fresh-water hole in middle of floe, 2·9 feet; at 16½ inches in the water, temperature, 31°.
7th - - At 2 a.m., a polariscope applied to halo round the Moon; slight polarisation at angle of 45°. Two bear tracks seen near the ship.
9th - - At 4 p.m. aurora from E.S.E. to S.S.E. A raven seen.
10th - - At 8 p.m. a polariscope applied to luminous haze round the Moon; three diameters of Moon in extent. Slight polarisation of image on right hand, instrument held horizontal, mark on eye-end to the left hand. On moving instrument through 70° equal image [2|1] → ⊙, 1 brighter than 2.
12th - - A company of ducks going E. At midnight, one or two shooting stars.
14th - - At 8 a.m., hard gales with much snowdrift. At noon, a lane of water opening S.S.W. to S.S.E.
16th - - Thickness of young ice, mean of six observations, 1 foot 3·8 inches. Thickness of snow for last three weeks 2½ inches. Sounded in 165 fathoms; no bottom.
22nd - - Ozone papers have been used hourly to-day. Greatest amount at 9 p.m., least at 11 a.m.
23rd - - A fox track seen. One seal seen.
28th - - At 10 p.m., one or two shooting stars. Midnight, ice in motion and opening near the ship.
29th - - A lane of water ahead of ship. At 8 p.m., ice in motion and considerable pressure on the ship.
30th - - At 4 a.m., slight aurora from S. to S.S.E. At 8 p.m., ice in motion.
31st - - At 4 a.m., wide lanes of water in all directions covered with bay ice; 8 p.m., ice in motion and lanes of water increasing.

1857.—NOVEMBER.

Beset and drifting with the pack, between lat. 74° 34′ N., long. 68° W., and lat. 75° 13′ N., long 69° 40′ W.

Hour.	Barometer.	Temperature.	Wind Components: Sums.				Weather Notations.								Ozone. Mean.
			N.	S.	E.	W.	b.	c.	o.	m.	f.	r.	s.	q.	
	inches.	°													
4 a.m. - -	29·643	−4·6	40·2	25·4	37·3	65·1	4	8	18	15	—	—	3	—	—
8 „ -	·649	4·9	30·5	19·9	30·1	59·8	5	11	14	13	1	—	4	—	9·2
Noon - -	·654	4·4	26·4	25·6	32·8	47·8	6	12	12	8	—	—	2	—	—
4 p.m. - -	·645	4·5	18·5	31·3	24·0	51·7	7	13	10	10	—	—	1	—	—
8 „ - -	·650	5·2	21·9	28·8	25·7	62·2	7	10	13	17	—	—	1	—	8·5
Midnight -	·656	−6·1	24·8	21·9	20·2	60·5	7	7	16	15	—	—	2	—	—
Means - -	29·650	−4·9	27·0	25·5	28·4	57·9	6	10	14	—	—	—	—	—	—

EXTREMES OF PRESSURE AND TEMPERATURE, WITH ACCOMPANYING WINDS AND WEATHER.

—	Date.		Barometer.	Temp.	Wind.		Weather.
	d.	h.	inches.	°			
Maximum pressure - -	30	8	30·167	−29·0	N.W.b.W.	1	b v
Minimum „ - -	16	8	28·801	+11·0	S.W.	2	s
Maximum temperature -	22	4	29·234	+30·5	S.E.	3	b c
Minimum „ - -	30	12	30·164	−32·0	N.W.b.W.	1	b v
Range in month - -	—		1·366	62·5	—		—

The wind reached force 8 and upwards on 14 observations. The winds were strongest from E.N.E., and most frequent from W.N.W. Snowdrift was noted at 25 observations. The pressure shows maxima at noon and midnight, and minima at 4 a.m. and p.m. Temperature shows very little range, the maximum occurring about 2 p.m., the minimum at midnight. The weather was clearest after noon, and least clear after midnight. The mean duration of daylight was 5h. 30m.

No. of obs. - 180.

REMARKS from the LOG.

2nd - - A bear killed, length from tip to tip 7 feet 3 inches.

6th - - A seal and an "usuk" seen. Ice in motion and lanes opening to S.W. and N.W.

7th - - At 4 a.m., lanes of water in all directions. Two dovekies in winter plumage shot. At midnight, faint aurora in S.W. about 28° in extent, pale yellow; at times oscillating and decreasing in extent to 14°; in breadth about 25°. Cloudy night with dim moonlight and few stars, if any at all.

8th - - Several seals seen. At midnight, aurora slight, horizontal from N.N.E. to N.N.W.

9th - - Water melted from the floe had specific gravity ·989 at 60°. Ice opening and closing. Several seals seen. At 8 p.m., several falling stars and faint lunar bow. At 11.30 p.m., pale yellow to pale green aurora extending from E. to S., with vertical rays streaming towards the zenith. It was about 7° above horizon, rising apparently just above a bank of fog, which latter gradually rose and obscured it at 12.45. No vibration or scintillation, but at times broken up into detached pieces.

10th - - Several seals and one dovekie seen.

11th - - Two seals shot. At 8 p.m., slight aurora to S.E. Midnight, faint to S.E. Several shooting stars, some very quick, others quite slow.

12th - - Three seals shot.

13th - - Ice in motion.

14th - - Ice in motion; old floes breaking up; bay ice in all directions.

15th - - Ice moving, and several large pools of water. Many seals seen; one shot.

16tn - - Mean thickness of ice 2 feet ½ inch, increase for the month 8¾ inches; thickness of snow 5½ inches, increase for the month 2¾ inches. One seal shot; one dovekie seen.

18th - - Several seals and narwhals; also three dovekies seen.

23rd - - At 8 p.m., aurora in S.E. Midnight, it was very bright round S.W. horizon, from N.W. to S.E.

24th, - - At 2 a.m. aurora in S.E.

1857.—DECEMBER.

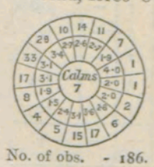
Beset and drifting with the pack, between lat. 74° 41′ N., long. 69° 10′ W., and lat. 73° 54′ N., long. 66° W.

Hour.	Barometer.	Temperature.	Wind Components: Sums.				Weather Notations.								Ozone. (Mean.)
			N.	S.	E.	W.	b.	c.	o.	m.	f.	r.	s.	q.	
	inches.	°													
4 a.m. - -	29·567	−22·4	37·4	26·6	19·0	35·1	8	5	18	18	—	—	2	—	—
8 „ - -	·555	21·3	44·3	27·0	8·5	41·7	10	7	14	18	—	—	1	—	9·1
Noon - -	·558	21·4	32·8	26·1	6·8	49·5	11	9	11	12	—	—	3		—
4 „ - -	·566	21·7	29·6	24·5	6·8	47·3	12	9	10	13	—	—	2	—	—
8 „ - -	·575	21·4	33·5	16·7	11·1	42·5	17	4	10	12	—	—	2	—	8·2
Midnight - -	·566	−22·5	30·4	19·7	15·0	34·5	15	8	8	12	—	—	2	—	—
Means - -	29·565	−21·8	34·7	23·4	11·2	41·8	12	7	12	—	—	—	—	—	—

EXTREMES OF PRESSURE AND TEMPERATURE, WITH ACCOMPANYING WINDS AND WEATHER.

—	Date.		Barometer.	Temp.	Wind.		Weather.
	d.	h.	inches.	°			
Maximum pressure - -	0	20	30·208	−31·0	N.W.b.W.	1	b v
Minimum „ - -	28	12	28·759	− 7·0	S.E.b.S.	6	m c s
Maximum temperature -	28	8	28·762	+ 5·0	N. -	5	m c s
Minimum „ - -	31	4	29·716	−36·5	W.N.W.	2	b v
Range in month - -	—		1·449	41·5	—		—

Wind, force 8 and upwards, was noted 8 times. The strongest winds were from S.S.E., and the most frequent from W.N.W. The maximum pressure was at 8 p.m., and the minimum at 8 a.m. The diurnal range of temperature was very small. The air was clearest about 8 p.m., and most obscured at 4 a.m. Snowdrift was noted at 22 observations. The mean duration of daylight was 1h. 30m.



No. of obs. - 186.

Remarks from the Log.

4th - - At 6 p.m., well marked paraselenæ, a complete horizontal belt of light, six moons in it, east.

7th - - Several cracks near the ship; one seal seen.

9th - - At 4 p.m., a thermometer placed inside snow-house −14°·5, outside −33°, difference 18°·5; thickness of the floor of snow 2 feet. Midnight, aurora E.N.E. to E.S.E., and several shooting stars.

10th - - At 10 p.m., a faint aurora in S., streaming towards the zenith.

12th - - At 2 a.m., slight aurora in S. At 10 p.m., faint aurora N.W.

13th - - At 6 p.m., bright aurora in S.E. Midnight, faint aurora S.E. to N.E., part of an arch with rays towards the zenith.

14th - - At 8 a.m., on attaching a gold-leaf electroscope to a wire from masthead to deck, found a sensible divarication of the leaves; blue sky, no clouds. Midnight, faint aurora from E. to N.E.

15th - - Lat. 74° 10′, long. 67° 8′; current S. 5′. Mean thickness of ice 3 feet, increase during the month 11½ inches. Mean thickness of snow 6½ inches, increase during the month 1¼ inch. From 5 to 6 p.m., several shooting stars. At midnight, faint aurora in S.

17th - - At 6 p.m., a slight aurora from E. to N. At 10 p.m., a bright aurora from S. to N.E.

18th - - At 4 a.m., aurora continues; ceased at 10 a.m. At noon, electroscope applied to wire at end of yard-arm, when distinct separation of the gold leaves appeared. At 6 p.m., aurora from E. to W. and N.W. across the zenith, visible for an hour with sensible effect upon the electroscope. At 8.30 p.m., aurora from S.S.E. to N.N.E.; again divergence of the gold leaves.

19th - - At noon, a wide crack opened about half a mile N.W. from the ship, extending N.E. and S.W. At 4 p.m., found an evident effect upon the electroscope; no appearance of clouds. At 8 p.m., no effect on electroscope; light haziness. At 11 p.m., electroscope affected weakly; very hazy.

20th - - At noon, electroscope affected. At 8 p.m., not affected. Weather "m s" at both trials.

24th - - At 4 a.m., narrow lanes of water recently opened to S.W. and N.W. of the ship, distant ¼ to 1 mile.

28th - - At 8 p.m., wind veered from N.N.E. to S.b.E. passing through E.

29th - - Small lanes of water near the ship.

1858.—JANUARY.

Beset and drifting with the pack, between lat. 73° 50′ N., long. 65° 47′ W., and lat. 72° 28′ N., long. 61° 10′ W.

Hour.	Barometer.	Temperature.	Wind components: Sums.				Weather Notations.								Ozone. (Mean.)
			N.	S.	E.	W.	b.	c.	o.	m.	f.	r.	s.	q.	
	inches.	°													
4 a.m. - -	29·519	−25·7	63·6	13·8	11·3	53·8	10	6	15	17	—	—	5	—	—
8 „ - -	·521	25·3	56·3	11·6	11·0	52·0	9	8	14	17	—	—	7	—	7·8
Noon - -	·531	24·7	50·4	7·4	10·0	57·7	11	8	12	13	—	—	3	—	—
4 p.m. - -	·538	25·6	49·3	8·9	11·5	54·5	11	12	8	11	—	—	2	—	
8 „ -	·541	25·6	51·4	10·3	13·1	55·1	13	10	8	12	—	—	1	—	8·2
Midnight	·528	−25·5	59·3	10·8	10·2	45·1	14	5	12	13	—	—	1	—	—
Means - -	29·530	−25·4	55·1	10·5	11·2	53·0	11	8	12	—	—	—	—	—	—

EXTREMES OF PRESSURE AND TEMPERATURE, with accompanying Winds and Weather.

—	Date.		Barometer.	Temp.	Wind.		Weather.
	d.	h.	inches.				
Maximum pressure - -	30	4	30·908	−36·0	E.S.E.	1	b c
Minimum „ - -	3	8	28·672	+24·0	N.W.	3	b v
Maximum temperature -	15	4	29·767	+ 8·0	N.E.b.N.	3	m
Minimum „ - -	29	8	30·499	−47·5	E.b.S.	1	b c
Range in month - -	—		2·236	39·5	—		—

Wind, force 8 and upwards, was noted 5 times. The strongest winds were from N.W., the most frequent N.N.W. The maximum pressure was about 6 p.m., and the minimum about 6 a.m. The mean diurnal range of temperature is very small. The mean length of daylight was 4½ hours. It would seem that the atmosphere was clearest at 6 p.m., the time of maximum pressure, and least clear at 6 a.m., the time of minimum pressure. Snowdrift was noted at 29 observations.

No. of obs. - 180.

Remarks from the Log.

1st - - At noon, the temperature of an empty snow-hut −16°, external air −34°.

5th - - Pools of water in N.W., extending N.E. and S.W. A seal seen.

6th - - At 2 a.m., faint double paraselenæ.

9th - - At 8 p.m., bright aurora from N. to S. At 10, slight from all points of the horizon or not stationary. Midnight from N.W. to S.E.

10th - - Lat. 73° 30′ 31″, long., 64° 9′ 30″.

11th - - At 8 p.m., aurora near S.W. horizon.

12th - - At 8 p.m., a patch of aurora 8° above horizon in S.b.E.

13th - - Lat. 73° 24′ 11″, long. 63° 54′.

15th - - Mean thickness of ice 3 feet 7½ inches, increase for month 7½ inches; mean thickness of snow 8½ inches, increase for month 2 inches.

17th - - At 8.30 p.m., auroral arch from S. to E., about 9° above horizon in centre, 3° at extremities, with short rays towards zenith. At 10.45, aurora again appeared in same place. Ceased at 2 a.m.

18th - - Lat. 73° 9′ 14″, long. 63° 34′ 45″.

25th - - From 6 to 7.30 p.m., halo round the Moon.

26th - - Lat. 72° 47′ 37″, long. 62° 35′ 30″.

28th - - Lat. 72° 46′ 17″, long. 62° 0′ 45″. The Sun rose at 11h. 25m., mean time; 89 days absent.

30th - - A broad lane of water running N. and S., about 3½ miles to S.E. of ships. A small pool of water to N.W. of ship about 3 miles. Two seals, one dovekie seen.

31st - - At 4 p.m., horizon much elevated by refraction. A narrow lane of water about 2½ miles S.E. of ship. One seal and some dovekies seen.

1858.—FEBRUARY.

Beset and drifting with the pack between lat. 72° 30′ N., long. 61° 10′ W., and lat. 69° 50′ N., long. 59° 44′ W.

Hour.	Barometer.	Temperature.	Wind Components: Sums.				Weather Notations.								Ozone. (Mean.)
			N.	S.	E.	W.	b.	c.	o.	m.	f.	r.	s.	q.	
	inches.	°													
4 a.m. - -	29·627	−16·4	104·2	11·6	11·1	50·0	11	12	5	11	—	—	2	—	—
8 „ - -	·620	15·1	92·4	11·6	10·0	42·6	11	12	5	7	—	—	3	—	8·6
Noon - -	·655	14·4	78·9	10·0	4·7	38·2	13	10	5	5	—	—	1	1	—
4 p.m. - -	·665	14·8	80·1	5·4	7·6	39·4	11	10	7	8	—	—	5	—	—
8 „ - -	·665	15·2	82·1	8·3	4·7	45·3	8	16	4	12	—	—	3	—	8·3
Midnight - -	·643	−16·1	93·2	9·8	8·8	43·6	9	14	5	13	—	—	3	—	—
Means - -	29·646	−15·3	88·5	9·5	7·8	43·2	11	12	5	—	—	—	—	—	—

EXTREMES OF PRESSURE AND TEMPERATURE, WITH ACCOMPANYING WINDS AND WEATHER.

—	Date.		Barometer.	Temp.	Wind.		Weather.
	d.	h.	inches.	°			
Maximum pressure - -	13	4	30·300	− 8·0	N.N.W.	3	b c
Minimum „ - -	17	20	29·006	− 5·0	N.	6	b c
Maximum temperature - -	28	0	29·962	+11·0	S.S.E.	4	c
Minimum „ - -	8	0	29·809	−41·0	N.	2	b v
Range in month - -	—		1·294	52·0	—		—

Wind, force 8 and above, was noted 20 times. The N.W. winds were the strongest, and the N. the most frequent. The weather was clearest at noon, most hazy at midnight. The pressure shows a maximum about 6 p.m., a minimum about 6 a.m. The maximum temperature occurs about 2 p.m., the minimum 2 a.m. The mean duration of daylight was 10 hours. Snow-drift was noted at 70 observations.

No. of obs. - 168.

REMARKS from the LOG.

1st - - A sooty fox shot.

2nd - - Several bear tracks in the neighbourhood. Lat. 73° 28′ 28″, long. 61° 9′ 35″; no bottom at 170 fathoms; at 110 fathoms 29°·5, sp. g. 1·0261; at 5 fathoms, 28°·5, sp. g. 1·0257. At 9 p.m., faint aurora in S.E. horizon for 10 minutes. At 10 p.m., faint aurora from S.E. to E.N.E., an arch, 28° above horizon, extremity touching horizon; S.E. extremity brightest, with occasional streams towards zenith; ceased at midnight.

3rd - - At 8 p.m., a broad crack, running N.E. to S.W., half a mile to north of ship. At 11, a band of aurora from S.E. horizon to zenith, visible for 15 minutes. Ice in motion.

4th - - Lat. 72° 24′ 48″, long. 61° 10′. Ice opened in several places. Several seals and dovekies seen. Thermometer inserted perpendicularly 4 feet in a large snow-bank, touching the hummocks of ice below, enclosed 24 hours, +25°.

5th - - Thermometer in snow-bank horizontally, 4 feet from air, 3 feet from ice below, 3 feet from top of bank, enclosed 24 hours, −4°; temperature in snow-hut −13°; external air −25°·5 Six dovekies shot. The floe appears to have a lateral motion respecting S.W. and N.E., the northern ice going to S.Wd., the southern floes to N.Ed., or *vice versâ*, and the point of contact near the ship. Lanes are opening in the same direction, and the edges seem moving in the same. An old floe has cracked in several places, the nearest fissure being 15 fathoms astern.

6th - - Inserted thermometer for 24 hours in snow-bank, 4 feet from ice, 2½ feet from upper surface of bank, and 4 feet from outside of bank horizontally, −10°·5, external air mean −21°·5. At 9 p.m., a heavy nip 400 yards north of ship; no water visible. Mean of eight observations: thickness of floe 4 feet 5¼ inches; of superposed snow 9½ inches; new floe, formed when we were being froze in, 3 feet 7 inches; superposed snow 8½ inches. At midnight, slight aurora in N.E.

7th - - Thermometer in snow-bank 24 hours, horizontally 4 feet, 3 feet from ice, and 3 feet from top of bank, −2°·5; mean of external air −24°·5. At 9.45 p.m., pale streaks and patches of aurora from S.S.E. to N., apparent for 45 minutes.

8th - - Lat. 70° 22′ 22″, long. 61° 26′.

9th - - At 11 a.m., faint parhelia. At 10 p.m., aurora from N.E. to S.E.

10th - - At 2 a.m., slight aurora from N. to S., passing through the zenith.

11th - - A broad lane of water running E.N.E. and W.S.W., nearest part one mile astern of ship.

12th - - Two seals seen.

13th - - At 4 a.m., slight patch of aurora W. At noon, lat. 71° 59′ 16″, long. 60° 26′ 15″, a well-marked prismatic halo round the Sun. Several seals seen. Midnight, aurora S.S.E. to E. about 4° above horizon, with streamers half way to zenith.

14th - - Two dovekies seen. Noon to 1.30 p.m., part of an ill-defined halo round the Sun, diameter about 45°; the extremities near horizon prismatic. At 8 p.m., ice opening in the lane two miles N.W. of ship.

15th - - From 10 a.m. till 3 p.m., imperfect halos round the Sun, diameters 45° to 90°. Lat. 71° 33′ 30″, long. 60° 31′ 30″. From 6.30 to 8.45 p.m., pale auroral arch, 4° above horizon, from S.S.E. to E.N.E., with streamers towards zenith.

16th - - At 10 a.m., slight prismatic imperfect halo round the Sun. At 7.30 p.m., bright pale yellow aurora from S.E. to N., form of an arch, at times double and even treble, varying from 6° to 8° above horizon, with streamers towards zenith, having gradually shifted from S. to E.N.E.; it ended at 1.50 a.m.

17th - - Lat. 71° 15′ 40″, long. 60° 45′; thickness of ice 3 feet 9 inches, increase in a month 1½ inch; thickness of snow 9½ inches, increase in a month 1 inch. At 10 a.m., imperfect prismatic halo round the Sun, 45° in diameter; another fainter and external, about 90° diameter. At 4 p.m., a lane of water E.N.E. and W.S.W., 2 miles N. of ship, in which several seals were seen. At 8 p.m., halo round Moon, diameter about 46°. From 9.45 to 10 p.m., patch and arch of aurora S.S.W. to S.S.E., about 4° above horizon.

18th - - At 4 a.m., an aurora from S.W. to E. during middle watch. At noon, halo round the Sun, diameter about 45°. At 8.30 p.m., auroral arch about 15° above horizon from S.S.E. to E.

19th - - Lat. 71° 1′ 57″, long. 60° 48′ 15″. At 11.30 p.m., auroral arch from S.S.E. to N.E., 9° above horizon.

20th - - New ice 2 miles north of ship opened a wide lane of water E.N.E. and W.S.W., extending beyond visible horizon. At 6 p.m., a prismatic cloudy halo round Moon, diameter 4° 20′.

21st - - Ice closing in the late crack N. of ship. A fox track seen.

22nd - - A wide lane of water running E.N.E. and W.S.W. 2½ miles N. of ship. Several seals and two dovekies seen, also a very recent bear track. No bottom at 180 fathoms; at 120 fathoms 32°·5, sp. g. 1·0253; at surface 29°, sp. g. 1·0258. At 10 p.m., a halo round the Moon, diameter about 45°.

23rd - - Lat. 70° 39′ 21″, long. 60° 34′ 45″.

24th - - At 10 p.m., the ship lifted slightly, and the floe cracked in a line with the ship.

27th - - At 9 a.m., snow observed to melt against the ship's side; temperature in shade —22°·5. Several lanes of water in sight. One seal shot. At noon, black-bulb thermometer in sunshine —7°, thermometer in shade —17°·5.

28th - - Lat. 69° 50′ 24″, long. 59° 43′ 30″. At midnight, halo round the Moon, diameter about 43°, Moon's altitude 19° 38′.

1858.—MARCH.

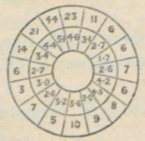
Beset and drifting with the pack, between lat. 69° 50′ N., long. 59° 44′ W., and lat. 68° 20′ N., long. 58° 47′ W.

Hour.	Barometer.	Temperature.	Wind Components: Sums.				Weather Notations.								Ozone. (Mean.)
			N.	S.	E.	W.	b.	c.	o.	m.	f.	r.	s.	q.	
	inches.	°													
4 a.m. - -	29·890	—6·0	73·4	33·9	19·9	45·1	11	13	7	7	1	—	3	—	—
8 „ - -	·883	—3·5	70·5	32·0	18·1	42·6	12	9	10	9	—	—	5	—	7·4
Noon - -	·914	+0·5	69·1	19·1	14·4	41·2	11	10	10	9	1	—	7	—	—
4 p.m. - -	·905	—0·1	74·0	16·2	17·9	35·1	11	14	6	7	—	—	4	—	—
8 „ - -	·901	4·5	77·7	15·0	21·9	41·6	12	12	7	4	2	—	2	—	7·0
Midnight -	·888	—6·1	81·9	19·9	20·4	40·0	14	10	7	6	2	—	6	—	—
Means - -	29·897	—3·3	74·4	22·7	18·8	40·9	12	11	8	—	—	—	—	—	—

EXTREMES OF PRESSURE AND TEMPERATURE, WITH ACCOMPANYING WINDS AND WEATHER.

—	Date.		Barometer.	Temp.	Wind.		Weather.
	d.	h.	inches.	°			
Maximum pressure - -	6	16	30·768	—27·0	N.W.b.N.	1	b v
Minimum „ - -	10	20	28·666	+29·0	S.E.b.E.	5	m s
Maximum temperature -	11	0	28·695	+32·0	S.E.b.E.	4	m s
Minimum „ - -	31	12	30·023	—27·5	W.b.N.	2	b
Range in month - -	—		2·102	59·5	—		—

Wind, force 8 and upwards, was noted 18 times. The strongest and most frequent winds were from N.N.W. There is a remarkable rise of the mean pressure from 8 a.m. to noon, whence it gradually falls. This rise is accompanied by marked decrease in the S. component of the wind. The temperature was highest at noon, lowest at midnight. There was also a very large monthly range in the barometer and thermometer. Snowdrift was noted at 20 observations. The weather was clearest at midnight, most overcast at noon.



No of obs. - 186.

REMARKS from the LOG.

1st - - Lat. 69° 50′ 24″, long. 59° 43′ 30″; sounded in 180 fathoms; at 120 fathoms 34°·5, sp. g. 1·0278; at 5 fathoms, 30°.

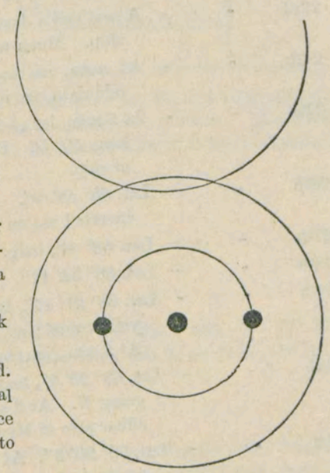
2nd - - A lane of water opened a mile N. of ship, running E.N.E. and W.S.W. At 10.30 p.m., patches, arches, and streams of aurora from S.W. to S. and E.; ceased at 2.30 a.m.

3rd - - Several lanes and cracks in ice N. of ship. Several seals, narwhals, and dovekies seen. Hail fell from 10 till 11 p.m.

4th - - Between 12 and 1 a.m. wind shifted from N.E.b.E. to E. and S.S.W. At 10 p.m., slight aurora from S. to W.N.W., broad arch reaching almost to zenith.

5th - - Lat. 70° 3′ 36″, long. 59° 35′. At noon, black-bulb thermometer 0°, temperature in shade —10°. At 2 p.m., the ice became suddenly detached from the ship's bows and sides as far aft as the mizen-mast, allowing her to rise 11 inches forward. At 7 p.m., patches and streams of aurora S.W. and S. to N.W., visible for seven hours.

6th - - At noon, black bulb —10°·5, in shade —16°. At 8 p.m., bright aurora from S.S.W. to E., bands and arches varying from 8° to 50° above horizon, with streamers towards zenith; ceased at 10.30.



7th - - Lat. 69° 55′ 14″, long. 59° 18′ 30″; 11 a.m. to 2 p.m., double prismatic halo (red external) round the Sun, diameter 45° and 90° nearly, with part of an inverted arc on top of outer halo (see figure).

8th - - Lat. 69° 49′ 3″, long. 59° 18′ 30″. A lane of water N.W. of ship, in which several seals and narwhals were seen. At 9 p.m., faint aurora in S.E.

9th - - A bear chased; many seals, dovekies, and a black whale seen.

10th - - Lat. 69° 41′ 24″, sounded in 170 fathoms, mud. Two seals shot; some narwhals seen. Several pools of water N. of ship. At 1 p.m., the ice cracked about 100 yards astern, and open to 10 or 12 yards.

11th - - Ice much broken up, lanes and pools of water in all directions to N. of ship.

12th - - Water-pools in sight all round. A seal shot.

14th - - Lat. 69° 55′ 27″, long. 60° 14′ 45″, several pools and lanes of water N. of ship.

15th - - At 10.30 p.m., patch of aurora from S. to S.E., about 8° above horizon.

16th - - Lat. 69° 38′ 5″, long. 59° 24′ 45″; ice 4 feet 3½ inches thick, increase for month 6½ inches; means of six measurements of snow, 9 inches; no increase. Ice opened a cable's length W. of ship and formed a lane running nearly N. to S. as far as eye can reach. At 10 p.m., band of aurora from S.b.W. to N.E., from 8° to 10° above horizon, with streamers towards zenith; ceased at midnight.

17th - - Lat. 69° 31′ 15″, several seals seen; three dovekies shot. Ice much broken up, and several wide lanes running N. and S. in sight from aloft. At 10 p.m., bright aurora from S.W. to E.N.E.

18th - - Lat. 69° 27′ 31″, long. 59° 5′ 45″, ice in cracks W. of ship, and in motion; a seal shot. At noon, double halo round the Sun; diameter of inner 45°, of outer 90°, altitude of Sun 19°, both prismatic, red internal. Two parhelia on the inner halo, with a pencil of rays joining them with the outer circle; polariscope applied. At 4.30 p.m., the lane W. of ship closed, and the floe edges meeting, having a relative N. and S. movement, caused a severe pressure. At 11 p.m., the ice open W. of ship. The tracks of two bears and a cub seen, travelling S. At 11 p.m., aurora from S.b.E. to E.N.E. about 10° above horizon, with streamers towards zenith.

19th - - Several seals and dovekies seen. At noon, faint halo with two parhelia. From 6 to 11 p.m., ice in motion.

20th - - At 2 a.m., ice opened in lanes W. of ship. Lat. 69° 14′ 30″, long. 58° 55′ 15″, sounded 150 fathoms, soft mud; at 90 fathoms 34°, sp. g. 1·026; at 4 fathoms 29°·5, sp. g. 1·026.

21st - - Lat. 69° 14′ 25″, ice opening in lanes W. of ship; two dovekies and a seal shot.

22nd - - Six dovekies shot. At 10.30 p.m., the ice suddenly became detached from the ship, and allowed her to heel over to the gale, E.S.E., force 10; fog and snowdrift.

23rd - - A seal and a dovekie shot. A large pool of water in the nearest point 65 yards W. of ship. Much water in sight to the Sd. from aloft.

24th - - At noon, ice apparently drifting fast to S., and opening in different directions. At midnight, ice in motion and pressing on the floe edge W. of ship.

25th - - At 2 a.m., ice easing off and opening in cracks 60 yards W. of ship. Lat. 69° 16′ 7″, long. 59° 5′. From 6 to 8 p.m., ice in motion and squeezing heavily in crack W. of ship.

26th - - Lat. 68° 59′ 9″. At 9 p.m., halo round the Moon, diameter about 44°, with part of inverted arc on top, not prismatic; Moon's altitude 28°.

27th - - Lat. 68° 44′, long. 58° 52′ 15″. At 9 p.m., ice opening in lanes W. of ship.

28th - - Lat. 68° 34′ 17″. At 6 a.m., ice closing; 6 p.m., opening.

29th - - Lat. 68° 27′ 17″, long. 58° 45′; lead lowered 180 fathoms, supposed bottom 170 fathoms, yellow mud; at 120 fathoms 38°, sp. g. 1·0283; at 4 fathoms 30°·5, sp. g. 1·0255. At 2 a.m., ice closing; 4.30 p.m., opening.

30th - - Lat. 68° 25′ 9″, long. 58° 46′ 45″; one seal, two dovekies shot; many narwhals seen going N. At 8 a.m., ice closed; 2.30 p.m., ice opening. At midnight, paraselenæ on either side of Moon and one on top, distant from Moon about 23°; Moon's altitude 11°.

31st - - Lat. 68° 20′ 3″. At 8 a.m., ice closed in crack near ship with slight pressure. At 10 p.m., track of a large bear near the ship.

1858.—APRIL 1st to 26th.

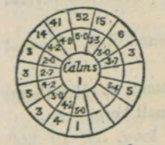
Beset and drifting with the pack, between lat. 68° 17′ N., long. 58° 33′ W., and lat. 63° 47′ N., long. 56° 36′ W.

Hour.	Barometer.	Temperature.	Wind Components: Sums.				Weather Notation.								Ozone. Mean.
			N.	S.	E.	W.	b.	c.	o.	m.	f.	r.	s.	q.	
	inches.	°													
4 a.m. - -	29·885	−0·1	102·9	7·2	12·6	25·9	10	11	5	6	—	—	3	4	—
8 „ - -	·883	+4·7	100·8	9·1	9·3	25·3	10	9	7	7	—	—	6	3	6·5
Noon - -	·888	10·4	104·8	8·4	11·9	25·7	12	9	5	6	1	—	4	4	—
4 p.m. - -	·893	9·6	100·4	8·9	12·1	27·6	11	10	5	7	—	—	4	4	—
8 „ - -	·910	4·7	95·6	6·5	12·1	27·8	12	9	5	6	—	—	3	3	6·3
Midnight -	·909	+2·5	101·0	6·1	10·3	29·5	11	10	5	6	—	—	4	3	—
Means - -	29·895	+5·3	100·9	7·7	11·4	27·0	11	10	5	—	—	—	—	—	—

EXTREMES OF PRESSURE AND TEMPERATURE, WITH ACCOMPANYING WINDS AND WEATHER.

—	Date.		Barometer.	Temp.	Wind.		Weather.
	d.	h.	inches.	°			
Maximum pressure - -	12	4	30·656	−1·5	N.	3	b c
Minimum „ - -	25	0	29·180	+34·0	N.N.W.	3	b m s
Maximum temperature -	25	0	29·180	+34·0	N.N.W.	3	b m s
Minimum „ - -	0	16	30·011	−26·5	W.b.N.	3	b c
Range in month - -	—		1·476	60·5	—		—

Wind, force 8 and upwards, was noted 23 times. The strongest winds were from the N., and they were the most frequent. The maximum pressure was at 8 p.m., the minimum at 8 a.m. Snowdrift was noted at 33 observations. The temperature of the sea was 29·2° from observations made on six days, 19th to 26th.



No. of obs. 156.

REMARKS from the LOG.

1st - - At 6 a.m., a wide lane of water opening 2 miles N.E. of ship. Lat. 68° 17′ 17″ long. 51° 32′ 30″. At midnight, a band of aurora from S.S.E. to S.W., 8° above horizon, with streamers towards the zenith.

2nd - - Lat. 68° 17′. Two whales seen.

3rd - - Lat. 68° 8′ 55″, long. 58° 42′ 45″.

4th - - At noon the ice opened into a lane, about 60 yards wide, separating the boats from the ship, running about N.N.E. and S.S.W., the nearest point about 20 yards from the ship.

5th - - At 2 a.m., the floes cracked in a line with the ship. At 8 p.m., ice stationary.

6th - - Lat. 67° 18′ 26″, long. 58° 36′ 15″; much water in sight to E. and N.E.; four seals shot; one black whale and some narwhals seen.

7th - - Tried for soundings, no bottom at 170 fathoms; at 110 fathoms 34°, sp. g. 1·0277; at 5 fathoms 30°, sp. g. 1·0255.

8th - - The recent tracks of two bears and cub seen on the bay ice, going westward, about 2½ miles S. of the ship.

9th - - Lat 66° 53′ 20″, long. 58° 51′ 15″. A walrus seen. At 11 p.m., pale auroral streamers from E. to N. stretching from 10° above horizon to zenith.

10th - - Lat. 66° 45′ 15″, long. 58° 40′ 45″. No bottom at 180 fathoms; at 120 fathoms 34°, sp. g. 1·0272; at 4 fathoms 30°, 1·0255. At midnight, faint aurora from S. to E.

11th - - During the night two bears had been within 80 yards of the ship. Lat. 66° 39′ 34′. From 9 to 12 p.m., pale aurora from E. to S.E.

12th - - At 2 a.m., a lane opening astern in line with a large berg E.N.E. of us. Lat. 66° 32′ 37″, long. 58° 29′. Six dovekies shot. At 4 p.m., lane closing. At 11 p.m., bright aurora from E. to S. and W.S.W., about 15° above horizon, with streamers towards zenith, numerous nebular spots of light at intervals in the air.

13th - - At 4 a.m., crack astern opening. Lat. 66° 26′ 9″, long. 58° 33′. A snow-bunting seen. At 8 p.m., crack closing. At 11 p.m., bright aurora from E. to W.S.W., about 18° above horizon, with streamers towards zenith; numerous nebular spots at intervals in the arch.

14th	A large flock of ducks flying Wd. Lat. 66° 23′ 3″, long. 58° 25′ 45″; no bottom at 170 fathoms, 31°, sp. g. 1·0290, at 4 fathoms 30°·5, sp. g. 1·0258. At 10 p.m., bright aurora in Ed. Midnight, faint arch of aurora to Sd., about 18° above horizon.
15th	A bear seen, also a flock of ducks. Lat. 66° 17′ 28″, long. 58′ 18″. Mean thickness of ice 3 feet 6 inches, decrease for month 1 foot 2½ inches. Mean thickness of snow 10½ in, increase for month 1 inch. Bear killed 7 miles from ship. At 11.30 p.m., faint aurora to Sd., appearing above a fog-bank. At midnight, auroral arch from E. to S.
16th	Lat. 65° 58′ 25″. At 3 p.m., ice cracked and opened around us. At 10 p.m., ice opening in every direction.
17th	At 2 a.m., ice opening everywhere, especially to S. and E. Lat. 65° 28′ 24″, long. 58° 48′. Midnight, ice closing.
18th	Drifting with floe-pieces. Many seabirds.
19th	Beset in loose ise. Three bears seen. At 8 p.m., much water to Ed.; floes and several bergs in sight; slight swell.
20th	At 4 a.m. considerable swell. Lat. 64° 21′ 48″, long. 59° 10′. A bear killed. Several small bergs in sight.
21st	Lat. 64° 10′ 13″, long. 59° 9′ 45″. Tried for soundings with 170 fathoms, at 110 fathoms 31°·2, sp. g. 1·0260; at 4 fathoms 29°·5. At midnight, several small bergs seen.
22nd	At 4 a.m., considerable movement in the ice. Lat. 63° 51′ 10″, long. 59° 19′ 30″, current S.W.
23rd	Lat. 63° 40′ 49″, long. 59° 25′. A black whale and several large seals seen.
24th	At 8 p.m., a high swell entering the pack and breaking it up.
25th	At 2 a.m. a high sea breaking up the ice. Lat. 63° 40′, long. 58° 50′. At 6 p.m., ice more open. At 8 p.m., no ice in sight except detached pieces. Seabirds abundant.
26th	At 4 a.m., no ice in sight. Lat. 63° 47′ 14″, long. 56° 36′.

No. XIV.

Results of Meteorological Observations made at Port Kennedy.

The steam yacht "Fox," Captain McClintock, R.N., wintered in 1858-9 at Port Kennedy, in latitude 72° 1′ N., longitude 94° 14′ W., a commodious harbour at the eastern entrance to Bellot's Strait, which is "the water communication between Prince Regent's Inlet and that part of the western sea now known as Franklin Channel. It separates the extreme northern part of the continent of North America, or Boothia Felix, from North Somerset. The shores of this strait are faced in many places with lofty granite cliffs, and some of the adjacent hills rise to 1,500 or 1,600 feet above the level of the sea. Through this channel the tide runs at the rate of six or seven knots an hour, and also frequent stormy winds blow from the west, which probably affect the local meteorology of the country immediately around the eastern entrance."*

Sir F. L. McClintock, in his narrative of the "Voyage of the 'Fox,'" says; "I have determined upon naming this beautiful little anchorage *Port Kennedy*, after my predecessor, the discoverer of Bellot Strait, of which it is decidedly *the* port;" and he states, "The appearance of Bellot Strait is precisely that of a Greenland fiord; it is about 20 miles long and scarcely a mile wide in the narrowest part, and there, within a quarter of a mile of the north shore, the depth was ascertained to be 400 feet." Its granitic shores are bold and lofty, with a very respectable sprinkling of vegetation for lat. 72°. Some of the hill-ranges rise to about 1,500 or 1,600 feet above the sea."

Sir Allen Young, who served as second lieutenant of the "Fox," in his account of the voyage published in the "Cornhill Magazine for 1860, January," calls Port Kennedy "a fine harbour surrounded by granite hills," and speaks of the winds drawing through Bellot Strait and down the harbour as through a funnel.

The meteorological register, which was under the charge of David Walker, M.D., surgeon and naturalist to the expedition, was kept for the most part every two hours; but only the four-hourly observations have been now discussed. The observations have been completely discussed by Charles A. Schott, assistant U.S. Coast Survey, and published in "Smithsonian Contributions to Knowledge," No. 146.

The observations on atmospheric pressure were recorded from aneroid 17701, and they have been corrected for the error assigned by Schott, namely −0·22 inch, which reduces the readings to accordance with the mercurial barometer at 32°, and at the sea level. "There appears," says Schott, "to be no change depending on the higher or lower readings, nor is there any variation due to change of temperature."

* "Smithsonian Contributions to Knowledge," No. 146.

From the same authority it appears that the temperature of the air during the period 1858 September to 1859 August, was taken from an alcohol thermometer No. 7 by Newman. The following low-range thermometers were also supplied to the "Fox," but do not appear to have been used while at Port Kennedy, namely, Newman 11, 16, Pastorelli 19 and 23. From simultaneous readings of these instruments, furnished by Sir F. L. McClintock, Schott has deduced a table of corrections for them, from which the following has been compiled for correcting the observations made with Newman's:—

CORRECTIONS to the SCALE READINGS of THERMOMETERS by NEWMAN, 1858–9.

Thermometer.	Correction for Scale Error.						
	At −50°.	At −40°.	At −30°.	At −20°.	At −10.	At 0.	At +20.
Spirit, coloured, 7	—	−1·8	−0·6	−0·3	−1·3	−1·4	−0·4
„ „ 11	−2·2	−1·5	−0·4	−0·4	0	0	+0·1
„ colourless 16	+0·4	0	−1·0	−1·0	−0·7	−0·8	+0·6

Nos. 7 and 11 were returned to the Meteorological Office broken, but No. 16 arrived safely, and was tested at the Kew Observatory in 1859, with the following results: At 32°, correction +0°·5; at 52°, +0·7; at 72°, +0·4. Means were not at that time available for verifying thermometers at such low readings. When the present work was undertaken, it was evidently of much importance to verify this instrument, which is preserved in the Meteorological Office, as carefully and as low in the range as possible. There is, however, considerable difficulty in testing thermometers with their scales attached and reaching below the bulbs, in the small apparatus used with freezing mercury. The Superintendent of the Kew Observatory, Mr. G. M. Whipple, B.Sc., undertook the experiment, being fully informed of the value of the instrument in a historical and scientific point of view, and therefore of the care necessary to avoid breakage. He accomplished the task successfully and furnished the following corrections: At −38°, +0·1; at 12°, +0·9; at 22, +1·1; at 32°, +0·5; at 52°, +0·6, at 72°, +0·1. Thus it will be seen that the Kew corrections support those given by Schott, and by implication confirm the accuracy of those given by him for Nos. 7 and 11, so that we may now place complete reliance on the accuracy of the temperatures observed on board the "Fox."

These thermometers by Newman appear to have been specially constructed, and are certainly very accurate instruments, notwithstanding their not being graduated on the stem; but they are firmly fixed and cannot slip upon their scales. They are mounted on slabs of ivory, framed in mahogany, and are about a foot long.

Dr. Walker supplied the following description of the ozonometer used at Port Kennedy: "The test papers used for measuring the amount of ozone in the atmosphere, were prepared by moistening filtering paper in a solution of iodide of potassium, 1 grain to 100 of water. One of these papers when dried was hoisted up to the mizen

masthead (truck) an elevation of 59 feet above the sea, and allowed to remain there for 12 hours, when it was replaced by another paper. In order to exclude the light, rain, snow, &c. from the paper, it was inclosed in a box 4 inches square, pierced with holes in its sides and bottom, so as to admit a free current of air. The paper was fastened to a piece of wood revolving on an axle in the box; the paper used measured 2½ inches by 2 inches. (The test of coloration is different from last winter.) The scale by which the amount of discoloration was determined was formed by saturating (and drying) filtering paper in diluted tincture of iodine of London Pharmacopœia. The highest number, 12, being 2 of spirit to 1 of tincture; No. 11, 4 of spirit to 1 of tincture; No. 10, 6 of spirit to 1 of tincture; and so on, so that No. 1 was 24 of spirit to 1 of tincture.

Winter 1857–8; scale of test 12, 11, 10, 9, 8, 7, 6, 5, &c.
„ 1858–9; „ 12, 11·5, 11, 10·5, 10, 9·5, 9, &c."

In a paper read to the British Meteorological Society, and published in their Report for 1860, Dr. Walker gives the following interesting results: "Two-hourly observations with the barometer were taken during the winter of 1858–9, at Port Kennedy, lat. 72° 1′ N., long. 94° 15′ W., and a set of hourly observations in January; these latter showed two maxima and two minima, the former at 9 a.m. and 5 p.m., the latter at 6 p.m. and 2 a.m.; the two maxima and two minima occurred within 12 hours, so that there was an equal period without any varying fluctuation. The nearest station at which registers had been taken by other observers was at Port Bowen, lat. 78° 49′ N., long. 88° 54′ W., on the opposite side of Prince Regent's Inlet; here observations taken by Captain Parry, showed two maxima at 4 a.m. and 5 p.m., and two minima at at 10 a.m. and 11 p.m. During the month of July, at Port Kennedy, the barometer showed only one maximum and one minimum in 24 hours, the former at 2 p.m., the latter at 3 a.m. The lowest register during our stay at this place was 28·670 inches, the highest 31·070 inches. The greatest monthly mean height was 30·191, in April 1859. From November to April the fluctuation was never more than 1¼ inch.

"Throughout the greater part of our stay at Port Kennedy, the temperature of the air was registered every two hours. The lowest degree of cold noticed was −49°·5 F., the lowest registered −48°. Although it has been generally found that the lowest degree of cold was noticed during a calm, yet we experienced a temperature of −47° during a gale of wind. The lowest mean monthly temperature was −36°·06 F., in February, the mean winter temperature (three months) being −34°·2; the highest mean monthly temperature was 40°·14, the maximum temperature being 55°; the annual mean temperature was 2°·29.*

"During the spring and summer of 1859, a long series of observations was made, comparing the temperature of the air in the shade with that shown by a thermometer exposed against a black surface in the sun's rays. The greatest difference between the register of one thermometer and the other was 58°, at noon, 28th of March, the air

* These figures are subject to correction for the errors of instruments.—R. S., 31/1/79.

being 6°, and the thermometer against black in sun's rays 52°, blue sky, no clouds. During the same spring and summer the black-bulb thermometer was constantly used. This thermometer was suspended on a line between two poles about four feet above the snow, so as to be quite free from any rays thrown upon it by reflexion, the bulb of the thermometer was enclosed in a tube, tightly corked so as to exclude any currents of air. The maximum temperature generally occurred between 11.45 p.m. and 12.45 a.m., dependent on the state of the sky at the time. The highest temperature registered was 101°·5 F. on the 20th of June, the temperature of the air in shade was 49°. The greatest difference between the two thermometers was 62° on the 19th of May, the air being 25°. These observations are of considerable importance as bearing upon the subject of the rapid summer vegetation in the arctic regions.

"On the 14th of September 1858, a thermometer was placed in a brass tube, sunk 26 inches in the soil; this thermometer was read off at intervals of a week or a fortnight during eleven months. It was found that the temperature gradually decreased during the winter, and attained its minimum of zero on the 16th of March. From this date the temperature rose until our departure from Port Kennedy, when the temperature of soil at this depth was 31°·8, the air being 38°. The previous statement as to the mean winter temperature will show the comparison between the temperature of the air and soil.

"More than half of the auroras noticed in Port Kennedy were in the direction of a space of water which remained open during the winter. I am inclined to think that these auroras were but a few feet elevated above the surface of the water or ice: two of these being distinctly seen between the land (two miles distant) and myself. These auroras may have been caused by the *freezing of the vapour arising from this water space.* The electroscope was found to be affected by the presence of the aurora, especially when passing through the zenith; the general direction of those passing through the zenith was from north to south (true). The needle of the declinometer was also several times influenced by the presence of aurora, the greatest deviation being 15°. Several very fine auroras were noticed on the home passage, between the entrance of Davis's Strait and the coast of Ireland; these generally exceeded in brightness those seen in the arctic regions, and seem most evidently connected with the presence of cirrus clouds."

"The mean monthly amount of ozone in air seemed to be influenced by the degree of cold and the mean force of the wind. As moisture is one of the ways in which ozone may be destroyed, perhaps to the absence of moisture, and not to the presence of cold, is this effect referable. From a comparison of the daily results, there seems to be more ozone present during the days in which the wind is north and west, than when south and east. The prevailing winds throughout the period of observation were northerly. At one time I was inclined to think that the presence of aurora had an increasing effect on the amount of ozone, but the data are too few definitely to say so. There did not seem to be much difference between the mean amount of ozone present in air of Baffin's Bay and that of Port Kennedy.

Table I. contains the results of four-hourly observations of the atmospheric pressure, from which it appears that the mean pressure of the whole period, nearly an entire year, is 29·932 inches; that the maximum occurs about 6 p.m., the minimum about 4 a.m. The monthly mean pressure was greatest in March and April, least in July and August.

Table II. gives results for the mean temperature of the air. February was the coldest month, mean −37°·3; July the warmest, mean +40°·1; the mean of the year 1°·7, and the range 77°·4.

Table III. exhibits the highest and lowest pressure in each month, with the accompanying temperature, wind, and weather. In April the atmospheric pressure reached the very exceptional amount of 31·05 inches, in July it was as low as 28·76; so that the extreme range of the barometer was 2·29 inches.

Table IV. exhibits the highest and lowest temperature in each month, with the accompanying pressure, wind, and weather. The absolute maximum temperature was 55° in July, the absolute minimum −49°·8 in January, so that the extreme range was 104°·8.

Schott has discussed the temperature of the winds at Port Kennedy, and concludes that the E. winds are the warmest, the N.W. the coldest, and that calms depress the temperature.

Table V. contains the sums of the wind components for each month, and for the whole 328 days, together with the resultant winds for the entire period, from which it appears that on the whole the diurnal range of wind, as regards direction, is scarcely appreciable, although it shows maxima about 4 a.m. and about 6 p.m., and minima about noon and about 4 p.m.; and as regards force, the maximum occurs about 9 p.m., the minimum about 9 a.m. The mean force of all the wind is about 2 of Beaufort's scale.

Table VI. comprises monthly summaries of the winds, from which it appears that the prevalent wind was N.W. in January, February, June, July, November, December; that calms predominated in March, though N.E. and N.W. winds were frequent; that in April, N.E. and E.N.E.; in May and August, W.; in September W. and N.W.; in October, N.W. and N.E. winds were the most frequent.

Table VII. comprises summaries of weather notations. The frequency of "blue sky" or "clear" was very uniform for the several months December to April. Very little fog was recorded. Mists are frequent in winter. Rain fell in June, July, and August. Snow was most frequent in October.

Table VIII. contains results of ozone estimations, and the notations of snowdrift, each referring to a period of four hours. Ozone appears to have reached a maximum in January and a minimum in July. The morning and afternoon estimates give practically the same mean values. Why it is so much more active in winter than

summer remains to be explained. Snowdrift was most frequent in October and disappeared in July.

The wind reached force 8 and upwards in September 2 times, in October 19, in November 25, in December 5, in January 8, in February 5, in March 8, in April 6, in May 9, in June 11, in July 2, in August 1.

The following quotations are from McClintock's "Voyage of the 'Fox'":—

"1858 September 22nd.—Last evening, at 8 o'clock, a very vivid flash of lightning was observed. Its appearance in these latitudes is very rare; only once have I seen it before—in September 1850."

"1858 December 12th.—Very cold weather; thermometer down to −41°, and the breeze comes to us loaded with mist from the open water, causing the air to feel colder than it otherwise would."

"1858 December 26th.—Upon four days only during the last 14 has the weather permitted us to walk. I allude to the wind as the obstacle to our exercise; for temperature, when the air is still, is no bar to any reasonable amount of it. Three or four coveys of ptarmigan have been seen, and of these I shot one brace. The cold increases: the thermometer has fallen to −47½°, although blowing a moderate gale at the time, and the atmosphere dense with mist."

"December proved to be an unusually cold month, its mean temperature being −33°; and it was rendered more than ordinarily dark and gloomy by continual mists from Bellot Strait. This open water adds seriously to the drawbacks of a spot already sufficiently cheerless, gameless, and 'wind-loved.'"

"1859 January 9th.—Another week of uniform temperature of −40°, and confinement to the ship by strong winds. The atmosphere is loaded with enveloping mists which impart a raw and surprisingly keen edge to the chilling blasts."

"1859 March.—The thermometer ranges between zero and −20°; it has once been up to +13°. When exposed to a noon-day sun against the ship's side it rises 50° higher. The earth-thermometer—placed 2 feet 2 inches beneath the surface—which gradually fell until the 10th of this month, has now begun to ascend; its minimum was +½°; much snow also lay over it, 6 feet deep at this season."

As regards the observations on the temperature of the earth, the following notice by Sir Joseph D. Hooker, M.D., F.R.S., from the "Proceedings of the Linnæan Society," 1861, will be found of much interest:—"The country about Port Kennedy would, at first sight, appear to be favourable to arctic vegetation in many ways. It is uncovered by snow from July 1st to October 1st. The soil is not unfavourable, and there are ravines, lakes, marshes, and sea-beach, offering both shelter and varied conditions for plants; but yet the flora seems to be considerably poorer than that of any of the surrounding islands;" and he subsequently adds:—"I append a *résumé* of the important observations made by Dr. Walker on the temperature of the air and earth, and the average covering of snow; and, to render them more complete I have

extracted and meaned the monthly temperatures of Boothia of from three to four years' observations, published in Sir John Ross's 'Voyage.' The observations of these officers correspond to a remarkable degree, the approximate mean annual temperature, according to Ross, being +2°·5, and by Walker (interpolating August as 28°) +1°·0. The high mean temperature of the soil at 2 feet 2 inches depth is very remarkable, and that of the surface of the earth below the snow, which depends much on the temperature of the subsoil, and is of great influence upon the vegetation, is still more remarkable."*

"*Resumé of Observations at Port Kennedy on the Temperature of the Soil, &c., by Dr. Walker.*—On the 14th September 1858, so soon as it appeared probable that we should winter at Port Kennedy, I sunk a brass tube 2 feet 2 inches vertically in the ground, and inserted a padded thermometer. The ground at the time of sinking the tube was frozen from 6 inches below the surface, and it was with great difficulty that I could get the tube sufficiently far down. The soil (surface) was similar to that strewn over land, but from below 6 inches it was of a yellowish mud. The thermometer used was one of very small bore, with a long stem finely graduated (it had been prepared for taking the temperature of trees).

"From the 18th to the 29th September no register was made, as the ship was not in port; also from the 10th to the 28th March 1859, as I was absent from the ship, travelling. The minimum temperature registered was +0°·5, on March 10th, 1859. The lowest may be assumed at zero on the 16th March.

"The register was continued until June 18th, when the water entered the tube, and the thermometer was frozen to the side, so that it could not be detached. Column 2 gives the register of the thermometer. Column 3 gives the depth of the overlying snow, which was always greater than the average quantity over the land. On the 17th January 1859, a tube was placed 1 foot 1 inch deep in a mixture of shingle and earth; in this a thermometer was placed. The position of the ground was such that scarcely any snow lay upon it, the constant strong winds removing it almost as soon as deposited.

"Column 4 gives the register of this thermometer.

"February 12th, 1859.—A tube was placed horizontally on the surface of the ground beneath the snow lying over the place where thermometer No. 1 was sunk, and the temperature as shown by this thermometer (column 5) was registered until all the snow disappeared. Column 6 gives the mean temperature of the air for the day on which the registers of the different thermometers were taken.

"Column 7 gives the mean temperature of the air for the number of days or hours intervening between the registering of the thermometers.

"All the registers of the different thermometers are corrected so as to reduce them to that of the standard.

* See page 240.

Date.	Thermometer buried 2 ft. 2 ins.	Depth of Snow.	Thermometer buried 1 ft. 1 in.	Temperature of Surface below Snow.	Mean of Air on Days of Observation.	Mean of Air from that of Intervals.	Ross.
1858.		ft. in.					
September - -	+30°·9	—	—	—	+25°·0	+24°·5	+25°
October - -	24·4	0 6	—	—	− 9·6	− 8·4	− 9
November - -	15·8	4 0	—	—	12·0	13·6	9
December - -	12·0	4 5	—	—	34·9	33·7	16
1859.							
January - -	6·2	5 8	−21·5	—	34·0	33·4	26
February - -	2·3	5 8	24·8	− 3·0	32·7	34·8	32
March - -	0·7	6 0	16·7	− 3·8	19·9	17·4	27
April - - -	1·6	6 6	− 8·1	+ 0·7	− 1·6	5·4	3
May - - -	3·5	6 0	+ 8·1	4·9	+16·4	+14·4	+13
June - - -	7·5	3 6	27·3	+26·0	34·2	35·0	34
July - - -	31·7	0 0	+39·0	—	40·7	39·9	36
August - -	?+40·0	?0 0	?	—	?+30·0	+28·0	+25
Mean - - -	+14·7	—	—	—	+ 1·8	+ 1·0	+2·5

Finally, the following note in addition to that given on page 240 relating to auroræ, by Dr. Walker, may be quoted: "Of the 42 auroræ observed during our winter at Port Kennedy (1858–9), 24 were in a direction of a space of water, open throughout the winter, or of the vapour rising from it. More than this number might be traced to it, but of these 24 I am certain. On the nights of the 30th and 31st March 1859, I noticed the aurora between myself and the land, the patches of light could plainly be seen a few feet above the small mass of vapour arising from the water. The opposite land was from two and a half to three miles distant, and I am confident if this land had been sufficiently high, the most of these 24 auroræ would have been seen suspended but a short distance above the surface of the water or ice. On five occasions the aurora was observed to cause agitation of the magnetic needle; on one of these, December 24, 1858, I noticed a vibration of 15°; on the other four times the vibration was not much more than a degree; four of these five occurred when the aurora was from south to north, passing through the zenith. A fine wire was attached to the fore yard-arm by insulated supports, and led to a snow-house with a connexion through the floe to the water beneath. Here the gold-leaf electroscope was at times applied, and I was enabled to observe the presence of the electricity in the atmosphere and also the influence of the aurora on the instrument. There appeared to occur two periods of minimum electric intensity about 9 p.m. and noon; the instrument not being sufficiently delicate I could not be satisfied about the time of the maximum. On the whole there seemed to be more fur electricity present in the air at Port Kennedy than Baffin's Bay or Davis' Strait. On six occasions in 1857–8 I observed a well-marked effect on the electroscope by the presence of aurora, the gold-leaves diverging with greater force and remaining so for a longer time than usual. On three occasions at Port Kennedy, when the aurora was from horizon to zenith, the electroscope was strongly effected; on all these occasions the electricity was positive."—Quoted in "Smithsonian Contributions," No. 146.

Table I.

Mean Pressure of the Atmosphere, at Port Kennedy, 1858 September, to 1859 August.*

Hours.	1858.				1859.								
	Sept. (16 days).	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug. (8 days.)	Year.
	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.
4 a.m. - -	29·984	29·747	30·008	29·833	29·942	29·900	30·115	30·154	29·963	29·896	29·665	29·650	29·905
8 „ - -	·998	·787	·043	·873	·963	·928	·160	·181	·983	·902	·692	·660	·931
Noon - -	30·007	·809	·046	·865	·974	·926	·166	·166	30·009	·907	·713	·665	·938
4 p.m. - -	·005	·811	·061	·885	·983	·932	·177	·176	·013	·911	·721	·665	·945
8 „ - -	·016	·811	·063	·874	·988	·935	·186	·183	·026	·910	·704	·654	·946
Midnight -	·000	·790	·045	·859	·980	·920	·176	·162	·015	·894	·672	·618	·928
Mean - -	30·002	29·793	30·044	29·865	29·972	29·924	30·163	30·170	30·001	29·903	29·695	29·652	29·932

Table II.

Mean Temperature of the Air, at Port Kennedy, 1858 September, to 1859 August.*

Hours.	1858.				1859.								
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Year.
4 p.m. - -	+23°·7	+6°·5	−12°·1	−33°·2	−35°·4	−37°·7	−21°·6	−5°·5	+12°·4	+32°·8	+37°·5	+36°·1	+0°·3
8 „ - -	24·5	6·5	11·1	34·4	35·1	37·2	19·8	3·4	16·1	37·7	41·1	37·8	1·9
Noon - -	27·1	8·1	11·1	33·9	34·4	36·5	12·8	+0·2	18·2	39·8	43·5	39·1	3·9
4 p.m. - -	27·3	6·4	11·6	34·2	34·3	37·1	14·5	−0·4	17·6	36·9	42·0	39·9	3·2
8 „ - -	25·8	6·0	12·3	34·4	34·0	37·3	19·7	5·1	13·5	33·9	40·0	39·0	1·3
Midnight -	+25·5	+5·8	−13·0	−34·3	−34·9	−37·9	−21·4	−6·8	+10·5	+30·8	+36·7	+36·4	+0·2
Mean - -	+25·7	+6·6	−11·9	−34·1	−34·7	−37·3	−18·3	−3·5	+14·7	+35·3	+40·1	+38·0	−1·7

Table III.

Extremes of Atmospheric Pressure, with accompanying Temperature, Wind, and Weather, at Port Kennedy.

Month.	Max.	Date.	Temp.	Wind.	Weather.	Min.	Date.	Temp.	Wind.	Weather.	Range.
	inches.	d. h.				inches.	d. h.				
October 1858 -	30·48	7 0	+13°·5	W. 2	b c	29·16	19 16	+ 5°·0	N.W. 4	s	1°·32
November „ -	·46	10 0	−17·6	N.W. 2	b m	·43	28 16	−16·7	N.E. 9	m	1·03
December „ -	·55	28 4	30·6	W. 4	„	·23	20 16	14·9	N.W. 4	m s	1·32
January 1859 -	·34	31 0	40·6	N.E. 1	b	·51	1 16	45·0	„ 3	m	0·83
February „ -	·37	23 8	40·6	W. 1	b m	·23	12 12	25·4	W.N.W. 4	b	1·14
March „ -	·60	21 8	29·6	N.E. 1	b	·54	10 16	−26·5	„ 7	„	1·06
April „ -	31·05	12 8	−18·5	N.N.W. 2	„	·65	3 16	+ 3·8	E.N.E. 3	c m s	1·40
May „ -	30·50	31 0	+24·0	„ 4	o s m	·54	16 16	15·0	N.W. 4	b	0·96
June „ -	·48	1 0	27·0	N.W. 6	o m s	·43	18 0	39·5	Calm	c r	1·05
July „ -	·31	22 8	+45·0	Calm	b	28·76	10 4	+35·5	N.N.W. 7	o c q r	1·55
Absolute -	31·05	April	—	—	—	28·76	July	—	—	—	2·29

* September: observations from 1st to 5th, 11th to 17th, 27th to 30th, or 16 days. August: observations from 1st to 8th inclusive, or 8 days.

Table IV.

Extremes of Temperature, with accompanying Pressure, Wind, and Weather, at Port Kennedy.

Month.	Max.	Date.		Bar.	Wind.	Weather.	Min.	Date.		Bar.	Wind.	Weather.	Range.
	°	d.	h.	inches.			°	d.	h.	inches.			°
October 1858 -	+28·5	1	0	29·64	N.E. 5	o s	−21·5	25	20	30·10	N.N.W. 9	b m	50·0
November „ -	+12·2	19	0	·96	E.N.E. 2	c m	36·1	24	12	·42	Calm	b c	48·0
December „ -	−14·9	20	16	·23	N.W. 4	m s	49·0	25	12	29·88	W. 7	b m	34·1
January 1859 -	14·9	14	0	·92	„ 5	m	49·8	20	16	·76	V'ble. 1	b	34·9
February „ -	−14·9	3	16	·38	Calm	m s	48·8	17	4	30·08	W. 2	b c	33·9
March - „ -	+10·2	24	0	30·22	W. 1	b c	33·9	17	12	·10	„ 2	b c m	44·1
April - „ -	22·3	18	4	29·89	N.E. 7	o s	27·5	11	12	·89	Calm	b	49·8
May - „ -	34·5	28	0	30·16	Calm	„	− 2·0	6	12	·04	W.N.W. 4	„	36·5
June - „ -	50·5	17	0	29·76	„	b c	+18·5	1	16	·30	N.W. 9	b c m	32·0
July - „ -	+55·0	29	0	·93	W.S.W. 2	„	+30·0	9	16	28·98	W.b.N. 6	c	25·0
Absolute -	+55·0	July		—	—	—	−49·8	Jan.		—	—	—	104·8

Table V.

Sums of Wind Components, at Port Kennedy, 1858 September, to 1859 August.

Hours.	September (16 days) 1858.				October 1858.				November 1858.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
4 a.m. -	28·7	11·1	7·3	27·8	84·8	10·7	33·3	57·9	85·1	—	29·6	59·0
8 „ -	26·6	12·5	15·1	29·4	77·4	17·5	37·7	57·5	75·6	—	21·5	57·2
Noon -	19·1	17·7	14·1	28·8	71·3	9·0	42·4	51·9	77·4	—	31·5	49·7
4 p.m. -	21·4	12·9	24·2	25·9	86·9	8·0	45·4	45·4	77·7	—	34·6	51·6
8 „ -	30·5	8·2	18·6	31·2	83·3	7·2	42·1	50·1	77·9	—	35·8	52·5
Midnight -	33·1	10·7	14·8	27·0	80·6	6·5	40·9	54·8	70·8	—	27·7	43·9
Means -	26·6	12·2	15·7	28·4	80·7	9·8	40·3	52·9	77·4	—	30·1	52·3

(*continued*).

Hours.	December 1858.				January 1859.				February 1859.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
4 a.m. -	66·0	0·7	14·9	68·5	64·6	1·1	6·5	61·2	44·5	—	5·8	72·9
8 „ -	65·1	3·6	15·7	64·2	70·8	—	7·1	56·4	41·6	—	5·8	63·7
Noon -	51·7	6·9	15·3	61·1	77·6	—	8·3	54·6	39·8	—	6·6	66·9
4 p.m. -	52·9	5·2	16·4	65·8	76·1	—	11·3	69·9	44·2	0·7	5·8	66·7
8 „ -	62·8	4·6	11·3	59·5	65·2	—	7·5	61·6	46·0	—	8·7	58·6
Midnight -	55·6	2·0	12·5	65·5	78·9	—	13·6	62·2	51·4	—	12·0	65·2
Means -	59·0	3·8	14·3	64·0	72·2	0·2	9·1	61·0	44·6	0·1	7·5	65·7

Table V. (*concluded*).

Sums of Wind Components, at Port Kennedy, 1858 September to 1859 August—*cont.*

Hours.	March 1859.				April 1859.				May 1859.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
4 a.m. -	41·6	1·4	22·1	37·8	39·1	0·4	45·6	22·3	35·0	—	15·8	56·9
8 „ -	41·2	0·7	25·1	33·0	39·5	3·4	47·9	16·1	27·5	—	12·0	41·9
Noon -	45·4	0·7	22·8	32·5	53·3	3·5	47·7	27·7	49·6	—	9·6	71·0
4 p.m. -	46·8	0·7	20·9	30·6	55·6	0·8	39·1	24·6	40·3	—	7·4	68·4
8 „ -	44·0	0·7	14·1	34·8	57·5	—	37·2	23·3	41·5	—	5·9	65·0
Midnight -	34·9	1·4	23·2	29·3	59·0	—	40·8	23·8	39·4	—	5·1	69·9
Means -	42·3	0·9	21·4	33·0	50·7	1·4	43·1	23·0	38·9	—	9·3	62·2

(*continued.*)

Hours.	June 1859.				July 1859.				August (8 days) 1859.			
	N.	S.	E.	W.	N.	S.	E.	W.	N.	S.	E.	W.
4 a.m. -	60·3	—	21·2	55·5	59·1	6·9	23·7	56·3	5·7	—	8·7	9·0
8 „ -	62·5	0·7	23·6	60·1	58·7	6·9	23·9	58·7	12·1	—	10·5	10·8
Noon -	64·0	—	21·5	50·7	57·7	5·9	26·2	58·0	12·7	2·1	11·0	14·8
4 p.m. -	63·9	0·9	10·7	60·7	51·7	5·6	19·2	58·8	13·9	0·7	12·9	13·6
8 „ -	63·1	1·6	16·7	54·7	55·1	3·0	17·4	53·7	12·6	—	9·1	10·7
Midnight -	75·5	—	14·1	49·3	52·6	7·7	24·7	51·2	7·7	—	7·0	12·2
Means -	64·9	0·5	18·0	55·2	55·8	6·0	22·5	56·1	10·8	0·5	9·9	11·9

Hours.	In 328 days.				Resultants.
	N.	S.	E.	W.	°
4 a,m. -	614·5	32·3	234·5	585·1	N. 31 W. 2·07
8 „ -	598·6	45·3	245·9	549·0	N. 29 W. 1·92
Noon -	619·6	45·8	257·0	567·7	N. 28 W. 1·98
4 p.m. -	631·4	35·5	247·9	582·0	N. 29 W. 2·07
8 „ -	639·5	25·3	224·4	555·9	N. 29 W. 2·13
Midnight -	639·5	28·3	236·4	554·3	N. 28 W. 2·10
Means -	623·9	35·4	241·0	565·7	N. 29 W. 2·04

Table VI.

Summary of the Winds, referred to Sixteen Points, with Mean Force (Scale 0 to 12), at Port Kennedy, 1858 September, to 1859 August.

Months.	N.		N.N.E.		N.E.		E.N.E.		E.		E.S.E.		S.E.		S.S.E.		S.	
	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.
1858.																		
September	9	3·9	6	4·0	16	4·0	—	—	3	3·3	3	4·7	4	5·0	4	4·8	3	3·3
October	2	4·0	9	4·8	43	4·7	15	4·1	2	3·0	1	5·0	4	3·0	8	1·9	4	4·5
November	1	2·0	1	7·0	29	5·5	24	2·8	1	2·0	—	—	—	—	—	—	—	—
December	—	—	—	—	16	3·1	19	3·1	—	—	—	—	1	3·0	—	—	1	2·0
1859.																		
January	10	4·0	2	4·5	23	2·6	4	2·5	—	—	—	—	—	—	—	—	—	—
February	—	—	—	—	15	3·5	7	1·1	—	—	—	—	1	1·0	—	—	—	—
March	—	—	—	—	53	2·8	11	2·5	—	—	—	—	5	1·2	—	—	—	—
April	12	2·6	11	2·8	41	3·8	35	3·7	3	2·7	4	2·2	—	—	—	—	—	—
May	11	2·1	13	2·4	9	3·6	13	1·8	—	—	—	—	—	—	—	—	—	—
June	8	2·4	4	4·5	32	2·8	17	2·5	3	1·7	—	—	1	1·0	—	—	—	—
July	1	3·0	4	5·5	28	4·5	16	1·8	5	2·0	1	5·0	1	1·0	1	1·0	1	1·0
August	—	—	—	—	12	5·0	4	2·8	2	2·5	—	—	—	—	—	—	—	—

(*continued.*)

Months.	S.S.W.		S.W.		W.S.W.		W.		W.N.W.		N.W.		N.N.W.		Variables.		Calms.	Total Observations.
	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.	O.	F.		
1858.																		
September	1	3·0	7	3·1	4	4·8	16	5·1	6	5·2	1	2·0	10	4·8	—	—	3	96
October	1	3·0	6	3·3	—	—	6	2·5	17	5·5	49	5·1	11	5·7	—	—	8	186
November	—	—	—	—	—	—	4	4·5	4	6·5	83	4·3	14	4·6	—	—	19	180
December	—	—	5	2·0	4	5·2	13	5·5	2	4·5	90	4·3	4	3·8	3	1·0	28	186
1859.																		
January	—	—	—	—	1	3·0	4	4·2	10	4·0	108	4·1	1	4·0	3	1·0	20	186
February	—	—	—	—	—	—	33	3·8	16	4·5	73	3·9	—	—	—	—	23	168
March	—	—	1	2·0	—	—	10	3·1	6	7·2	43	4·0	—	—	—	—	57	186
April	—	—	—	—	2	6·0	19	3·7	—	—	11	4·5	13	4·1	1	1·0	28	180
May	—	—	—	—	—	—	51	4·7	12	3·4	23	4·2	22	3·2	—	—	32	186
June	1	1·0	—	—	1	8·0	11	4·2	5	4·0	64	5·3	8	3·8	—	—	25	180
July	4	3·5	4	1·2	11	4·1	5	4·0	28	4·1	51	4·1	4	5·8	—	—	21	186
August	—	—	3	1·3	—	—	13	3·2	2	6·0	7	3·3	—	—	—	—	5	48

Table VII.

Summary of Weather Notations, at Port Kennedy, 1858 September, to 1859 August.

Hours.	September 1858.								October 1858.								November 1858.							
	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.	b.	c.	o.	m.	f.	r.	s.	q.
4 a.m.	3	9	4	1	—	—	2	—	9	5	17	9	—	—	10	—	8	11	11	24	—	—	5	—
8 „	3	9	4	—	—	—	4	—	8	9	14	7	1	—	6	—	6	10	14	22	—	—	4	—
Noon	4	10	2	1	—	—	1	—	10	6	15	8	1	—	9	—	6	13	11	21	—	—	5	—
4 p.m.	4	8	4	—	—	—	1	—	10	4	17	7	1	—	10	—	7	12	11	18	—	—	3	—
8 „	3	8	5	1	—	—	4	—	10	6	15	7	—	—	13	1	9	13	8	20	—	—	5	—
Midt.	5	7	4	—	—	—	3	—	11	5	15	6	—	—	9	1	10	11	9	22	—	—	4	—
Means	4	8	4	—	—	—	—	—	10	6	15	—	—	—	—	—	8	11	11	—	—	—	—	—

—	December 1858.								January 1859.								February 1859.							
4 a.m.	15	12	4	10	—	—	2	1	16	11	4	18	—	—	1	—	14	6	8	18	—	—	1	3
8 „	15	10	6	13	—	—	2	—	16	11	4	19	—	—	1	—	12	10	6	21	—	—	2	2
Noon	12	11	8	19	—	—	—	—	13	12	6	20	—	—	3	—	13	10	5	15	—	—	3	3
4 p.m.	14	13	4	18	—	—	—	—	13	12	6	20	—	—	2	—	11	9	8	18	—	—	1	1
8 „	15	14	2	18	—	—	2	1	13	12	6	21	—	—	3	—	15	10	3	16	—	—	2	1
Midt.	16	10	5	19	—	—	3	1	17	11	3	17	—	—	1	—	19	7	2	15	—	—	1	3
Means	14	12	5	—	—	—	—	—	15	11	5	—	—	—	—	—	14	9	5	—	—	—	—	—

—	March 1859.								April 1859.								May 1859.							
4 a.m.	16	7	8	11	—	—	8	2	11	6	13	3	—	—	4	1	10	2	19	4	—	—	9	—
8 „	15	9	7	10	—	—	5	2	15	5	10	1	—	—	4	—	10	2	19	6	—	—	8	1
Noon	15	7	9	12	—	—	4	2	15	7	8	—	—	—	5	1	12	6	13	5	—	—	7	2
4 p.m.	16	11	4	10	—	—	4	1	16	8	6	—	—	—	3	—	9	7	15	1	—	—	8	4
8 „	14	10	7	14	1	—	5	1	14	6	10	2	—	—	8	1	14	6	11	1	—	—	5	3
Midt.	17	7	7	14	—	—	6	2	14	3	13	4	—	—	6	1	13	4	14	1	—	—	7	3
Means	15	9	7	—	—	—	—	—	14	6	10	—	—	—	—	—	11	5	15	—	—	—	—	—

—	June 1859.								July 1859.								August 1859.							
4 a.m.	11	9	10	2	—	—	2	—	11	12	8	3	—	4	1	1	1	2	5	1	—	1	—	—
8 „	12	6	12	3	—	1	1	—	12	9	10	2	—	1	—	—	2	3	3	1	—	2	—	—
Noon	12	8	10	2	—	1	3	—	13	12	6	2	—	1	1	1	1	1	6	1	—	1	—	—
4 p.m.	14	7	9	2	1	3	2	—	15	9	7	1	—	2	—	1	1	2	5	1	—	1	—	—
8 „	12	8	10	4	1	2	—	2	13	11	7	1	—	5	—	1	2	2	4	1	—	1	—	—
Midt.	11	11	8	3	1	2	1	2	12	11	8	3	—	6	1	1	3	2	3	1	—	1	—	—
Means	12	8	10	—	—	—	—	—	13	10	8	—	—	—	—	—	2	2	4	—	—	—	—	—

Table VIII.

Means of Ozone Observations, Sums of Snowdrift Notations, and Thickness of Ice, Port Kennedy, 1858 October 16th, to 1859 July 21st.

Months.	Ozone.			Snowdrift.	Thickness of Ice formed since October 3rd.	
	9 a.m.	9 p.m.	Days.			ft. ins.
October 1858 -	9·4	9·7	16	39	15th	0 9¾
November " -	10·5	10·6	30	52	16th	1 9½
December " -	10·7	10·8	31	53	18th	3 1
January 1859 -	11·0	10·9	31	50	—	—
February " -	10·8	10·8	28	57	—	—
March " -	9·7	9·6	31	32	—	—
April " -	9·7	10·1	30	52	11th	6 2
May " -	8·6	8·7	31	37	11th	5 4
June " -	8·4	8·7	30	9	13th	4 6
July " -	7·7	8·2	21	—	—	—

Remarks from the Log of the "Fox."

1858.—SEPTEMBER.

27th, Noon - In Bellot Strait, sounded in middle, 75 fathoms, rock and sand; at 65 fathoms, 31° sp. g. 1·025; at surface, 27°·8, sp. g. 1·026.
Temperature of the sea was 29° from 34 observations.
Deer were seen on 1st, 5th, 29th; three were killed, the largest weighed 354 lbs.

OCTOBER.

3rd, 10.30 p.m. - Faint lightning, temperature 23°, barometer 29·58, N.E. 8, q s.
14th, 2 p.m. - Prismatic halo, with two parhelia to right and left of Sun.
20th - - 2 a.m., sudden shift of wind to N.W. 10 p.m., halo round Moon, diameter about 45°.
22nd, 10 p.m. - Prismatic halo round Moon, diameter about 45°.
28th, 10 p.m. - Bands of aurora from S. to W. about 20° above horizon.
29th, 8 p.m. - Throughout first watch, narrow bands of aurora S.S.E. to W.N.W., about 25° above the horizon, the extremities joined by a narrow band stretching across the zenith.
30th, 10 p.m. - Faint aurora in S.W.
31st, 10 p.m. - Aurora in N.W.
Deer were frequently seen. Many seals were seen in Bellot's Strait on 20th. One deer, a few ptarmigan, two hares were shot, an ermine was caught, and a blue fox was seen.

NOVEMBER.

6th, 10 p.m. - Faint aurora S.b.E. to W.S.W.
7th, 10 p.m. - Slight aurora in S.W.
8th - - 10 a.m., parhelia on each side of Sun about 23° distant. 10 p.m., faint aurora in S.W.
9th, 10 p.m. - Faint aurora from S. to W., about 10° above horizon.
12th, 10 p.m. - Pale streak of aurora, northern horizon to zenith.
14th, 10 p.m. - Faint aurora from W.N.W. to S.W.
23rd, 10 p.m. - A halo round Moon about 45° diameter.
A few ptarmigan and three deer were seen.

DECEMBER.

3rd, 10 p.m. - Pale aurora in S.W. about 18° above horizon.
4th, Midnight - Bright aurora from E. to S. and W.N.W., about 25° above horizon.
5th - - 6 to 7.30 p.m., flashing aurora from S.E. to N.W. across zenith. 10 p.m., faint aurora in Wd. Midt., aurora in W.N.W. and N.W. across zenith to S.E.
6th, 8 to 9 p.m. - Pale aurora W. to S.E.
8th, 10 p.m. - Faint aurora in S.E. about 40° above horizon.
12th, 5 to 6 a.m. - Bright aurora from N.W. to S.E. through S., about 60° above the horizon.
13th - - 6 to 7 a.m., bright aurora from S.E. to N. 9 p.m., bright aurora from S.E. to S.S.W. and W.N.W., about 20° above the horizon. Midt. to 4 a.m., extending from S.W. to N.W., disappeared at 5.30 a.m.
14th, 10 p.m. - Aurora from E.S.E. to N.W. through S., 20° above horizon.
15th, 5 to 8 a.m. - Bright aurora from E. to N.W. through S., about 30° above horizon.
18th, 4 p.m. - Halo round the Moon, about 45° in diameter.
20th, 10 p.m. - Halo round Moon, diameter about 45°.
23rd, 10 p.m. - Halo round Moon, diameter about 45°.
24th, 11 p.m. - Very bright aurora, all over the heavens, causing the magnetometer to oscillate considerably.
28th, 11 p.m. - Aurora S.S.E. to W.b.N., about 20° above the horizon.
30th, 5 p.m. - Aurora in S. about 35° above horizon.
Ptarmigan were frequently seen, three white foxes were caught and a hare shot.

1859.—JANUARY.

1st, 10 p.m. - Aurora from S. to W., about 40° above horizon.
2nd, 10 p.m. - Faint aurora in S.W.
3rd, 5 p.m. - Faint aurora in Ed. from horizon to zenith.
3rd, 8 to 12 p.m. - Faint aurora in S.Ed.
8th, 11 p.m. - Faint aurora from S.E. to W.S.W., just above the horizon.
9th - - 6 to 7 a.m., bright aurora from W. to N.W. 10 p.m., narrow bands of aurora from S. to W. through the zenith.
10th - - 5 to 7 a.m., slight aurora from S.E. to S. and N.W. 8 to 12 p.m., strong auroral bands from S. to N. though the zenith.
11th, 9 to 12 p.m. - Aurora from S.E. to W., about 15° above the horizon.
14th, 10 p.m. - Halo round Moon, 45° diameter.
17th, 10 p.m. - Lunar halo.
19th, 6 p.m. - Lunar halo.
26th - - Sun appeared 11.10 a.m.
31st - - 3 a.m., bright aurora S.E.b.S. to N.W. 6 to 8 p.m., from W. to S.E. bands of aurora from horizon to zenith; electrometer slightly affected.
A few ptarmigan and a raven were seen. A fox was caught and a hare shot.

FEBRUARY.

1st, 3 a.m. - Aurora from S.E. and S. to N.W.
5th - - One seal seen, also one dovekie in winter plumage.
8th, 10 p.m. - Aurora in S.Wd.
9th, 4 a.m. - Aurora S.E., S. to N.W.
19th, 11 p.m. - Aurora from S. to N. through the zenith.
20th, 11 p.m. - Faint aurora from S. to zenith.
21st, Noon - In Sun's rays against ship's side $-0^{\circ}\cdot5$.
23rd - - 2 a.m., a very bright aurora from N.E. to S.W. At 4 a.m, slight aurora in E.
26th, 11 to 12 p.m. - Aurora from N to S. through zenith.

Two reindeer were seen on 3rd and two on the 12th, and a white hare on the 26th. A sooty fox and five white foxes were caught and 28 ptarmigan shot.

MARCH.

5th, 4 p.m. - Frost smoke seen in Prince Regent's Inlet.
6th, 9 p.m. - A narrow band of aurora from N.N.W. to S.S.E., through zenith; a well-marked divergence of leaves of electrometer.
15th, 4 a.m. - Lunar halo.
23rd, 8 p.m. - Bellot Strait entirely free from vapour.
30th, Noon - Parhelia on each side of Sun. Midnight, aurora seen between observer and land to W. and S.W.
31st, Midnight - Aurora westward, seen between observer and land.

Twenty-nine ptarmigan and three hares were shot, four white foxes and a lemming were caught, three bears and one reindeer were seen.

APRIL.

8th, Noon - Bellot Strait entirely free from vapour.
9th, Noon - A second space of water in Bellot Strait, more to west and smaller than the first.
21st, 6 p.m. - Prismatic parhelia and a part of halo on each side of Sun, distant about 22° 30′.
23rd, 6 p.m. - Cirro-stratus moving from S.E. ; wind N.E., force 8.
26th, 8 p.m. - Cumulus from S.S.W. ; wind N.E., 3.

Two ptarmigan were shot and a fox was caught; nine hares, a raven, a bear and two cubs were seen.

MAY.

1st, 6 p.m. - Parhelia and part of halo on each side of Sun, distant about 23°.
5th, 6 p.m. - Parhelia and part of halo on each side of Sun.
6th, 7 p.m. - Prismatic parhelia and part of halo on each side of Sun, 22° 20′ distant.
12th, Noon - Three small pools of water noticed in strait between Fox Island and southern shore.
21st, 4 p.m. - A long lane of water seen to E.N.E. in Regent's Inlet.
22nd, 8 a.m. - Ice loosened from ship's sides, allowiug ship to rise.

Hares were frequently seen, snow-buntings on several days, and deer at the end of the month. On 3rd, two ravens were seen. On 29th, three burgomasters were seen. A bear was shot, also a finch. Two wolves, a fox, and three seals were seen.

JUNE.

3rd, 8 p.m. - Black bulb thermometer, max. 93° in Sun's rays.
5th, 4 p.m. - Some pools of water in Bellot Strait ; also pools to N.E. and E.N.E. in Regent's Inlet.
13th - - First plant seen in flower (*Loiseleuria procumbens*).

15th, Noon - Black bulb thermometer, max. in Sun's rays $96^{\circ}\cdot5$.

Geese were seen on 4th and 13th; the first ducks on the 7th ; a red-throated diver on the 23rd, a plover on 27th. Buntings were seen on several days, a raven on the 3rd, and another on the 7th. Gulls were first seen on 3rd, and frequently afterwards. The following were shot; one king-duck, four long-tailed ducks, 36 ducks, two geese, five sand-pipers, two red-throated divers, two plovers, two seals, two deer, one bear, two foxes.

JULY.

12th - - Several lanes of water in Regent's Inlet.
26th - - Bellot Strait entirely free from fast ice as far as the western heads.
28th, Midnight - Ship drifting out of Port Kennedy with a large extent of harbour ice.
29th, 8 a.m. - Returned to Port Kennedy.
30th, 4 a.m. - Outer harbour clear of ice.

On 20th, some small trout were caught; on 24th, an usuk (*Phoca barbata*) was seen ; on 25th, several flocks of ducks were flying eastward. Three hares, two ermines, and a fox were seen. The following were shot : 26 gulls, 13 ducks, one diver, eight seals, one lemming, one hare.

AUGUST.

3rd, 4.30 - Thunder ! ! Wind N.E. 2, temp. 35°, bar. 29·62, o r.
4th, Noon - Bellot Strait and Port Kennedy clear of ice.
7th - - Harbour almost full of ice.

A deer, four seals, two gulls, 15 ducks were shot.

LIST OF PUBLICATIONS, &c.

Issued under the Authority of the Meteorological Council.

OFFICIAL.

No. 1. Report for 1867. Presented to Parliament. Price 1*s.*

2. Instructions for Meteorological Telegraphy. New Edit. (1875.) Price 6*d.*

3. Fishery Barometer Manual. Price 6*d.*

4. Charts of Surface Temperature, South Atlantic Ocean. Price 2*s.* 6*d.*

5. Report for 1868. Presented to Parliament. Price 5*d.*

6. Report for 1869. Presented to Parliament. Price 10*d.*

7. Quarterly Weather Report for 1869.—Parts I. to IV. Price 5*s.* each.

8. Barometer Manual. (New Edition in the Press.)

9. Quarterly Weather Report for 1870.—Parts I. to IV. Price 5*s.* each.

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