XXIV. *On Hourly Observations of the Magnetic Declination made by Captain* ROCHFORT MAGUIRE, *R.N., and the Officers of H.M.S. 'Plover,' in* 1852, 1853 *and* 1854, *at Point Barrow, on the shores of the Polar Sea. By Major-General* EDWARD SABINE, *R.A., D.C.L., Treas. and Vice-President.*

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AMONGST the measures adopted for the relief of Sir JOHN FRANKLIN'S expedition, H.M.S. 'Plover,' commanded by Captain T. E. L. MOORE, R.N., was despatched from England in 1848, and stationed until 1852 in Behring Strait, having on board supplies of provision for the 'Erebus' and 'Terror,' in the event of their succeeding in effecting a passage, or for their crews in case they should be obliged to abandon the ships and should attempt a retreat by the western route. The 'Plover' was annually communicated with and provisioned afresh by one of the vessels of the Pacific squadron. In 1852 Captain MOORE was succeeded in the command of the 'Plover' by Captain ROCHFORT MAGUIRE, R.N., and several other changes in the officers and seamen were made. It was also directed that the 'Plover' should take up a more advanced position than she had occupied in the preceding years. She was accordingly moved in September 1852 to a small harbour adjoining Point Barrow, the most northerly point of the American Continent between Behring Strait and Mackenzie River, in lat. 71° 21′ N., long. 156° 15′ W., where she was made secure for the winter by the middle of October, and where she remained until the summer of 1854. A more uninviting and apparently uninteresting situation for a two years' residence cannot well be imagined. It is thus described by Mr. THOMAS A. HULL, the second master, in a letter which I received from him at the end of the first year, dated August 1853:—"Point Barrow might well be called the World's End; the coast for more than 100 miles both east and west of it has not a rise above 40 feet, and the Spit of Point Barrow is but 15 feet above the sea in the highest part, and in most places it is not above 5. The islands to the eastward are still lower, some of them being overflowed by a rise of 3 feet occasioned by a gale in December." Point Barrow seems, however, to have been admirably chosen for the objects for which the 'Plover' was employed. It would have been scarcely possible for boats or parties of men retreating along the coast from the eastward, to have passed without being seen; whilst by a judicious treatment of the native Esquimaux, a friendly communication was throughout maintained with them, and their good offices, in case they had been needed, secured along a considerable extent of coast. In this most dreary situation, in which the monotony of existence during the long period of a year and three quarters had but one relief,—that of an excursion to Port Clarence in Behring Strait, in the summer of 1853, to communicate with the ship conveying the annual supplies,—Captain MAGUIRE and his officers found occupation and interest in the observations which form the subject of this Paper, and which, if I mistake not, deserve to be ranked amongst the most important contributions yet made to our knowledge of the magnetic variations of short period.

The instruments which Captain MAGUIRE possessed (supplied from Woolwich) were two dip circles, one of $9\frac{1}{2}$ inches, the other of 6 inches, each with two needles of BARROW'S construction, and a portable declinometer, such as is described in Captain RIDDELL'S useful 'Manual,' pp. 15 and 16, having a perforated magnet of 3 inches in length, carrying a collimator scale in the interior, the divisions of which were read by a detached telescope. The observatory is thus described by Mr. HULL, whose zeal and assiduity in conducting the observations under Captain MAGUIRE'S direction, and accuracy in tabulating them, are spoken of by Captain MAGUIRE in terms of the highest praise:—"The observatory was composed of an outer house of ice, 12 feet square and 7 feet high, within which was another one of seal skin, 7 feet by 6. Two posts, 23 inches apart, were then sunk, and being firmly frozen into the earth, served as supports for the declinometer and reading telescope; whilst another post was placed in the north-western corner for the chronometer, and a pedestal was placed outside the observatory for the dip circle, which was afterwards removed into a separate house, about 15 feet north-west of the observatory. The dip was observed twice a week: we had the misfortune to break two dip needles through awkward handling, owing to the extreme cold. The hourly observations with the declinometer commenced on the 5th of November. We soon discovered that the aurora was connected with the movements of the magnet; the brighter the aurora, the quicker the magnetic changes became; and from repeated observations I came to the conclusion, that the appearance of the aurora in the *South* was connected with the motion of the magnet to the *east* of the magnetic North, and if in the *North*, to the *west* of the same. In addition to these disturbances, considerable irregularities took place in the daytime, generally in the forenoon, and always in cloudy and misty weather. During these disturbances it was no uncommon occurrence for the magnet to go out of the field of the telescope, not returning again for several minutes, and it was generally to the eastward on these occasions. A heavy gale from the S.W. set in on the 17th December, 1852, and occasioned the loss of five days' observations. It had the effect of raising the water 3 feet above the usual level, and at 3 P.M., on going to take the observations, the sea was found washing the wall of the observatory. The northern part of the Spit was at this time entirely free from ice, as was also the channel as far as we could see, which, owing to the heavy drift, could not be above 100 yards. The gale not having moderated, and the water being still on the rise, it was thought advisable to remove the instruments, which was fortunately accomplished without injury. At about 10 P.M. the gale moderated, the sky clearing and showing a most beautiful aurora, when we found that the ice had gone out of the channel. The next day was clear and fine, displaying to us the extraordinary view of open water, with only a few pieces of ice in the horizon. From that time not a week passed without a well-defined water-sky being visible to seaward. On the 21st of December the instruments were replaced: the water had come within 6 inches of the top of the pedestal."

On the 1st of June, 1853, the observatory was unroofed, on account of the increasing heat of the weather, and on the 22nd of June the hourly observations were discontinued, all hands being required to assist in the preparations to meet the vessel at Port Clarence which brought the annual supply of provisions. The observations were again resumed on the 12th of October, 1853, with the same instruments, placed as in the preceding year; and were continued to the 30th of June, 1854, when the 'Plover' finally quitted Point Barrow on her return to England.

The hourly observations of the declination at Point Barrow consist therefore of two series: the first of eight months, from November 1852 to June 1853; and the second of nine months, from October 1853 to June 1854; making, together, seventeen months. The observations were arranged in monthly tables, of the same form as that adopted at the Colonial Observatories, having the monthly, daily and hourly means computed from the whole of the observations without any omissions on account of excessive disturbance. The record was kept in scale-divisions, the value of a scale-division being 2'·287. In this state the Tables were received at Woolwich.

For the purpose of separating the disturbances of largest amount from the rest of the observations, ten scale-divisions above or below the normal at the same hour in the same month were adopted as a suitable measure of what should be regarded as a large disturbance; the corresponding arc value is 22'·87. The number of disturbed observations thus separated was 907 in 1852–53, and 914 in 1853–54. The whole number of observations was 4659 in 1852–53, and 5413 in 1853–54: making, together, 10,072, of which 1821 differed from their respective normals by an amount equalling or exceeding 22'·87; being between one-fifth and one-sixth of the whole number. The aggregate amount of disturbance, counted from the respective normals, was 44156'·0 in 1852–53, and 47388'·2 in 1853–54; of which, in 1852–53, 24823'·0 was easterly, and 19333'·0 westerly disturbance; and in 1853–54, 31935'·1 easterly, and 15453'·1 westerly disturbance. The sum of the easterly values in the seventeen months was 56758'·1, and of the westerly values, 34786'·1. In both series, therefore, the easterly disturbances preponderated; in 1852–53 in the proportion of 1·28 to 1, and in 1853–54 of 2·07 to 1; in both, conjointly, in the proportion of 1·63 to 1. Consequently the influence of the disturbances at Point Barrow was to occasion a small mean deflection of the needle towards the east, thus slightly increasing the easterly declination.

In the following Table the aggregate values of the disturbances in the seventeen months are distributed into the *hours* of their occurrence; and the ratios are given which the values at the different hours bear to the mean of all the hours, or, in other words, to the aggregate values divided by 24.

TABLE I.

Aggregate values of the Disturbances distributed into the different hours of their occurrence.

Local astronomical hours.	Periods ending June 30. 1852–53 (8 months).	1853–54 (9 months).	Sums in the 17 months.	Ratios.	Local civil hours.
18	1974·4	2937·2	4911·6	1·29	6 A.M.
19	3046·7	4580·2	7626·9	2·00	7 A.M.
20	3329·8	4752·4	8082·2	2·12	8 A.M.
21	3564·7	4248·9	7813·6	2·05	9 A.M.
22	2934·4	2921·2	5855·6	1·53	10 A.M.
23	2105·9	1482·8	3588·7	0·94	11 A.M.
0	1328·4	924·3	2252·7	0·59	Noon.
1	1042·4	680·3	1722·7	0·44	1 P.M.
2	769·3	692·7	1462·0	0·38	2 P.M.
3	445·3	490·0	935·3	0·24	3 P.M.
4	643·5	207·9	851·4	0·22	4 P.M.
5	290·6	562·8	853·4	0·22	5 P.M.
6	330·2	414·6	744·8	0·19	6 P.M.
7	1111·8	272·4	1384·2	0·36	7 P.M.
8	1199·2	760·6	1959·8	0·51	8 P.M.
9	1740·5	1046·9	2787·4	0·73	9 P.M.
10	1500·3	1755·3	3255·6	0·85	10 P.M.
11	2682·4	2898·5	5580·9	1·46	11 P.M.
12	2537·6	3262·1	5799·7	1·52	Midnight.
13	2983·8	3037·6	6021·4	1·58	1 A.M.
14	2373·5	2782·5	5156·0	1·35	2 A.M.
15	1852·1	2001·9	3854·0	1·00	3 A.M.
16	1976·5	2114·1	4090·6	1·07	4 A.M.
17	2392·7	2561·0	4953·7	1·29	5 A.M.
		Total	91544·2		
		Mean $\frac{91544·2}{24}$ =	3814·3 =	1·00	

We find in this Table, as at Toronto and elsewhere, unmistakeable evidence of the existence of a law regulating the occurrence of the larger disturbances according to the hours of solar time. From 11 A.M. to 10 P.M. inclusive, the ratios are throughout less than unity; from 11 P.M. to 10 A.M. inclusive, above unity. There are two epochs of maximum and two of minimum disturbance in the twenty-four hours: the principal maximum is from 7 to 9 A.M., when the proportion reaches twice the average amount; the lesser maximum is from 11 P.M. to 1 A.M., when the proportion is about one and a half to one. The principal minimum is from 3 to 6 P.M., when the proportion is less than a quarter of the average; and there is a minor minimum at 3 and 4 A.M.

The accordance in systematic character of the variation at the different hours at Point Barrow with that of the corresponding variation at Toronto, may be seen by means of the following Table (II.), in which the ratios at Point Barrow are exhibited in comparison with those at the same hours of local time at Toronto. There is the same unmistakeable evidence at both stations that the amount of disturbance at the different hours is regulated by a law which has reference to the hours of solar time: and there are similar double epochs of maxima and minima, although the order in which these occur, and the particular times of their occurrence, are not strictly the same; but the differences in these respects will be better discussed and more clearly appreciated when we pass from the consideration of the occurrence of the disturbances in the *aggregate* to that of their distribution into their *easterly and westerly constituents.*

TABLE II.

Ratios of the aggregate Disturbances at the different hours at Toronto and at Point Barrow.

Local astronomical hours.	Ratios.		Local civil hours.
	Point Barrow.	Toronto.	
18	1·29	1·05	6 A.M.
19	2·00	1·17	7 A.M.
20	2·12	1·27	8 A.M.
21	2·05	1·11	9 A.M.
22	1·53	0·87	10 A.M.
23	0·94	0·66	11 A.M.
0	0·59	0·49	Noon.
1	0·44	0·30	1 P.M.
2	0·38	0·40	2 P.M.
3	0·24	0·40	3 P.M.
4	0·22	0·53	4 P.M.
5	0·22	0·56	5 P.M.
6	0·19	0·84	6 P.M.
7	0·36	0·98	7 P.M.
8	0·51	1·22	8 P.M.
9	0·73	1·82	9 P.M.
10	0·85	1·55	10 P.M.
11	1·46	1·25	11 P.M.
12	1·52	1·35	Midnight.
13	1·58	1·52	1 A.M.
14	1·35	1·21	2 A.M.
15	1·00	1·13	3 A.M.
16	1·07	1·34	4 A.M.
17	1·29	1·05	5 A.M.

In Table III. we have the aggregate values of the disturbances at Point Barrow separated into their easterly and westerly constituents, with the ratios at each hour to the mean hourly easterly or westerly value, or to the sums of all the hours divided by 24.

TABLE III.

Local astronomical hours.	Disturbance-values.		Ratios.		Local civil hours.
	Easterly.	Westerly.	Easterly.	Westerly.	
18	3891·9	1019·7	1·65	0·70	6 A.M.
19	6679·5	947·4	2·82	0·65	7 A.M.
20	7610·2	472·0	3·22	0·33	8 A.M.
21	6818·1	995·5	2·88	0·68	9 A.M.
22	4563·6	1292·0	1·93	0·89	10 A.M.
23	2438·2	1150·5	1·03	0·79	11 A.M.
0	920·0	1332·7	0·40	0·92	Noon.
1	797·9	924·8	0·34	0·64	1 P.M.
2	646·9	815·0	0·27	0·56	2 P.M.
3	347·4	587·9	0·15	0·40	3 P.M.
4	341·4	510·0	0·14	0·35	4 P.M.
5	185·0	668·4	0·08	0·46	5 P.M.
6	207·4	537·4	0·09	0·36	6 P.M.
7	315·1	1069·1	0·13	0·74	7 P.M.
8	352·8	1607·0	0·15	1·11	8 P.M.
9	1128·3	1659·1	0·48	1·14	9 P.M.
10	1360·2	1895·5	0·57	1·30	10 P.M.
11	1931·2	3649·7	0·81	2·52	11 P.M.
12	2280·4	3519·3	0·96	2·43	Midnight.
13	2289·1	3732·3	0·96	2·57	1 A.M.
14	2540·4	2615·6	1·07	1·80	2 A.M.
15	2202·2	1651·8	0·93	1·14	3 A.M.
16	2892·3	1198·3	1·22	0·82	4 A.M.
17	4018·6	935·1	1·69	0·64	5 A.M.
Total in the 17 months	56758·1	34786·1			
Mean hourly values... { Easterly =2364·9=1·00; Westerly=1449·4=1·00					

On inspecting the ratios in this Table, it is obvious that the easterly and westerly disturbances have distinct laws in respect to the times of their occurrence. When examining the disturbances in the aggregate in Table II. (in which the easterly and westerly values are combined), we had occasion to observe, as one of the most notable features, the existence of *two* epochs of maximum in the twenty-four hours, one in the morning at 7, 8, and 9 A.M., and one in the evening, or more properly in the night, at 11 P.M., midnight, and 1 A.M.; the morning maximum being considerably the greater. We now perceive by means of the separation which is shown in Table III., that the morning maximum of the aggregate values is occasioned chiefly by the easterly disturbances, and their evening or night maximum chiefly by the westerly disturbances. The easterly values have not even a secondary maximum at 11 P.M. to 1 A.M.; nor have the westerly values a secondary maximum at 7, 8, and 9 A.M. Both the easterly and the westerly have their minimum nearly at the same hours, viz. from 3 to 6 P.M.; and if allowance be made for such small irregularities as we should be prepared to expect in the results of a series of only a few months' continuance, there would appear a strong probability that both easterly and westerly are single progressions, having their respective maxima the easterly about 8 A.M. and the westerly about midnight. In the easterly values in particular the feature of a double progression, or of two maxima or two minima in the twenty-four hours, is almost wholly obliterated; whilst in the westerly, the distinctive character of the second maximum is softened, and the time of its occurrence removed to between 10 A.M. and noon. It may be remarked generally of the easterly disturbances, that they have in all respects their characteristic features more strongly marked than is the case in the westerly disturbances; thus, 8 A.M. is distinctly the hour of the easterly maximum, the values at 8 A.M. exceeding considerably those at 7 or 9 A.M.; and between 5 and 6 P.M. is as distinctly the time of minimum, whether we regard the particular values at those hours, or the low values from 3 P.M. to 8 P.M., between which hours $5\frac{1}{2}$ P.M. is intermediate. The *range* of the easterly variation, or the proportion which the values at the hours of maximum bear to those at the hours of minimum, is also much greater in the easterly than in the westerly disturbances, being nearly as twenty-five to one in the easterly, and not more than about seven to one in the westerly. In the less distinctly marked features of the westerly disturbances, it may be well imagined that a greater continuance of observation may be required to give equally assured conclusions; and that the second minimum, which appears in the westerly at 8 A.M., may be rather an accidental than a persistent feature, and might disappear in a series of longer duration. Admitting this possibility, the westerly variation would in such case approximate even more nearly than it does in Table III. to a single progression in the twenty-four hours, having its maximum about midnight and its minimum about 4 or 5 P.M.: and thus the double progression shown by the aggregate values in Table II. would be resolved, as in some other cases, into two single progressions (easterly and westerly), having different hours of maximum and minimum.

The distinction which has been thus shown to exist between the phenomena of the easterly and westerly disturbances at Point Barrow, is a fitting preparation for the comparison which the next Table presents with the analogous phenomena at Toronto. For reasons, which will subsequently appear, the easterly ratios at Point Barrow have been placed in Table IV. by the side of the westerly ratios at Toronto, and the westerly ratios at Point Barrow by the side of the easterly at Toronto.

TABLE IV.

Exhibiting the ratios at the different hours, at Point Barrow and Toronto, of the values of the easterly and westerly portions of the larger disturbances to their respective mean hourly values.

Local astronomical hours.	Point Barrow, easterly disturbances.	Toronto, westerly disturbances.	Point Barrow, westerly disturbances.	Toronto, easterly disturbances.	Local civil hours.
18	1·65	1·82	0·70	0·45	6 A.M.
19	2·82	2·23	0·65	0·35	7 A.M.
20	3·22	2·58	0·33	0·26	8 A.M.
21	3·88	2·25	0·68	0·21	9 A.M.
22	1·93	1·62	0·89	0·28	10 A.M.
23	1·03	1·00	0·79	0·39	11 A.M.
0	0·40	0·80	0·92	0·24	Noon.
1	0·34	0·41	0·64	0·21	1 P.M.
2	0·27	0·65	0·56	0·20	2 P.M.
3	0·15	0·62	0·40	0·22	3 P.M.
4	0·14	0·80	0·35	0·32	4 P.M.
5	0·08	0·71	0·46	0·44	5 P.M.
6	0·09	0·57	0·36	1·05	6 P.M.
7	0·13	0·39	0·74	1·44	7 P.M.
8	0·15	0·28	1·11	1·95	8 P.M.
9	0·48	0·22	1·14	3·09	9 P.M.
10	0·57	0·45	1·30	2·41	10 P.M.
11	0·81	0·27	2·52	2·02	11 P.M.
12	0·96	0·82	2·43	1·76	Midnight.
13	0·96	1·19	2·57	1·79	1 A.M.
14	1·07	1·00	1·80	1·37	2 A.M.
15	0·93	0·94	1·14	1·28	3 A.M.
16	1·22	1·21	0·82	1·45	4 A.M.
17	1·69	1·23	0·64	0·91	5 A.M.

It is obvious on the mere inspection of Table IV., that the principal analogy is not between the disturbances which deflect the needle in the *same* direction at the two stations, but between those which deflect the needle in *opposite* directions; between the easterly disturbances at Point Barrow and the westerly at Toronto, and between the westerly disturbances at Point Barrow and the easterly at Toronto. Nor is this analogy manifested in slight and unimportant particulars, but on the contrary in the most marked characteristics of both classes of phenomena. Thus, when the average disturbance in the twenty-four hours is taken as the unit, the easterly disturbances at Point Barrow and westerly at Toronto are seen to have the same characteristic distribution, viz. the amount of disturbance at the several hours from noon to about midnight is below unity, and at the hours from a little after midnight to just before noon above unity; whilst on the other hand, the westerly disturbances at Point Barrow and easterly at Toronto accord with each other in presenting a very different distribution, viz. their amount exceeds the average at the four or five hours on either side of midnight, and is below unity at all the other hours of the day and night. The analogy thus manifested in the general distribution of the disturbances is equally strongly marked when particular points are regarded; as, for example, it has been shown, in the earlier part of this communication, that the disturbances both at Point Barrow and at Toronto, when viewed in the *aggregate*, have at each station two very marked and decided maxima in the twenty-four hours, one about 8 A.M., and the other towards midnight; and that when the disturbances at Point Barrow are separated into their easterly and westerly constituents, the night maximum disappears in the easterly and the morning maximum in the westerly values, whilst the morning maximum of the aggregate values is found to consist almost wholly of deflections towards the east, and the night maximum almost wholly of deflections towards the west. Now we may perceive by Table IV., that when the separation is made into easterly and westerly values, and the ratios of each class at the several hours to the respective units are computed, the phenomena at Toronto present an almost precisely corresponding arrangement, but with this essential difference, that the morning maximum of the aggregate values is due at Point Barrow to the great preponderance of easterly values, and at Toronto to the great preponderance of westerly values; and that the evening maximum of the aggregate values is, conversely, due to the great preponderance of westerly values at Point Barrow and of easterly at Toronto.

The hours of *least* disturbance show also a much greater accordance when the easterly ratios at Point Barrow and westerly at Toronto are viewed together, than when any other comparison is made. The amount of disturbance diminishes as soon as the hour of noon is past, and continues comparatively small until much later in the evening than is the case in either the westerly disturbances at Point Barrow or the easterly at Toronto.

Whilst thus endeavouring to bring into view the several circumstances which seem to indicate a connexion subsisting between the disturbances of opposite character at Point Barrow and Toronto, it is well that we should also notice one or two points in which, on the contrary, the easterly disturbances appear to agree with the easterly, and the westerly with the westerly better than either with the opposite. Thus,—1st, the values of greatest comparative magnitude, viz. those in which the proportion exceeds three times the average value, are easterly deflections at both stations, occurring however several hours apart, viz. at 8 A.M. at Point Barrow, and at 9 P.M. at Toronto. It is a consequence of this preponderance of easterly deflection at the two stations, (in the morning at the one station and in the evening at the other,) that the mean influence of the disturbances on the general direction of the needle is the same at both stations, viz. a small increase of east declination at Point Barrow, and a still smaller diminution of west declination at Toronto. 2nd, the highest values of the westerly disturbances at both stations show nearly an equal proportion to their respective units, viz. about $2\frac{1}{2}$ times the mean hourly disturbance-value. The times of occurrence are also in this case very different, viz. at Toronto in the forenoon and at Point Barrow about midnight. At both stations the highest hourly values of the westerly deflections bear about an equal proportion in respect of magnitude to the highest easterly values.

It would be obviously premature to attempt to connect the phenomena thus brought into view, and into comparison with each other, with such physical relations as might be imagined suitable to produce or to explain their accordances and differences. The points on the earth's surface where the periodical laws of the occasional disturbances have hitherto been examined, are too few to furnish a basis for prudent generalization. The *primary* dependence of the disturbances upon the sun seems to be established by the universality with which, wherever they have been examined, their mean effects have exhibited a variation regulated by the hours of solar time; as well as by the evidence which has been uniformly furnished, wherever the investigation has been made, of their participation in the same solar period which appears to govern the increase and decrease in the frequency and amount of the solar spots. Perhaps the next most important questions which present themselves for solution concern the *mode of operation* of the primary or exciting cause; whether, for instance, the phenomena which we observe are the results of the sun's influence, acting independently of the magnetism of the earth,—or of a reaction, in which the specialities of the latter will require to be taken into the account; or whether, as may possibly be the case, the action of the primary cause is modified in different localities by physical considerations of other kinds, such as particular conditions of the earth or of its atmosphere. It may be possible that a further knowledge of the phenomena at a very few additional stations, supposing them to be judiciously distributed, might be sufficient for the solution of these or similar questions; particularly if the observations were to include variations of the magnetic *force* as well as of the magnetic *direction*. The instrumental means and the processes of observation are sufficiently simple. Instruments similar to those which have been so usefully, and so honourably to themselves, employed by Captain MAGUIRE and his officers, have been sent with nearly all the expeditions which, in the last twelve years, have wintered within the Arctic circle; but the maintenance of a routine of hourly observation during several months of compulsory detention, in the absence of authoritative direction or professional encouragement, requires perhaps a greater amount of private zeal and devotion than can be expected, unless in such exceptional cases as the one which has supplied the materials for this communication. In one of these expeditions in particular (the only one that unhappily has not returned in safety), the well-known zeal of its commander Sir JOHN FRANKLIN in the cause of science, and the anxiety of his officers to cooperate with him in every useful and honourable work, gave reason for hopes of the highest promise. In the letters written by the commanders of the 'Erebus' and 'Terror' after their arrival at Baffin's Bay, the full purpose of establishing their magnetic observatories on shore or on the ice, wherever the ships should be detained during a winter, is prominently dwelt upon. They were provided with instruments for the variation of the force as well as of the direction, prepared at Woolwich under the superintendence of my then assistant, Captain RIDDELL. That observations *were* made with these instruments at the first winter station, in 1845–1846, no reasonable doubt can be entertained; or that the observations were repeated at one at least of the subsequent occasions of similar detention in a new locality. The records of these observations, too voluminous to have been brought away by parties setting forth with the prospect of having to make their way across the continent to the Hudson's Bay Stations, could scarcely fail to possess a high scientific value; especially those of the second year, when the situation of the ships was probably intermediate between the meridians of Toronto and Point Barrow. In the Royal Society at least the hope is still cherished that the recovery of these records, amongst the other journals and papers of the 'Erebus' and 'Terror,' may yet recompense the devotion and perseverance with which the research has been pursued. By the aid of the Royal Society, the distinguished officer who has recently quitted our shores for the Polar Sea in command of the Fox Yacht, has been supplied from the Kew Observatory with the necessary instruments for observations of both the magnetic direction and force, to be used at the station where the ship will remain whilst the sledge parties are absent. All that the most zealous and earnest purposes can accomplish may be confidently expected from Captain M'CLINTOCK and his associates in this honourable enterprise; but the number of persons who can be considered as competent to take part in scientific observations is unfortunately but barely sufficient for the conduct of the travelling parties for the primary object for which the enterprise was undertaken. Such opportunities of special scientific research are of rare occurrence; and it is greatly to be regretted that Mr. GRAY, Mate in the Royal Navy, who having served under Captain MAGUIRE in the 'Plover' had been well trained in magnetic observations, and was most desirous to have accompanied Captain M'CLINTOCK, was unable to procure from the Admiralty leave of absence from his employment on the Coast Guard Service.

But, to return to the Point Barrow observations:—It is well known that apparent anomalies have been found in the diurnal variation of the declination in the high magnetic latitudes of the northern hemisphere, when compared with the regular and consistent diurnal march of the phenomena in other parts of the hemisphere. It is usually a principal feature in these anomalies, that the westerly extreme of the diurnal range, which most commonly elsewhere occurs between 1 and 2 P.M., is found to take place later in the afternoon, and even in some cases nearly as late as midnight. A leading step towards the explanation of these apparent anomalies was made, when it was shown that the diurnal variation derived from a mean of *all* the observations must in all instances be regarded as the joint effect of two distinct variations superimposed upon each other, proceeding from different causes and having different laws, viz. the occasional disturbances, and the regular solar variation. Hence it was natural to imagine that in passing from the parts of the hemisphere where the regular solar variation predominated, by reason of its greater amount, to other parts where the disturbance-variation should predominate, differences, of the nature of the so-called anomalies, would present themselves in the results which should comprehend their joint effects. Still, however, in attempting, with the very limited knowledge that was then possessed of the differences that might be supposed to take place in the disturbance-variation in different localities, to apply this mode of explanation to particular cases, doubts have been entertained of its sufficiency to meet the phenomena in all cases. The fact which has now been established by the comparison of the disturbances at Point Barrow and Toronto, that the prevailing disturbance-deflection at certain hours of the day may be easterly at one station whilst it is westerly at another, augments the probability, that, whenever the effects of the two classes of phenomena are separated so that the approximate laws of each may be known, the apparent anomalies will disappear, and the solar variation will be found, after the disturbance-variation has been eliminated, to correspond in its times of easterly and westerly elongation with the order of the phenomena as generally observed in the same hemisphere: whilst on the other hand we may derive from the great dissimilarity in the laws of the disturbance-variation and those of the regular solar variation the salutary caution, that until the disturbance-variation at any particular station has become known by actual investigation, no *certain* inference can be drawn as to its direction or amount at different hours; or as to the modification of the turning-hours which its junction with the solar-diurnal variation may produce.

The subjoined Table (V.) exhibits in parallel columns the diurnal variation at Point Barrow as derived,—1, in column A, from the whole of the observations including the disturbances; it is here the joint effect of both classes of phenomena; and 2, in column B, from the observations when the disturbed observations have been separated and omitted. On comparing these two columns, it is seen that the time of westerly extreme, which, when the whole of the observations are taken into account, falls as late as 11 P.M., is restored in column B, which represents approximately the regular solar-diurnal variation, to the same hour at which it occurs at Toronto, viz. between 1 and 2 P.M. In column D of the same Table, the solar-diurnal variation at Toronto has been reproduced from the third volume of the 'Toronto Observations' (Table LXV. Column 4, p. lxxxviii), for the purpose of facilitating its comparison with the corresponding values in column B. In pursuing this comparison, we find that the characteristics of this variation at the two stations are as nearly the same as can reasonably be expected, considering that it is only the *larger* disturbances that have been separated, and that some minor effects of the same class must still remain in the body of the observations after the removal of the disturbances of greatest magnitude. Thus we find at both stations that the north end of the magnet is at its easterly extreme about 7 or 8 A.M.; that in returning from thence towards the west its motion is more rapid than at any other part of the twenty-four hours; and that it passes through its mean direction about 11 A.M., and reaches its westerly extreme a little after 1 P.M. Its subsequent motion, towards the east, is comparatively slower at Point Barrow than at Toronto, and is checked at both stations by a small retrogression towards the west, which is greatly diminished both in continuance and amount by the omission of the larger disturbances, marking thereby the source to which it is most probably due. The most notable difference which we find in the comparison of columns B and D is, as already noticed, that the return towards the east during the hours of the afternoon and night takes place comparatively more slowly at Point Barrow than at Toronto. At the latter station the magnet passes through its mean direction between 7 and 8 P.M., whereas at Point Barrow it does not do so until 1 or 2 A.M. Now this is precisely what should take place on the supposition that a portion of the easterly disturbance-variation at Toronto, and of the westerly disturbance-variation at Point Barrow at those hours remains (as is undoubtedly the case) in the body of the observations after the separation of the *larger* disturbances. The prevailing disturbances are easterly at Toronto and westerly at Point Barrow from 6 to 7 P.M. until 3 to 4 A.M.; and the influence of that portion of them which is not separated must necessarily have the effect of augmenting the rapidity of the easterly motion at Toronto, and of retarding it at Point Barrow.

TABLE V.

Diurnal Variation of the Declination at Point Barrow, derived from the mean of seventeen months of hourly observation. Column A shows the results when the large disturbances are retained; Column B the results when the large disturbances are omitted; and Column C the differences, or the diurnal variation due to the large disturbances. Column D shows (for the purpose of comparison with B) the diurnal variation at Toronto omitting the large disturbances.

Local astronomical hours.	Point Barrow. Retaining the large disturbances.	Point Barrow. Omitting the large disturbances.	Point Barrow. Diurnal variation due to the large disturbances.	Toronto. Omitting the large disturbances.	Local civil hours.
	A.	B.	C.	D.	
18	19′·3 E.	14′·6 E.	4′·7 E.	3′·0 E.	6 A.M.
19	27·1 E.	15·2 E.	11·9 E.	4·0 E.	7 A.M.
20	27·0 E.	12·7 E.	14·3 E.	4·4 E.	8 A.M.
21	19·9 E.	8·2 E.	11·7 E.	3·6 E.	9 A.M.
22	9·3 E.	3·8 E.	5·5 E.	1·2 E.	10 A.M.
23	0·4 W.	1·4 W.	1·0 E.	1·7 W.	11 A.M.
0	8·2 W.	4·8 W.	3·4 W.	4·0 W.	Noon.
1	10·7 W.	8·2 W.	2·5 W.	5·1 W.	1 P.M.
2	9·8 W.	7·5 W.	2·3 W.	4·9 W.	2 P.M.
3	9·9 W.	7·2 W.	2·7 W.	3·8 W.	3 P.M.
4	9·8 W.	7·2 W.	2·6 W.	2·5 W.	4 P.M.
5	10·2 W.	7·0 W.	3·2 W.	1·3 W.	5 P.M.
6	9·7 W.	6·7 W.	3·0 W.	0·5 W.	6 P.M.
7	8·4 W.	4·4 W.	4·0 W.	0·1 W.	7 P.M.
8	9·0 W.	3·8 W.	5·2 W.	0·2 E.	8 P.M.
9	7·5 W.	3·9 W.	3·6 W.	0·5 E.	9 P.M.
10	7·9 W.	4·4 W.	3·5 W.	0·7 E.	10 P.M.
11	11·5 W.	5·2 W.	6·3 W.	0·7 E.	11 P.M.
12	10·8 W.	5·3 W.	5·5 W.	0·6 E.	Midnight.
13	8·0 W.	2·8 W.	5·2 W.	0·5 E.	1 A.M.
14	1·9 W.	0·6 E.	2·5 W.	0·5 E.	2 A.M.
15	3·6 E.	4·4 E.	0·8 W.	0·7 E.	3 A.M.
16	10·9 E.	9·0 E.	1·9 E.	1·1 E.	4 A.M.
17	16·6 E.	11·4 E.	5·2 E.	1·9 E.	5 A.M.

It must be regarded as a strong confirmation of the propriety of considering the regular solar-diurnal variation and the disturbance-variation as distinct classes of phenomena, requiring their respective laws to be separately investigated, when we see the correspondence between the principal features of the one variation (the regular solar-diurnal), and the antagonism of those of the other (the disturbance-variation), exemplified as they are at Point Barrow and Toronto; the epochs of extreme easterly and of extreme westerly deflection being the same in the solar-diurnal variations, and nearly opposite to each other in the disturbance-variations. The primary cause of the phenomena is doubtless the same in both variations; they manifest alike the influence of the solar hours, and are subject alike to the same alternate periods of increase and decrease as the solar spots; but the mode of action, or the processes by which the effects are produced in the two classes, can scarcely be otherwise than dissimilar. It seems probable that (omitting for the present the consideration of the magnitudes) the general characters of the solar-diurnal variation will be found to correspond,—*i. e.* the hours of the easterly and westerly extremes to be the same,—in all the extra-tropical parts of the same hemisphere; whilst in the case of the disturbance-variation it seems also probable that every diversity in the times of occurrence of the turning-hours may be found in different localities.

In the hypotheses which physicists have framed to account for the times at which the solar-diurnal variation changes its direction from west to east and from east to west, it has been sometimes supposed that the variable *amount of the declination* in different localities is one of the determining circumstances. The observations at Toronto and Point Barrow do not favour this supposition: the declination at Point Barrow (taken to the nearest degree) is 41° East, and at Toronto 2° West; there is consequently an angular difference in the magnetic direction at the two stations of about 43°, which is nearly equivalent to three hours of time in the sun's azimuth relatively to the direction of the needle, whilst the conclusion from the observations in regard to the turning-hours is, that they are the same at Toronto and Point Barrow, or at most have only such small differences as may reasonably be ascribed to the presence of the small portion of the disturbances which we are unable to eliminate.

With respect to the comparative *magnitudes* of the range of the solar-diurnal variation at Toronto and Point Barrow, and to the proportion which the difference in magnitude bears to the difference in the horizontal force of the earth at the two stations, we may obtain an approximate conclusion, by comparing the amounts of deflection at 1 P.M., when the solar-diurnal variation at both stations has nearly reached its western extreme, and when the influence of the disturbances is nearly at a minimum. The deflections at 1 P.M. are 5′·1 at Toronto, and 8′·2 at Point Barrow. The absolute values of the horizontal force of the earth (which is the antagonistic force to all the minor variations, tending to retain the magnet in its mean position) are about 3·53 at Toronto and 1·79 at Point Barrow. In accordance with the inverse ratio of these values, we should have a deflection of 10′, instead of 8′·2, at Point Barrow, as the corresponding deflection to 5′·1 at Toronto. The range observed at Point Barrow is therefore a little less than the range which might be computed from the amount of deflection at Toronto. But the data upon which the comparison is based, particularly the amount at Point Barrow, can only be regarded as approximate, and will by no means justify a more precise conclusion, than that the observed ranges appear to be *nearly* in the inverse proportion of the respective values of the horizontal force.

But when we turn our attention to a comparison of the magnitudes of the range of the *disturbance-variation* at the two stations, we cannot fail to be impressed with the excessive disproportion which we perceive between the decrease of the earth's horizontal force and the increase in the range of the disturbance-variation at Point Barrow, when compared with Toronto. At the latter station the whole range of the mean diurnal effect of the disturbances scarcely exceeds 2'·0, whilst at Point Barrow it is not less than nine or ten times that amount. The disproportion would have been still greater if the collimator scale of the Point Barrow declinometer had permitted the disturbances of largest amount to have been registered at their full value. During the seventeen months of observation the magnet was forty times* deflected beyond the limits of the scale; in such cases the extreme cognisable division on the side of the deflection was the amount entered in the Table, although, of course, the actual deflection must have been greater. The collimator scale comprised 160 divisions, each of the value of 2'·287; and as the mean position corresponded nearly with the 80th scale-division, it follows that when a deflection exceeded about 180' (or 3°) on either side of the mean position, the excess, could it have been registered, must have increased, *pro tanto*, the sum of the disturbances. The disproportion would also have been considerably greater, if the amount adopted as the standard value of a large disturbance at Point Barrow, and employed in separating the observations belonging to that category, had been more nearly proportional to the inverse ratio of the horizontal force there and at Toronto. In such case, all the observations at Point Barrow, which differed more than about 10' from the normal at the same month and at the same hour, would have been classed amongst the large disturbances. But it was soon found that the disturbances at Toronto and Point Barrow bore no such analogy to each other. Even with 22'·86 (instead of 10') as the measure of a large disturbance, the proportion of disturbed observations to the whole number was still much greater than at Toronto, where 5'·0 was taken as the measure of a large disturbance. It seems scarcely possible, therefore, to avoid the conclusion, that the average amount of deflection caused by the occasional disturbances at Point Barrow is *very considerably* greater, when compared with the same at Toronto, than can be explained by the difference of the horizontal force of the earth at the two stations.

A circumstance which strikingly accords with the excessive amount of the occasional disturbances at Point Barrow, is the great frequency with which appearances of the

* Of the 40 instances in which the deflection exceeded the limits of the recording scale, 30 were deflections to the east and 10 to the west; 24 occurred between the hours of 5 A.M. and noon, of which 22 were to the east and 2 to the west; 22 of the easterly deflections occurred from 19^h to 21^h inclusive, and 6 of the westerly from 11 P.M. to 1 A.M. inclusive. Referring to Table V., it will be seen that, if the instrumental means had permitted these deflections to have been registered at their full values, the principal effect must have been to have increased the ratios of easterly disturbance at Point Barrow at the three hours of 19, 20 and 21, which were previously the hours of its maximum; and in like manner to have increased the ratios of westerly disturbance at 11, 12 and 13 hours, which were the hours of its maximum.

aurora are registered, and which much exceeds, I believe, any previous record of the kind. It was the custom of Captain MAGUIRE and his officers to make a distinguishing mark opposite to the entry of every hourly observation of the declinometer when aurora was visible; and in the Tables received at Woolwich, the observations so distinguished are written in red ink, and those when no aurora was visible, in black ink. In the months of December, January and February, in which months there was scarcely any daylight, and the sky was generally freest from clouds, we find, in the first year, the whole number of hourly observations in the three months to have been 1786; the number at which aurora was seen, 464; and the number at which it was either not present or obscured by clouds, 1322; and in the same three months of the second year, the numbers were respectively 1837, 615 and 1222. Thus, in the six months, there were 1079 hours when aurora was seen contemporaneously with the declinometer observation, and 2544 hours at which it was either not present or not visible; in other words, aurora was actually seen contemporaneously with little less than one-third the number of hourly observations in the six months. The hours when aurora was most common were from 7 P.M. to 7 A.M.; and if we examine on how many days in the above-named six months the aurora was seen, and on how many days it was not seen, we find that it was seen between 7 P.M. and 7 A.M. on 131 days, and that it was not seen (during the whole twenty-four hours) on 22 days; or, as it may be otherwise stated, during the months of December, January and February, in two successive years, the aurora was actually seen six days out of every seven.

When the 1079 observations of the aurora are distributed into the different hours of their occurrence, we find them to have been as follows:—

TABLE VI.

Showing the number of times that the Aurora is recorded to have been seen at the several observation-hours in the months of December, January, and February 1852–1853, and in the same months in the following year.

Hours of local civil time.	Number of auroras observed.	Hours of local civil time.	Number of auroras observed.	Hours of local civil time.	Number of auroras observed.	Hours of local civil time.	Number of auroras observed.
6 A.M.	66	Noon.	0	6 P.M.	30	Midnight.	85
7 A.M.	54	1 P.M.	0	7 P.M.	56	1 A.M.	103
8 A.M.	28	2 P.M.	0	8 P.M.	56	2 A.M.	98
9 A.M.	10	3 P.M.	0	9 P.M.	60	3 A.M.	95
10 A.M.	2	4 P.M.	5	10 P.M.	77	4 A.M.	80
11 A.M.	0	5 P.M.	15	11 P.M.	88	5 A.M.	71

We perceive by this Table, that there is not a single instance recorded of the aurora having been seen between 11 A.M. and 3 P.M., both hours included; and as there is little or no daylight at these hours during the months in question, the *general absence* of aurora (and not merely its *invisibility*) in this part of the twenty-four hours may fairly be inferred. The most frequent hour of its appearance is 1 A.M.; and the great degree of regularity in the decrease of the numbers on either side of the maximum is a very remarkable feature. The progression bears a very close resemblance and analogy to that of the *westerly* disturbances at Point Barrow, as seen in Table IV., and appears to have little or nothing in common with the progression of the easterly disturbances at Point Barrow in the same Table.

The presence of aurora is however by no means to be regarded as an indication of the contemporaneous existence of a disturbance of sufficient magnitude to be admitted into the category of the "disturbed" observations of this paper. In the six months referred to, in which the aurora was recorded at 1079 hours, only 272 of the contemporaneous observations were, in this sense, "disturbed," and 807 were not so; *i. e.* 272 out of 1079, or only about one-fourth of the observations made during the recorded presence of the aurora, differed as much as 22′·86 from the normal at the same hour and in the same month.

Of the fact, that the aggregate amount of disturbance at Point Barrow, when compared with Toronto, greatly exceeds the calculation founded on the inverse proportion of the horizontal force at the two stations, there can be no reasonable doubt. To what is this disproportion owing? Is it, as some may suppose, that Point Barrow is situated nearer than Toronto to the locality where the greatest intensity of disturbance is manifested? If it be so,—and this, be it remembered, is a question which admits of being ascertained by future investigations, similar to the present, at stations suitably chosen,—the question which will immediately present itself will be, by what peculiar physical or other conditions the locality of the greatest intensity of disturbance is distinguished. In the mean time, the widely dissimilar proportions of the disturbance-variation, and of the solar-diurnal variation, at Point Barrow and Toronto, supply additional evidence of the distinct laws by which the two classes of phenomena are governed, and of the necessity of their being separately studied *.

* The disturbances at Point Barrow do not appear to give support to a conjecture that has been recently expressed, that the "occasional disturbances may possibly include two distinct classes of changes, obeying separate laws, one of them being strictly periodic and constituting a part of the regular diurnal change, whilst the other is strictly abnormal and simultaneous at different stations." The regular diurnal change at Point Barrow has its greatest *easterly* elongation about 7 A.M., which is nearly the hour of the greatest *westerly* disturbance-variation; and its greatest *westerly* elongation about 1 P.M., at which time the disturbances, both easterly and westerly, are nearly a minimum. The indications of the phenomena seem therefore to be as nearly opposed as can well be to the conjecture referred to. It is quite true that if the attempt be made to obtain the laws of the disturbances from observations *from which the effects of the regular diurnal variation have not been previously eliminated*, the laws so obtained will include "two distinct classes of changes, obeying separate laws, one of them constituting a part of the regular diurnal variation." But when suitable processes have been employed, by which the mean influence of the regular diurnal variation has been eliminated from the observations which are used in examining the periodic laws of the disturbances, and when the characteristic value of a large disturbance has been taken in proper proportion to the ordinary range of the diurnal variation, I have not found in any case an indication of an admixture in the disturbance laws of an element corresponding in its turning-hours, &c. to the periodic laws of the regular solar-diurnal variation.—Sept. 5, 1857.

The dip of the needle was observed usually twice in each week, sometimes with the 9½-inch circle, and sometimes with the 6-inch. From October 1852 to June 1853 inclusive, 74 observations of the dip were made, and from October 1853 to June 1854 inclusive, 71. The abstract of the monthly results obtained by these observations is contained in the following Table.

TABLE VII.

Mean Dip of the Needle obtained in each Month.

Months.	Circle employed.	No. of observations.	Dip.	Months.	Circle employed.	No. of observations.	Dip.
	in.		° ′		in.		° ′
1852. October	6	6	81 38·7 N.	1853. October	9½	5	81 32·8 N.
„ November	9½	11	81 30·0	„ November	9½	10	81 34·5
„ December	9½	8	81 32·8	„ December	9½	9	81 32·3
1853. January	9½	9	81 33·4	1854. January	6	8	81 31·8
„ February	6	9	81 39·9	„ February	6	6	81 36·3
„ March	9½	8	81 39·0	„ March	6	9	81 38·3
„ April	9½	8	81 42·4	„ April	9½	8	81 34·0
„ May	9½	9	81 33·9	„ May	9½	10	81 37·8
„ June	6	6	81 34·3	„ June	9½	6	81 42·4
Mean 1852–1853		74	81 36·0	Mean 1853–1854		71	81 35·6

Of the 18 monthly determinations, 12 were observed with the 9½-inch circle and 6 with the 6-inch. The mean of the 12 with the 9½-inch is 81° 35′·4 N., and the mean of the 6 with the 6-inch is 81° 36′·6 N.

There are also Term Observations of the Declination at 5′ intervals on twenty term days, *i. e.* from November 1852 to July 1854 inclusive, omitting August 1853. These are reserved at Woolwich, in the hope of finding that corresponding observations were made elsewhere. It is much to be feared that few, if any, corresponding observations will be found to have been made over the whole extent of the North American Continent.

The hourly observations at Point Barrow which have furnished the results discussed in this paper, are printed in the following pages. The observations recorded during the presence of aurora are distinguished by an asterisk prefixed.

HOURLY OBSERVATIONS

OF THE

MAGNETIC DECLINATION AT POINT BARROW,

1852, 1853, 1854.

Point Barrow, 1852; Lat. 71° 21′ N. Long. 156° 15′ W. Magnetic Declination.
One Scale-division = 2′·286. Increasing numbers denote increasing Easterly Declination.

Month	Mean Point Barrow Time.	0h.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	8h.	9h.	10h.	11h.
	D.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.
November.	1												
	2												
	3												
	4												
	5	......	......	82·5	75·0	77·0	74·2	78·0	70·0	75·0	*73·0	*78·0	*85·0
	6	73·5	77·5	78 0	79·0	77·0	75·5	......	......	......	......	......	......
	7	......	......	......	......	......	......	......	......	......	......	75·0	74·0
	8	77·5	77·7	76·5	77·2	70·5	78·0	77·5	74·5	79·0	79·0	78·0	*76·0
	9	78·2	78·0	78·5	77·7	77·0	76·0	65·5	75·0	*62·0	*73·0	70·0	78·2
	10	80·0	79·0	80·0	77·5	75·0	78·0	*74·0	*71·3	*80·0	*57·0	*74·0	*51·0
	11	73·0	78·0	72·0	76·0	62·0	85·0	87·2	86·0	85·5	53·0	*50·0	58·0
	12	87·0	73·2	70·8	78·0	89·2	86·0	81·0	74·0	72·0	88·0	68·0	*(a)
	13	73·0	72·0	73·0	77·2	79·0	79·0	65·0	*74·5	*(a)	*15·0	81·5	71·0
	14	......	......	......	......	......	......	......	......	......	......	......	......
	15	80·0	72·0	73·0	75·0	76·0	75·0	77·2	77·0	77·0	72·2	91·7	76·5
	16	72·0	59·2	64·7	68·0	70·0	70·0	73·0	*68·0	*48·0	*69·0	*75·0	*46·0
	17	66·2	73·5	75·0	76·5	75·0	75·5	83·0	73·0	76·0	59·0	72·0	15·2
	18	71·0	72·0	72·0	72·0	75·0	65·0	74·5	69·8	76·0	*73·5	*71·0	*77·0
	19	76·0	78·0	69 0	72·0	74·0	75·0	70·0	70·0	75·0	67·0	76·0	70·0
	20	75·0	74·0	73·7	77·7	77·0	73·0	75·0	74·0	75·0	75·0	75·0	75·0
	21	......	......	......	......	......	......	......	......	......	......	......	......
	22	79·0	77·0	79·0	72·0	73·0	75·8	77·5	75·2	78·0	78·0	*75·0	*76·0
	23	74·0	76·0	74·0	71·0	68·0	75·0	72·0	78·0	76·0	81·0	75·2	72·0
	24	65·0	78·0	77·5	78·5	82·0	74·0	75·0	76·0	74·0	76·0	79·0	76·0
	25	74·0	76·0	72·0	67·5	70·0	79·0	75·3	80·0	75·0	75·5	79·0	75·0
	26	79·0	66·5	53·5	72·1	*76 0	*88·5	*80·0	*74·0	76·5	94·0	*102·0	80·2
	27	80·0	76·0	71·0	83·0	84·0	76·0	76·0	76 0	77·0	77·0	75·0	75·2
	28	......	......	......	......	......	......	......	......	......	......	......	......
	29	71·2	72·0	70·0	71·5	69·0	75·0	73·0	78·0	74·0	74·0	74·0	73·0
	30	69·0	72·0	72·0	69·0	74·0	70·0	62·0	63·5	33·5	71·8	*66·0	85·0
December.	1	64·7	73·0	74·0	71·0	71·0	73·0	69·0	73·0	65·0	69·0	*82·0	*108·0
	2	71·0	71·7	71·0	70·9	72·0	74·0	76·5	*62·0	*95·0	*62·0	*100·0	*37·0
	3	75·0	60·5	67·5	67·0	72·0	71·0	69·0	72·0	71·5	72·5	73·0	72·0
	4	66·0	74·0	70·0	70·0	72·0	72·0	71·0	*62·4	77·5	69·0	69·5	66·0
	5	......	......	......	......	......	......	......	......	......	......	......	......
	6	81·0	75·3	76·2	76·5	79·6	80·0	80·5	79·0	78·0	76·0	*78·0	*60·0
	7	73·0	77·0	75·0	76·0	71·5	77·0	*75·5	*86·0	*82·0	*73·2	*89·0	*72·0
	8	73·0	65·0	68·0	72·0	76·0	78·0	*74·0	*88·0	76·7	*56·5	*69·0	*75·0
	9	65·0	66·0	78·0	76·0	72·0	75·0	73·0	*66·5	*70·0	*71·7	*79·7	71·1
	10	75·5	68·0	75·0	73·0	72·7	78·5	78·0	*83·0	81·0	*72·5	*85·0	*88·0
	11	75·0	75·0	78·5	79·0	77·5	87·0	73·0	*78·0	*75·0	*76·0	*75·0	*110·0
	12	......	......	......	......	......	......	......	......	......	......	......	......
	13	72·3	75·0	79·5	59·0	75·0	70·0	81·0	107·0	90·0	*87·0	*76·0	*100 0
	14	68·0	79·6	79·0	72·0	52·0	*79·0	85·0	76·0	99·0	*81·0	*77·0	*82·0
	15	79·0	73·0	77·0	79·0	78·0	80·0	80·0	*80·0	*76·0	*89·0	*86·3	*77·0
	16	81·0	82·0	81·0	86·0	81·0	79·5	76·5	80·0	81·0	80·0	81·5	83·0
	17	83·0	85·3	82·0	......	......	......	......	......	......	......	......	......
	18												
	19												
	20												
	21	......	......	......	82·0	84·0	89·0	86·0	86·0	87·0	85·0	86·5	82·3
	22	77·5	77·0	85·3	81·3	82·0	85·7	77·0	*82·3	*85·5	87·7	80·0	92·0
	23	89·0	72·0	89·0	92·0	86·0	81·0	87·2	89·0	91·5	87·7	91·2	90·0
	24	81·0	82·0	77·0	82·0	89·0	75·0	80·0	86·7	84·0	85·0	87·5	84·0
	25	75·0	75·5	85·5	83·3	84·5	84·0	87·0	84·5	80·0	*145·0	74·0	81·0
	26	......	......	......	......	......	......	......	......	......	......	......	......
	27	83·0	82·0	86·0	82·0	83·0	81·0	85·0	86·0	88·0	77·0	86·0	90·0
	28	94·0	82·0	......	......	75·0	*69·0	*78·0	*65·7	*43·0	106·0	73·0	*67·0
	29	80·0	82·0	86·0	86·0	*79·5	*78·0	*80·2	*80·0	88·0	83·0	90·0	82·7
	30	86·0	84·0	87·0	86·0	85·7	85·0	83·0	86·0	87·0	85·0	*86·0	87·0
	31	85·7	84·0	83·0	86·0	87·0	83·0	86·0	*84·0	81·5	83·0	83·0	81·0

Observations noted with a * were made when the Aurora was visible. (a) Off Scale West.

Point Barrow, 1852; Lat. 71° 21′ N. Long. 156° 15′ W. Magnetic Declination.
One Scale-division =2′·286. Increasing numbers denote increasing Easterly Declination.

12h.	13h.	14h.	15h.	16h.	17h.	18h.	19h.	20h.	21h.	22h.	23h.	Mean Point Barrow Time.	
sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	D.	
												1	November.
												2	
												3	
												4	
*105·0	73·0	82·7	81·2	82·0	83·0	92·3	96·0	79·3	69·0	87·2	75·0	5	
......	......	......	......	......	......	......	......	......	......	......	......	6	
77·0	75·0	87·0	81·0	88·0	81·0	85·0	86·0	88·0	85·0	80·2	76·5	7	
*84·0	92·8	78·0	89·0	81·7	80·0	83·2	91·0	95·0	86·2	84·5	78·0	8	
77·5	85·0	*75·0	......	......	......	......	......	......	......	82·0	81·0	9	
*71·0	72·0	*76·0	85·2	89·0	80·0	89·0	92·0	156·5	118·7	116·5	61·0	10	
78·7	79·0	81·0	85·0	86·0	115·0	94·0	89·0	94·0	106·0	86·0	107·0	11	
60·0	53·0	68·0	63·7	*132·0	23·0	*(a)	*93·5	88·2	1·7	84·2	76·0	12	
89·0	78·5	......	......	......	......	......	......	......	......	......	......	13	
......	......	*81·0	84·0	82·0	79·5	97·0	94·0	78·5	74·0	81·7	80·0	14	
76·0	73·0	80·0	83·0	92·0	76·0	80·2	90·0	75·0	87·5	61·5	85·0	15	
78·5	77·0	73·5	92·2	85·6	82·0	92·0	95·0	79·0	76·0	84·0	78·0	16	
89·0	84·0	79·0	104·0	86·5	94·0	......	83·5	89·5	68·0	68·5	71·0	17	
76·0	78·0	54·0	78·0	84·0	81·0	86·0	93·0	85·5	82·5	77·0	74·0	18	
78·0	75·0	68·0	86·5	76·0	76·0	76·0	75·0	78·0	75·0	75·0	75·0	19	
75·7	76·7	......	......	......	......	......	......	......	......	......	......	20	
......	80·0	80·0	78·5	79·5	80·0	81·3	78·0	77·7	85·0	84·0	75·0	21	
73·2	*84·0	78·0	65·0	82·0	84·0	95·0	84·0	87·5	89·0	82·0	74·7	22	
75·0	73·0	75·0	86·0	82·0	85·0	81·2	88·0	95·0	90·0	98·0	63·0	23	
82·5	85·5	55·2	78·0	76·3	79·0	82·0	83·0	87·0	86·0	82·0	72·0	24	
79·0	79·0	76·5	78·5	79·0	70·0	84·0	135·1	80·0	95·0	62·0	82·0	25	
96·0	*76·4	*53·0	84·3	106·5	*66·5	82·8	93·4	71·6	96·0	92·7	77·5	26	
73·7	73·5	......	......	......	......	......	......	......	......	......	......	27	
......	79·5	72·3	77·0	74·3	77·0	79·0	78·0	77·5	77·2	79·0	76·0	28	
74·0	75·0	73·7	*65·0	69·0	87·0	81·0	70·7	75·5	73·0	78·0	77·0	29	
78·5	87·2	76·0	*78·0	72·0	83·5	70·0	72·5	75·0	78·0	72·0	69·5	30	
*114·5	*(a)	*78·0	*82·0	*89·0	105·0	68·2	135·0	73·0	58·0	70·0	67·5	1	December.
*20·0	*90·0	86·0	70·3	*79·0	69·0	79·0	76·0	73·0	77·0	61·0	80·0	2	
73·0	70·0	71·0	*75·5	75·0	74·0	81·0	88·8	*108·0	89·0	82·0	65·0	3	
69·0	67·0	......	......	......	......	......	......	......	......	......	......	4	
......	*74·0	*83·0	*82·0	*78·0	*95·0	*83·0	*66·0	84·0	83·0	91·0	82·0	5	
*83·0	*88·6	*69·0	*87·0	*82·5	*85·0	*91·5	*94·0	85·0	125·0	92·0	78·0	6	
*67·2	*80·0	*78·0	*83·0	*82·0	*76·9	*84·0	*112·2	*119·8	95·0	96·0	80·0	7	
*77·0	*66·0	*89·0	*86·0	*99·0	*83·0	*97·0	*79·0	*92·0	81·0	86·0	66·5	8	
152·5	*55·0	83·5	89·0	*103·0	77·0	76·0	104·0	105·0	76·5	73·5	61·0	9	
*88·0	*102·7	*53·5	*69·7	*84·0	95·0	105·0	81·5	81·0	78·0	83·0	86·0	10	
67·3	*50·0	......	......	......	......	......	......	......	......	......	......	11	
......	*95·2	*87·0	*84·0	62·0	*107·0	*105·0	*109·0	*120·0	50·3	94·0	76·0	12	
83·0	86·0	78·0	*67·5	84·5	79·0	83·0	108·0	76·2	82·5	81·5	85·0	13	
*78·0	*77·5	*82·0	*77·5	*84·5	82·0	89·0	*87·0	86·5	76·0	80·0	80·0	14	
*81·0	*80·5	*81·0	86·5	92·0	88·7	83·3	91·4	80·0	83·5	83·0	81·0	15	
80·0	90·0	91·0	96·0	89·0	88·5	93·0	87·5	103·0	84·0	79·7	82·0	16	
......	......	......	......	......	......	......	......	......	......	......	......	17	
												18	
												19	
												20	
87·0	87·5	87·0	85·0	84·0	90·0	91·2	93·0	90·0	103·0	98·0	101·0	21	
85·0	87·3	73·3	*77·5	96·8	105·3	107·9	125·0	100·9	99·7	110·0	69·0	22	
70·0	67·0	72·0	89·0	83·0	91·0	80·0	100·7	133·5	91·0	77·5	80·0	23	
82·5	93 5	100·0	92·0	89·0	92·0	112·0	82·0	87·0	96·0	80·0	88·5	24	
88·0	86·0	......	......	......	......	......	......	......	......	......	......	25	
......	87·7	87·0	84·0	88·0	85·5	86·0	85·0	87·0	90·0	(a)	80·0	26	
88·0	61·5	90·0	91·0	97·0	117·5	92·0	104·0	92·0	92·0	90·0	95·0	27	
*78·5	81·0	83·0	96·0	110·0	*104·0	*111·0	*102·0	122·5	119·0	102·0	114·0	28	
70·0	70·5	19·5	91·0	85·0	85·0	85·0	85·2	85·0	83·0	87·5	85·0	29	
*104·0	*83·0	*92·0	*90·5	86·0	90·0	91·5	88·0	86·0	87·0	87·0	86·8	30	
87·0	*92·0	*96·0	*84·0	*92·0	85·0	91·0	100·3	98·0	95·0	82·0	85·0	31	

(a) Off Scale West.

Point Barrow, 1853; Lat. 71° 21′ N. Long. 156° 15′ W. Magnetic Declination.
One Scale-division =2′·286. Increasing numbers denote increasing Easterly Declination.

Mean Point Barrow Time.		0h.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	8h.	9h.	10h.	11h.
	D.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.
January.	1	77·3	82·3	81·0	80·0	*85·0	*91·0	*86·0	*80·0	*84·0	*71·0	*73·0	*72·0
	2	......	......	......	......	......	......	......	......	......	......	......	......
	3	92·0	83·0	82·1	85·0	85·0	86·0	87·0	87·0	89·0	89·0	*90·5	*92·5
	4	84·0	85·0	86·0	89·0	88·0	89·5	86·0	88·0	88·5	89·0	89·0	88·0
	5	92·5	95·0	86·3	88·0	86·0	89·0	*82·5	*91·0	*93·7	87·0	*89·0	*92·0
	6	95·0	89·0	85·0	88·0	89·0	*85·0	*86·0	*86·0	*85·0	*79·0	*121·0	*94·0
	7	94·0	86·0	84·5	85·0	87·0	89·5	82·0	89·0	*86·0	*91·0	*86·0	*62·0
	8	89·0	78·0	83·0	87·0	91·0	88·0	83·0	92·0	103·5	105·5	82·0	75·0
	9	......	......	......	......	......	......	......	......	......	......	......	......
	10	96·0	92·0	86·0	91·0	93·0	82·0	90·0	87·0	91·0	92·0	94·0	91·0
	11	99·0	91·0	92·0	97·7	92·0	92·0	92·5	91·0	92·0	91·0	90·5	*88·0
	12	92·0	87·0	89·0	90·0	93·0	85·0	92·5	85·0	92·0	92·0	86·0	*90·0
	13	89·0	84·0	83·0	87·0	82·5	84·0	*86·0	*91·0	89·0	89·0	*91·0	*94·5
	14	93·0	80·0	85·0	86·0	88·0	*86·0	*84·0	*95·0	*90·0	*101·0	*93·0	*91·0
	15	91·0	88·0	90·0	85·0	92·0	81·0	92·0	*86·0	*92·5	*93·0	*94·0	*92·0
	16	......	......	......	......	......	......	......	......	......	......	......	......
	17	88·0	89·0	86·8	84·0	82·0	92·0	*90·0	*88·0	*89·7	*89·0	*85·0	*92·5
	18	80·0	74·0	63·0	78·0	83·0	76·0	76·0	*70·0	*81·0	*86·5	*80·0	*70·0
	19	77·0	75·0	80·3	70·0	79·0	80·0	81·0	81·0	83·2	81·5	81·7	80·7
	20	84·0	78·0	80·0	86·0	82·0	80·0	77·0	80·0	81·0	80·0	*82·0	*103·0
	21	82·5	81·0	82·0	81·0	81·0	86·0	81·0	80·5	85·0	83·0	82·0	72·0
	22	82·3	86·0	82·0	81·0	81·0	82·0	83·0	83·0	86·0	83·0	83·3	81·0
	23	......	......	......	......	......	......	......	......	......	......	......	......
	24	80·0	80·0	82·0	81·0	79·0	80·0	80·0	73·5	76·0	92·0	82·0	81·0
	25	78·0	79·0	79·0	82·0	84·0	83·0	86·0	82·0	81·0	84·2	84·0	83·0
	26	83·0	83·0	82·0	76·0	79·0	83·0	82·0	84·0	82·0	81·0	82·5	81·0
	27	85·0	81·0	82·5	81·5	80·0	79·0	*82·0	*78·5	*79·0	*80·0	*78·0	*81·0
	28	82·0	79·0	81·0	83·0	85·0	79·0	80·0	83·0	84·0	82·2	81·0	82·0
	29	82·0	84·0	80·5	79·0	78·0	77·0	78·5	80·0	86·0	82·0	79·5	95·0
	30	......	......	......	......	......	......	......	......	......	......	......	......
	31	98·5	83·5	83·5	87·0	87·0	88·0	85·0	85·0	85·3	88·0	*84·0	*87·0
February.	1	75·0	74·0	83·0	87·0	81·0	84·5	*69·0	*82·5	*79·5	*88·2	*86·0	*81·0
	2	92·2	84·0	83·0	84·0	87·0	85·0	88·0	86·0	86·0	86·0	*86·0	*81·5
	3	87·0	85·5	80·5	87·0	86·5	83·0	82·0	*87·0	*89·0	*76·0	*91·0	*83·0
	4	90·0	84·3	84·7	81·0	87·0	85·0	*87·5	*88·5	*82·0	*90·0	*86·0	86·0
	5	95·0	94·0	87·0	81·0	79·0	76·0	84·0	88·0	85·0	*92·0	*91·0	*85·0
	6	......	......	......	......	......	......	......	......	......	......	......	......
	7	85·0	80·0	78·5	78·0	79·5	85·0	82·0	81·0	78·0	*92·0	*99·7	*63·5
	8	81·0	80·0	78·3	81·0	83·0	81·0	81·0	83·0	81·0	79·0	*75·0	*81·0
	9	82·0	79·0	82·0	86·0	87·0	82·0	86·0	82·0	82·5	82·0	81·3	*80·5
	10	86·0	76·0	62·0	68·0	74·0	67·0	71·0	*79·0	*84·0	83·0	*82·0	*82·0
	11	82·0	86·0	80·0	82·0	82·0	80·0	85·0	*79·0	*83·0	*81·0	*84·0	*82·5
	12	81·0	78·0	82·0	83·0	87·0	85·0	83·0	80·0	82·5	84·0	81·0	*82·5
	13	......	......	......	......	......	......	......	......	......	......	......	......
	14	82·0	73·0	76·2	88·0	80·0	88·3	80·0	*67·0	*85·0	*83·0	*108·0	*103·7
	15	89·0	86·0	89·0	86·0	79·0	83·0	84·0	79·5	85·0	81·0	*89·0	*85·0
	16	89·0	81·0	78·0	80·0	76·0	72·0	83·0	70·0	70·0	68·0	65·0	89·0
	17	80·0	87·0	76·0	81·0	86·0	80·0	89·0	80·0	81·2	86·5	81·0	75·0
	18	83·0	72·0	77·0	78·0	81·0	82·0	85·0	85·0	83·0	83·0	82·0	81·0
	19	84·0	84·0	82·0	81·5	82·0	81·0	77·0	80·0	84·0	80·0	*69·5	*62·0
	20	......	......	......	......	......	......	......	......	......	......	......	......
	21	88·0	85·0	74·0	81·0	79·0	77·5	81·0	75·0	76·0	68·0	82·0	77·0
	22	78·0	82·0	76·0	79·0	85·0	89·0	74·0	77·0	76·5	78·0	72·0	41·5
	23	81·5	69·0	73·0	75·0	78·0	76·0	78·0	75·0	79·0	78·0	76·0	83·3
	24	80·0	82·0	85·0	78·0	79·0	70·8	77·0	74·2	*73·0	*79·0	*75·0	*92·0
	25	74·9	78·0	77·0	77·0	78·8	77·6	77·8	81·0	80·9	81·6	81·3	80·0
	26	78·0	78·0	77·0	76·0	82·0	81·0	79·0	82·0	82·0	84·0	85·0	82·5
	27	......	......	......	......	......	......	......	......	......	......	......	......
	28	79·0	83·0	76·0	79·0	71·0	76·0	83·5	84·0	83·0	81·0	*76·0	*109·0

Observations noted with a * were made when the Aurora was visible.

Point Barrow, 1853; Lat. 71° 21′ N. Long. 156° 15′ W. Magnetic Declination.
One Scale-division = 2′·286. Increasing numbers denote increasing Easterly Declination.

12ʰ.	13ʰ.	14ʰ.	15ʰ.	16ʰ.	17ʰ.	18ʰ.	19ʰ.	20ʰ.	21ʰ.	22ʰ.	23ʰ.	Mean Point Barrow Time.	
sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	D.	
*92·3	91·0	......	......	......	......	......	......	......	......	......	......	1	January.
......	*80·0	*83·0	*89·0	*90·0	89·0	84·0	88·0	86·0	87·0	93·0	87·0	2	
*51·0	*94·0	*91·0	*87·0	*90·0	*101·5	99·0	98·0	99·0	104·0	100·0	80·2	3	
*84·0	88·0	*89·0	*91·0	*91·0	*90·0	87·0	88·0	91·5	91·0	93·0	93·0	4	
*102·0	65·0	*99·5	*68·0	*95·0	*110·0	*99·0	*91·0	*100·0	86·0	93 0	92·0	5	
*95·0	*89·0	*93·5	86·0	86·0	84·0	88·0	92·0	84·0	93·0	106·0	90·0	6	
59·0	77·0	101·0	154·0	44·0	93·0	95·0	103·5	102·0	90·3	90·0	90·0	7	
93·0	84·0	......	......	......	......	......	......	......	......	......	......	8	
......	*108·0	*74·0	96·5	97·2	94·5	101·0	101·0	102·0	157·0	112·0	58·5	9	
84·0	*(a)	*102·0	104·0	103·0	102·0	94·0	*97·2	93·0	91·0	86·0	95·0	10	
95·0	*97·0	*96·0	93·5	102·0	94·0	96·3	99·0	102·5	108·0	86·0	90 0	11	
*92·0	89·0	78·0	*90·0	105·0	132·0	109·0	141·0	115·0	80·0	87·5	102·0	12	
*88·0	*97·0	*93·2	*96·0	*90·0	*114·0	*100·0	*85·5	*95·5	96·5	108·5	85·0	13	
*84·0	*72·0	*107·0	*95·0	*96·0	*95·0	*99·0	*97·0	98·0	95·0	97·0	92·0	14	
*90·0	*92·0	......	......	......	......	......	......	......	......	......	......	15	
......	*76·0	*64·0	*86·0	*87·0	*145·0	*99·0	*115·0	*89·0	*39·0	81·0	95·0	16	
*83·3	*85·2	*92·0	*92·0	*93·2	*95·0	*89·0	*99·0	*114·0	*103·0	84·0	82·0	17	
*84·0	*52·5	*102·0	*63·0	84·0	80·0	102·0	98·0	96·2	100·0	97·5	82·0	18	
*82·2	*82·3	*62·0	*71·0	84·0	83·8	84·0	84·7	84·0	84·5	89·9	82·0	19	
*92·0	*90·0	*86·0	*75·0	*104·0	*109·0	*121·0	*78·5	79·0	82·0	86·0	83·5	20	
*83·5	80·0	*94·0	84·0	86·0	88·0	89·0	83·0	84·0	85·0	85·0	82·0	21	
81·1	82·0	......	......	......	......	......	......	......	......	......	......	22	
......	75·0	82·0	82·5	84·0	86·0	92·0	87·0	89·0	88·0	89·0	81·0	23	
81·0	*89·0	*91·0	*96·0	*88·0	*94·0	*95·0	95·0	83·5	89·0	82·0	75·0	24	
82·5	83·0	84·0	84·2	84·0	86·0	87·5	85·0	84·0	82·5	86·0	82·0	25	
80·0	*73·5	85·0	84·0	83·0	84·0	89·0	85·0	85·0	81·0	82·0	84·0	26	
*72·0	*88·0	*78·5	*103·0	*108·5	94·0	93·0	88·0	92·0	88·0	85·0	82·5	27	
*83·0	*82·0	*85·0	*80·0	*84·0	*86·0	*89·0	*87·0	87·0	94·0	85·0	86·0	28	
69·0	82·0	......	......	......	......	......	......	......	......	......	.....	29	
......	87·0	87·0	*91·0	*88·0	107·0	91·0	99·0	88·2	87·0	92·0	95·0	30	
*86·0	86·0	112·0	89·0	106·5	89·0	90·0	95·0	90·0	89·5	92·0	89·0	31	
*73·5	*88·0	*73·0	*92·0	*86·0	88·0	127·0	95·0	87·0	79·0	80·0	84·0	1	February.
*72·0	*94·0	*98·2	*97·5	94·0	96·0	93·0	90 0	86·0	88·0	86·0	91·0	2	
*94·0	*88·0	*88·0	*116·0	*141·0	*95·0	*95·0	113·0	104·0	94·5	96·0	83·0	3	
86·5	83·0	79·0	76·5	88·0	87·0	95·0	105·0	102·0	130 0	72·0	82·0	4	
*85·0	*63·0	......	......	......	......	......	......	......	......	......	......	5	
......	*88·0	*86·0	*92·0	*89·0	*95·0	*93·0	99·0	89·0	88·0	87·5	86·0	6	
73·0	90·0	*83·0	*81·5	*95·0	*87·0	82·0	88·0	106·0	80·0	83·0	84·0	7	
*65·0	*72·0	*69·0	*66·5	*60·0	*83·0	*85·0	87·0	85·0	86·0	82·0	81·0	8	
*105·0	*86·0	*82·0	*85·0	*84·0	*87·0	*75·0	81·0	80·0	95·0	92·0	89·0	9	
*81·0	*80·0	*86·0	*78·0	*89·0	*91·0	*88·0	*96·0	78·0	83·0	85·0	80·0	10	
*72·5	83·0	*78·0	*87·0	*96·0	*98·0	*91·0	84·0	85·0	89·0	87·0	85·0	11	
*86·0	*84·0	......	......	......	......	......	......	......	......	......	......	12	
......	*74·0	*110·0	*81·0	85·0	*67·5	*68·0	*126·0	90·0	93·0	104·0	59·0	13	
*80·0	*94·0	*78·0	*86·0	84·0	86·0	89·0	87·0	85·5	86·5	85·0	81·0	14	
*87·0	88·0	83·0	*73·5	97·0	90·0	95·0	102·0	115·0	102·0	86 0	87·0	15	
81·0	94·0	103·0	114·5	99·0	96·0	97·0	93·0	102·0	111·0	115·0	83·0	16	
86·0	85·0	*89·0	*86·0	83·0	88·5	79·0	73·0	91·0	83·0	80·0	82·0	17	
85·0	78·0	*85·0	*92·0	*94·0	93·0	85·0	87·0	83·0	81·0	86·0	80·0	18	
*65·0	*78·5	......	......	......	......	......	......	......	......	......	......	19	
......	99·5	*114·0	*84·0	87·2	91·0	98·0	102·0	108·0	69·5	98·0	100·0	20	
75·0	86·0	82·0	81·0	95·0	98·7	91·0	96·0	94·0	102·0	104·0	98·0	21	
103·5	70·0	74·0	86·0	92·0	95·0	88·0	89·0	76·0	75·0	73·0	74·5	22	
80·0	78·0	83·0	79·0	78·5	79·0	84·0	78·0	80·0	74·0	78·0	78·0	23	
78·0	82·0	*76·0	*64·0	*67·0	*96·0	93·0	88·0	95·0	96·2	84·0	84·0	24	
80·2	*80·0	*84·0	*80·0	*91·0	90·0	82·0	84·5	94·1	100·8	78·0	78·0	25	
83·0	82·0	......	......	......	......	......	......	......	......	......	......	26	
......	104·0	91·0	93·0	96·0	92·0	96·0	110·0	100·0	105·0	85·0	85·0	27	
*89·0	*89·0	*89·0	*87·0	85·0	102·0	94·0	92·0	92·0	70·0	86·0	75·0	28	

(*a*) Off Scale East.

Point Barrow, 1853; Lat. 71° 21′ N. Long. 156° 15′ W. Magnetic Declination.
One Scale-division $=2'{\cdot}286$. Increasing numbers denote increasing Easterly Declination.

Mean Point Barrow Time.		0h.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	8h.	9h.	10h.	11h.
	D.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.
March.	1	83·0	79·0	82·5	80·0	78·0	83·0	81·5	88·0	*82·0	*80·0	*70·5	*80·2
	2	80·0	82·0	76·2	81·0	80·0	82·0	84·0	83·0	82·5	83·0	75·0	73·0
	3	82·0	80·0	78·0	82·0	82·0	82·2	79·0	84·0	81·0	82·0	82·0	85·0
	4	89·0	84·0	71·5	81·5	80·0	82·5	84·2	84·0	77·0	81·0	*82·0	*84·0
	5	77·0	82·0	78·0	81·0	83·0	81·0	82·0	85·0	83·0	*82·0	*81·0	*84·0
	6	......	......	......	......	......	......	......	......	......	......	......	......
	7	54·0	62·0	87·0	83·0	75·0	82·0	80·0	86·0	52·5	92·5	72·5	72·0
	8	62·0	53·0	97·5	80·0	90·0	83·0	79·0	71·5	*88·2	*89·0	*76·0	*23·0
	9	75·0	73·0	85·3	88·0	70·0	88·0	82·0	79·2	74·0	94·0	95·0	69·0
	10	76·0	79·0	66·0	77·0	68·0	84·0	79·0	88·5	73·0	*74·5	*75·0	*75·0
	11	109·0	63·0	71·0	72·0	83·0	79·0	85·0	123·0	*80·0	*110·0	*69·5	*72·0
	12	89·0	62·5	71·5	79·2	46·5	76·0	72·5	67·2	87·0	*95·5	*94·0	*97·0
	13	......	......	......	......	......	......	......	......	......	......	......	......
	14	88·0	86·0	79·5	84·2	80·0	89·0	78·0	85·0	83·3	84·5	*89·0	*86·5
	15	77·7	83·0	70·3	80·0	83·0	84·0	76·0	87·5	84·0	82·0	83·5	82·0
	16	95·5	85·5	88·5	83·0	78·0	89·0	85·5	88·5	102·5	86·5	106·0	84·5
	17	89·0	73·5	80·0	85·0	78·5	81·2	82·5	90·5	76·5	*83·0	*80·7	*76·0
	18	75·0	78·0	83·2	83·5	94·0	81·0	86·0	78·5	83·5	83·5	86·0	84·5
	19	91·0	105·0	85·0	87·0	84·0	83·5	76·5	81·5	*87·3	85·5	88·7	86·0
	20	......	......	......	......	......	......	......	......	......	......	......	......
	21	85·0	82·0	84·0	83·0	81·0	105·0	93·5	85·0	82·7	84·3	84·0	84·0
	22	82·0	97·0	97·0	85·0	87·0	83·0	85·0	86·0	84·0	85·0	96·0	96·0
	23	86·2	79·5	82·4	80·7	79·9	82·0	81·3	76·5	79·3	77·3	*68·5	*68·5
	24	83·5	78·5	81·0	79·0	84·0	82·0	91·0	94·0	78·5	84·0	79·0	79·5
	25	83·0	84·0	80·5	75·0	83·0	85·0	85·0	84·0	86·0	86·2	82·0	78·2
	26	82·0	78·7	86·0	83·0	84·5	84·0	85·5	84·5	78·0	75·3	*64·5	*102·5
	27	......	......	......	......	......	......	......	......	......	......	......	......
	28	83·0	86·0	84·0	85·0	81·0	85·3	80·0	82·0	80·5	89·2	89·0	*85·0
	29	87·0	76·5	85·0	84·7	81·5	83·0	82·5	87·5	84·0	83·8	78·0	*97·0
	30	71·7	93·0	86·0	84·5	81·5	82·0	85·0	85·0	83·7	92·0	*81·5	*85·0
	31	82·0	89·0	88·0	86·0	83·0	85·0	85·0	85·5	88·5	95·0	94·0	*103·0
April.	1	83·0	86·0	90·0	82·7	85·0	77·0	77·5	77·0	82·0	147·5	*56·0	*60·5
	2	87·0	84·0	88·0	83·5	84·0	84·0	84·0	86·7	86·0	86·5	86·0	89·0
	3	......	......	......	......	......	......	......	......	......	......	......	......
	4	86·0	83·0	83·5	82·0	82·0	83·5	83·0	85·0	75·0	45·0	*79·0	*76·0
	5	143·0	73·5	81·5	74·0	76·2	83·0	86·0	61·0	64·0	92·0	*63·0	*44·0
	6	82·0	80·0	75·0	84·0	77·0	82·0	81·0	84·5	85·5	77·5	94·0	*76·0
	7	81·0	81·2	79·0	81·0	91·0	84·5	84·0	86·0	82·0	75·0	78·5	84·5
	8	70·0	89·0	74·5	84·5	72·5	79·0	84·0	65·0	68·0	69·0	80·5	*92·7
	9	74·0	95·5	83·5	76·5	76·2	84·0	70·5	80·0	78·0	81·0	*104·0	*96·0
	10	......	......	......	......	......	......	......	......	......	......	......	......
	11	89·0	80·0	78·0	81·0	81·2	81·2	86·0	85·0	93·0	68·0	32·5	74·5
	12	95·0	93·0	76·0	78·0	85·5	82·0	85·0	85·0	86·0	82·5	80·0	86·7
	13	85·0	86·0	85·5	87·0	85·0	85·0	84·5	85·0	86·0	86·0	84·0	87·0
	14	90·0	85·0	79·0	81·0	83·0	84·5	87·0	84·0	80·5	81·5	72·0	76·0
	15	88·5	86·0	83·3	88·0	96·0	83·0	79·0	82·5	86·8	90·0	87·5	86·0
	16	96·7	76·0	82·5	82·0	86·5	84·0	87·0	85·0	86·0	88·7	83·7	76·5
	17	......	......	......	......	......	......	......	......	......	......	......	......
	18	87·0	91·0	78·0	80·0	83·0	79·0	87·0	80·5	84·0	82·0	84·2	88·0
	19	85·0	79·0	78·5	82·0	119·0	82·0	87·0	81·0	80·0	79·5	81·5	85·0
	20	94·0	88·2	74·5	76·8	77·8	80·8	77·0	......	......	83·0	83·0	84·5
	21	85·0	87·0	84·7	79·0	81·0	80·0	81·0	84·0	87·0	87·0	80·0	76·0
	22	76·0	75·0	75·0	84·0	86·0	85·7	70·0	87·0	56·5	64·0	67·5	36·0
	23	86·5	89·0	84·0	85·0	85·0	82·0	80·0	84·0	88·5	84·0	81·5	78·5
	24	......	......	......	......	......	......	......	......	......	......	......	......
	25	91·0	91·4	83·0	78·0	76·5	76·0	85·2	81·0	84·5	83·0	83·0	83·0
	26	97·0	95·0	88·0	86·0	81·0	87·0	87·0	89·0	88·0	92·5	88·2	89·0
	27	91·0	92·0	84·0	88·0	88·0	89·0	87·0	87·0	88·3	87·5	90·5	91·5
	28	91·0	91·0	88·0	86·0	88·0	86·0	85·0	89·0	87·0	76·0	73·0	91·2
	29	92·0	85·0	91·0	89·0	94·0	88·5	75·0	84·0	84·0	95·0	89·0	82·0
	30	98·0	88·0	93·0	86·0	84·0	83·0	90·0	85·0	86·0	90·0	82·0	89·0

Observations noted with a * were made when the Aurora was visible.

Point Barrow, 1853; Lat. 71° 21′ N. Long. 156° 15′ W. Magnetic Declination.
One Scale-division =2′·286. Increasing numbers denote increasing Easterly Declination.

12h.	13h.	14h.	15h.	16h.	17h.	18h.	19h.	20h.	21h.	22h.	23h.	Mean Point Barrow Time.	
sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	D.	Month
*92·0	*95·0	*77·0	*89·0	*86·0	90·0	90·0	89·0	94·0	82·0	88·3	82·0	1	March.
74·5	78·0	84·0	86·0	89·0	109·0	78·0	87·0	85·0	97·0	80·0	83·0	2	March.
83·0	84·0	81·0	86·5	107·5	96·0	90·0	86·0	86·2	86·0	91·0	72·0	3	March.
*81·0	84·0	92·0	87·5	88·0	98·0	98·0	98·0	96·0	82·0	91·0	76·0	4	March.
*88·0	*78·0	......	......	......	......	......	......	......	......	......	......	5	March.
......	*127·6	*82·5	*87·0	*104·5	99·0	85·0	104·0	(a)	(a)	(a)	138·0	6	March.
121·0	73·0	16·0	43·0	64·0	(b)	82·0	146·0	120·5	113·5	111·0	122·0	7	March.
*130·0	*85·0	*117·0	*35·3	99·0	105·0	101·5	116·0	103·0	78·0	78·0	76·0	8	March.
*54·0	*59·0	*88·0	*92·0	*96·0	90·0	94·0	110·0	94·0	93·0	128·0	95·0	9	March.
83·5	*80·0	*94·0	*93·0	106·0	120·0	110·0	98·0	124·0	92·0	142·0	110·5	10	March.
*71·5	*103·0	*75·0	*91·0	101·5	86·0	94·0	102·0	120·0	72·5	106·0	103·0	11	March.
*77·0	*65·0	......	......	......	......	......	......	......	......	......	......	12	March.
......	*115·0	*75·0	*100·0	*85·5	89·0	90·0	92·5	88·0	89·0	86·0	88·0	13	March.
*82·0	*75·0	*82·0	*74·0	*76·0	93·5	90·0	102·3	93·0	97·0	92·5	92·3	14	March.
85·0	78·0	*59·0	*80·0	*97·5	86·0	91·0	95·0	94·0	95·0	96·5	82·0	15	March.
85·0	84·0	88·0	84·0	76·0	84·0	85·0	93·0	96·0	90·0	95·0	67·0	16	March.
*70·5	*69·0	*119·0	*103·0	91·0	88·0	84·0	110·0	81·0	78·5	76·5	84·0	17	March.
83·0	99·5	84·0	97·0	87·5	86·5	75·5	94·0	88·5	94·0	84·0	85·0	18	March.
102·5	82·2	......	......	......	......	......	......	......	......	......	......	19	March.
......	94·0	88·0	*89·5	95·0	105·0	95·0	93·5	88·0	90·0	84·0	84·5	20	March.
87·0	91·5	94·5	107·0	78·0	85·0	90·5	89·0	95·0	88·0	81·0	83·0	21	March.
103·5	81·0	*90·5	87·0	94·0	86·0	84·0	86·0	90·0	91·0	84·0	78·0	22	March.
72·5	74·2	83·2	90·1	102·3	100·0	83·1	88·0	85·5	87·0	84·2	86·5	23	March.
81·0	81·0	85·0	82·2	77·0	102·5	97·5	110·5	111·5	120·0	103·0	103·0	24	March.
84·0	91·7	92·0	87·2	87·0	89·0	88·0	96·0	124·5	99·0	80·0	84·0	25	March.
*97·5	86·0	......	......	......	......	......	......	......	......	......	......	26	March.
......	*58·5	*85·0	*88·2	125·0	115·0	100·0	95·5	103·0	115·0	77·0	79·0	27	March.
84·1	88·7	87·0	86·0	85·7	147·0	85·5	88·0	88·0	92·0	89·0	87·0	28	March.
*84·0	*91·0	*103·5	71·0	104·5	85·0	94·0	115·0	106·0	83·8	96·5	75·5	29	March.
*87·0	*127·5	*133·0	84·0	96·0	83·0	83·2	106·3	76·0	78·0	85·0	82·5	30	March.
85·0	*111·5	90·0	110·5	91·5	86·5	85·0	80·5	95·0	87·0	88·0	83·0	31	March.
101·3	87·3	*93·0	88·5	90·0	90·0	86·0	87·5	94·0	89·0	90·0	87·6	1	April.
*84·0	*86·0	......	......	......	......	......	......	......	......	......	......	2	April.
......	......	92·0	92·0	83·0	87·0	92·0	84·0	86·0	89·0	90·7	87·0	3	April.
*85·5	*81·0	96·0	104·5	87·5	90·2	98·0	97·0	98·0	(a)	150·0	112·0	4	April.
*75·0	*91·7	116·5	85·5	89·2	92·5	21·5	25·5	98·0	135·0	102·0	107·0	5	April.
*104·0	*94·0	96·0	91·0	95·0	102·5	93·0	97·0	117·5	98·5	113·0	75·0	6	April.
33·0	75·0	86·0	95·0	106·0	96·0	115·0	100·0	108·0	80·5	120·7	97·0	7	April.
65·0	*124·0	75·5	78·0	81·0	117·0	112·5	84·0	96·0	135·0	94·0	67·0	8	April.
80·0	50·2	......	......	......	......	......	......	......	......	......	......	9	April.
......	151·0	102·0	89·0	90·0	99·7	87·0	91·0	129·5	91·0	96·2	94·0	10	April.
85·0	*90·5	88·0	85·5	97·0	81·0	91·0	99·0	87·0	113·0	84·0	98·5	11	April.
*89·6	*90·5	94·0	81·5	97·5	106·0	108·0	97·5	115·0	105·0	91·0	83·0	12	April.
87·5	81·0	82·0	83·5	91·0	98·0	96·0	115·0	109·0	102·0	97·0	94·0	13	April.
82·0	75·0	84·0	76·0	91·0	89·7	87·0	79·0	95·5	92·5	89·5	88·0	14	April.
86·0	89·0	92·0	90·0	96·0	93·0	96·0	89·0	92·0	82·3	95·0	92·3	15	April.
82·0	78·5	......	......	......	......	......	......	......	......	......	......	16	April.
......	87·0	97·5	94·0	85·5	92·0	92·6	96·0	99·0	(c)	......	95·0	17	April.
85·0	82·0	84·5	85·0	97·0	97·7	92·3	114·0	118·0	86·0	125·0	91·0	18	April.
89·0	90·0	98·0	92·5	98·0	94·0	104·0	98·0	101·0	113·0	108·0	112·0	19	April.
70·5	83·0	80·2	89·2	97·2	90·0	92·0	97·5	96·8	93·8	92·7	84·0	20	April.
84·0	83·0	81·0	87·0	92·0	91·0	107·5	105·0	112·0	95·0	92·0	100·4	21	April.
80·0	83·0	91·0	92·0	87·0	102·0	97·0	94·0	122·0	118·5	105·5	74·5	22	April.
67·3	82·0	......	......	......	......	......	......	......	......	......	......	23	April.
......	86·5	87·0	89·0	89·5	91·0	108·0	95·5	90·0	94·0	92·0	96·0	24	April.
82·0	86·0	77·5	70·0	79·5	82·0	82·5	82·0	83·0	82·0	93·2	95·0	25	April.
91·0	91·0	89·0	86·0	85·0	102·0	100·5	96·7	93·0	92·0	91·0	90·0	26	April.
90·0	88·0	89·0	93·0	95·0	95·0	93·0	91·0	94·0	92·0	91·0	91·5	27	April.
91·5	86·0	91·0	91·0	92·5	105·0	95·2	97·0	94·0	91·0	92·0	96·0	28	April.
81·0	85·0	89·3	101·0	98·0	93·0	94·0	106·0	102·0	99·0	92·0	98·0	29	April.
75·0	87·0	......	......	......	......	......	......	......	......	......	......	30	April.

(a) Off Scale East. (b) Off Scale West. (c) Instrument removed.

Point Barrow, 1853; Lat. 71° 21′ N. Long. 156° 15′ W. Magnetic Declination.
One Scale-division =2′·286. Increasing numbers denote increasing Easterly Declination.

Mean Point Barrow Time.		0h.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	8h.	9h.	10h.	11h.
	D.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.
May.	1	......	......	......	......	......	......	......	......	......	......	......	......
	2	100·0	93·0	95·0	98·0	81·3	75·0	70·0	121·0	68·0	75·5	94·5	51·0
	3	100·0	95·0	96·5	115·0	121·0	75·9	75·0	98·0	94·0	93·0	79·0	82·0
	4	91·0	112·0	87·0	87·0	89·0	80·5	83·0	101·0	72·0	132·0	92·0	75·0
	5	91·0	96·0	94·0	89·0	94·0	87·0	80·0	84·0	85·3	94·5	85·0	71·0
	6	97·0	88·0	100·0	116·0	91·0	94·0	93·0	89·0	85·0	86·0	81·3	98·0
	7	96·0	111·0	96·0	84·0	79·0	95·2	90·0	84·0	87·0	83·0	99·0	90·0
	8	......	......	......	......	......	......	......	......	......	......	......	......
	9	96·0	90·0	94·0	88·0	95·0	85·0	85·0	87·0	86·0	93·0	87·0	89·5
	10	89·0	87·0	82·0	86·5	87·0	80·0	86·0	89·0	90·0	90·3	90·3	89·3
	11	87·0	86·0	81·0	83·0	84·0	87·0	86·0	88·0	89·2	89·0	86·0	84·0
	12	83·0	84·0	83·0	84·0	86·0	87·0	87·7	86·0	89·0	89·0	87·0	85·0
	13	86·0	87·0	85·0	87·0	85·2	88·0	87·0	87·0	89·0	88·2	88·2	88·5
	14	93·0	86·0	88·0	89·0	90·0	97·5	85·0	85·0	89·0	87·0	88·0	88·7
	15	......	......	......	......	......	......	......	......	......	......	......	......
	16	87·0	87·0	88·0	87·0	84·0	82·0	78·0	76·0	79·0	88·2	89·0	88·0
	17	74·5	87·0	87·0	86·0	82·0	79·5	78·0	76·0	78·0	83·0	93·5	89·5
	18	84·0	91·0	88·2	81·0	83·0	85·0	89·0	88·0	91·0	88·0	87·5	90·0
	19	72·0	72·0	82·0	84·7	82·0	86·5	86·0	80·0	95·0	86·0	85·0	89·0
	20	89·0	84·0	87·0	91·0	89·0	87·0	84·0	88·0	89·0	90·0	87·2	89·0
	21	90·0	86·0	82·0	85·6	80·0	86·0	89·0	87·0	89·0	87·2	89·0	87·2
	22	......	......	......	......	......	......	......	......	......	......	......	......
	23	104·0	111·0	69·0	81·0	85·0	84·0	82·0	85·0	87·0	87·0	86·0	85·0
	24	89·0	92·0	89·0	94·0	92·0	91·0	96·0	84·0	88·0	86·0	65·0	78·0
	25	74·0	87·2	94·2	81·5	87·0	86·0	87·0	85·7	86·0	84·0	89·0	86·0
	26	89·7	87·0	83·0	88·5	91·0	86·0	89·0	89·0	91·0	90·0	89·0	87·0
	27	87·9	88·0	91·0	87·5	92·0	84·7	83·3	72·0	81·3	57·5	64·2	87·4
	28	104·0	89·0	84·0	86·0	78·0	79·5	85·0	90·2	85·1	91·0	86·5	96·0
	29	......	......	......	......	......	......	......	......	......	......	......	......
	30	102·0	102·0	98·0	96·0	82·0	84·0	76·0	71·0	76·0	78·5	82·5	77·3
	31	79·0	84·5	93·7	88·0	88·5	83·0	77·2	84·0	89·0	85·0	79·0	73·0
June.	1	(a)				92·0	85·0	44·7	44·5	58·0	70·0	56·0	52·0
	2	89·0	73·0	69·0	74·0	82·0	74·0	73·0	84·0	76·5	82·5	81·0	81·2
	3	90·0	86·2	71·2	76·0	72·0	75·0	75·0	77·0	83·0	82·0	72·5	78·0
	4	84·0	70·0	79·0	76·0	74·0	67·0	83·2	81·0	72·0	85·0	82·0	81·0
	5	......	......	......	......	......	......	......	......	......	......	......	......
	6	72·0	76·0	80·0	76·0	70·0	66·0	73·0	38·0	65·0	63·2	71·0	82·0
	7	87·0	69·3	79·2	78·0	75·0	77·2	78·0	78·0	79·0	79·0	75·0	74·0
	8	77·0	73·3	76·0	85·0	74·0	77·0	78·0	76·0	78·0	78·0	78·0	77·0
	9	89·0	91·0	83·0	80·0	79·0	69·7	71·0	69·5	57·0	57·0	79·5	84·0
	10	75·2	77·0	76·5	75·0	75·0	75·0	76·0	77·0	72·0	78·0	78·0	74·0
	11	78·0	73·0	71·0	74·0	74·0	71·0	71·0	81·5	70·0	79·0	71·0	58·0
	12	......	......	......	......	......	......	......	......	......	......	......	......
	13	67·2	69·0	78·0	80·0	85·0	71·0	75·0	78·0	76·0	81·5	76·0	67·0
	14	85·0	44·3	65·5	80·0	64·0	73·0	73·0	63·0	76·5	78·0	60·5	44·2
	15	103·0	54·0	161·0	64·4	78·0	77·5	77·5	72·0	73·0	71·0	78·0	71·3
	16	85·0	77·0	71·0	73·0	78·5	74·0	74·0	75·0	76·0	76·0	77·0	73·0
	17	79·5	85·0	84·2	78·0	75·0	74·0	74·0	81·0	85·0	75·0	74·5	77·2
	18	82·0	76·0	72·0	74·0	75·0	79·0	79·0	77·0	78·0	74·0	78·0	73·0
	19	......	......	......	......	......	......	......	......	......	......	......	......
	20	55·0	75·0	73·0	75·0	71·0	76·0	76·0	75·0	78·0	74·0	69·0	57·0
	21	81·0	76·0	71·0	69·0	75·0	69·0	74·0	78·0	78·0	74·0	75·0	73·0
	22	14·0	73·5	98·0	94·3	66·0	63·3	75·0	73·2	77·2	64·8	64·3	83·7
	23												
	24												
	25												
	26												
	27												
	28												
	29												
	30												

(a) Unroofing Observatory.

Point Barrow, 1853; Lat. 71° 21′ N. Long. 156° 15′ W. Magnetic Declination.
One Scale-division = 2′·286. Increasing numbers denote increasing Easterly Declination.

12h.	13h.	14h.	15h.	16h.	17h.	18h.	19h.	20h.	21h.	22h.	23h.	Mean Point Barrow Time.	
sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	D.	
......	101·0	85·0	76·0	100·0	105·0	99·0	101·0	109·0	98·5	125·0	106·0	1	
104·0	72·0	62·0	86·0	106·0	120·0	128·0	146·0	(b)	(b)	105·0	101·0	2	
68·5	68·5	80·0	79·0	92·0	122·5	91·0	95·5	121·0	99·0	94·0	92·0	3	
78·0	82·0	116·0	95·0	98·0	102·0	90·6	89·5	99·5	89·0	92·0	92·0	4	
62·0	96·0	97·0	97·0	99·0	93·0	111·0	107·0	105·0	103·0	93·7	94·0	5	
89·0	104·0	131·0	122·0	113·5	98·0	104·0	125·0	95·5	104·0	81·0	93·0	6	
78·0	99·3	......	......	......	......	......	......	......	......	......	......	7	
......	85·0	89·0	91·0	93·0	104·0	101·0	103·0	102·0	102·5	107·0	94·0	8	
88·5	86·0	89·0	91·5	98·0	95·0	94·0	99·0	96·5	94·3	92·0	92·0	9	
89·7	84·5	88·0	87·0	88·0	97·5	95·5	87·5	96·0	95·0	92·0	86·0	10	
88·0	84·0	81·0	90·0	89·0	89·0	95·0	94·0	95·0	91·2	89·0	96·0	11	
88·0	85·0	91·0	85·0	97·0	96·0	101·0	103·7	94·0	98·0	100·0	93·0	12	
89·0	87·0	91·0	92·0	96·0	94·0	95·0	100·0	96·0	89·0	90·0	97·0	13	
90·0	81·0	......	......	......	......	......	......	......	......	......	......	14	
......	87·2	95·2	94·0	97·5	96·0	96·0	96·5	93·0	96·0	98·0	86·2	15	
87·0	87·0	93·0	92·0	90·0	94·0	91·0	105·0	103·0	89·0	94·5	104·0	16	May.
91·0	89·0	86·0	88·0	86·0	89·0	107·0	110·0	129·0	105·0	107·0	97·7	17	
85·0	83·0	102·0	96·0	27·0	72·0	116·0	112·0	126·0	96·0	80·0	73·0	18	
73·0	81·0	84·0	92·0	96·0	98·0	100·0	102·0	103·0	103·0	95·0	92·0	19	
88·5	82·0	87·0	86·0	89·0	87·0	110·0	114·0	113·0	98·0	91·0	88·0	20	
86·5	86·0	......	......	......	......	......	......	......	......	......	......	21	
......	86·0	85·2	93·5	82·0	99·0	93·0	96·0	115·0	99·0	98·0	106·0	22	
83·0	87·0	86·0	85·0	83·0	76·0	79·5	89·0	98·0	92·0	130·0	87·0	23	
96·0	97·0	91·0	99·0	94·0	95·0	98·0	100·0	125·0	92·0	92·5	81·0	24	
85·2	81·0	84·0	87·0	92·0	96·0	98·0	102·0	101·0	104·0	96·0	91·0	25	
81·3	94·5	92·0	93·5	93·0	88·0	94·0	99·0	99·0	101·0	93·0	87·0	26	
79·8	92·5	86·8	97·5	69·0	103·0	100·0	123·3	118·0	145·0	65·7	104·0	27	
78·2	......	......	......	......	......	......	......	......	......	......	......	28	
......	94·0	102·0	93·0	94·0	91·0	104·0	145·0	114·0	103·0	114·0	100·3	29	
79·0	88·1	77·5	99·0	102·0	98·0	96·5	105·0	105·0	129·0	107·0	85·0	30	
78·0	81·0	86·5	82·3	82·0	88·0	101·3	(b)	103·5	157·8	(a)	......	31	
46·0	55·0	83·0	72·0	85·3	94·7	37·3	46·0	45·5	103·6	104·6	101·2	1	
62·0	91·0	78·0	70·0	79·0	86·0	99·0	106·0	97·0	93·0	88·3	69·7	2	
84·0	79·0	76·2	82·0	94·0	86·0	98·0	94·0	100·1	85·0	87·0	83·0	3	
80·0	78·0	......	......	......	......	......	......	......	......	......	......	4	
......	65·0	65·0	79·0	87·0	92·0	95·0	97·0	99·3	96·0	85·0	74·0	5	
75·0	78·0	82·0	86·0	80·0	84·0	89·0	105·0	106·0	118·0	100·0	98·0	6	
78·0	76·0	68·5	79·0	83·0	85·0	94·0	91·0	90·0	87·0	83·0	77·0	7	
75·0	69·0	82·0	80·0	84·0	83·0	86·0	94·0	87·2	89·0	84·0	83·0	8	
79·5	79·0	80·0	80·0	88·0	84·0	85·0	89·0	87·0	81·5	81·0	83·0	9	
75·6	69·0	74·0	64·0	78·0	89·0	92·0	95·0	98·0	99·0	91·0	73·0	10	
60·0	102·0	......	......	......	......	......	......	......	......	......	......	11	
......	83·0	79·0	81·0	86·0	106·0	105·0	96·5	102·7	79·5	96·5	69·0	12	
24·3	45·0	62·0	64·0	78·0	67·0	69·0	85·0	110·0	80·5	83·0	86·0	13	
58·0	72·3	79·0	84·0	81·0	94·0	89·0	80·0	81·5	98·0	114·0	120·0	14	
74·0	78·0	67·0	81·0	82·0	86·3	85·0	106·0	94·3	91·0	81·0	94·0	15	
71·0	72·3	84·0	91·0	89·0	85·0	89·0	91·0	89·0	96·0	83·0	82·0	16	June.
78·0	78·0	79·0	83·0	85·0	93·0	89·0	89·5	91·0	88·0	89·0	83·0	17	
75·0	74·0	......	......	......	......	......	......	......	......	......	......	18	
......	69·0	80·0	79·0	86·0	92·0	101·0	94·0	103·0	112·0	87·0	87·0	19	
72·0	71·0	70·0	78·0	84·0	110·0	116·0	98·0	80·5	82·0	82·0	80·0	20	
72·0	78·5	79·0	74·0	80·0	89·0	98·0	101·0	94·0	132·0	111·0	(b)	21	
76·8	......	......	......	......	......	......	......	......	......	......	......	22	
												23	
												24	
												25	
												26	
												27	
												28	
												29	
												30	

(a) Unroofing Observatory. (b) Off Scale East.

Point Barrow, 1853; Lat. 71° 21′ N. Long. 156° 15′ W. Magnetic Declination.
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Month	Mean Point Barrow Time.	0h.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	8h.	9h.	10h.	11h.
	D.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.
October.	1												
	2												
	3												
	4												
	5												
	6												
	7												
	8												
	9												
	10												
	11	......	......	......	......	......	......	......	......	......	......	......	......
	12	84·5	82·4	79·8	79·5	77·5	75·0	78·3	78·7	82·5	79·3	80·5	80·7
	13	78·5	79·7	80·0	84·3	80·3	81·0	81·5	76·9	80·7	80·5	78·0	70·0
	14	70·0	69·5	81·5	76·0	78·5	75·0	77·3	73·8	80·0	79·3	79·0	79·3
	15	76·2	75·0	72·5	75·0	79·7	77·0	71·0	79·3	85·7	78·5	71·8	81·0
	16	......	......	......	......	......	......	......	......	......	......	......	......
	17	74·5	78·5	73·4	80·5	75·0	79·7	83·9	72·5	76·0	77·5	75·5	68·5
	18	75·3	73·0	74·0	71·3	77·5	79·3	79·7	79·7	82·0	83·3	79·5	76·7
	19	77·7	75·6	78·0	77·8	77·8	73·0	73·5	77·1	77·3	78·5	*73·0	73·4
	20	74·7	71·6	76·6	77·0	77·0	75·3	74·4	72·2	76·0	82·5	80·4	77·3
	21	76·7	78·6	78·3	78·9	78·9	76·5	78·5	80·0	78·7	76·5	*78·0	*76·7
	22	78·7	79·0	78·5	79·2	79·0	75·3	78·0	79·9	78·3	77·5	*79·3	*46·0
	23	......	......	......	......	......	......	......	......	......	......	......	......
	24	81·5	78·0	80·0	80·0	75·0	71·7	*73·5	*73·0	*73·3	*74·0	*79·3	*38·5
	25	67·0	75·7	77·3	75·5	73·7	77·5	76·8	78·3	78·0	*63·0	*68·5	*72·5
	26	78·0	79·0	80·5	77·5	79·0	78·7	78·1	79·5	82·2	79·4	77·7	*157·7
	27	74·5	76·8	77·0	79·8	76·5	79·0	84·0	82·9	76·5	80·0	*83·3	*83·2
	28	79·8	79·5	79·7	79·5	81·0	81·3	79·3	82·0	81·5	81·3	81·3	*81·0
	29	81·0	79·5	80·3	79·7	78·5	77·5	80·5	79·0	82·5	82·0	84·0	83·5
	30	......	......	......	......	......	......	......	......	......	......	......	......
	31	38·5	61·2	77·7	84·0	78·7	79·7	84·0	80·8	81·1	80·7	78·5	80·0
November.	1	73·4	77·8	77·5	82·2	81·5	80·3	82·1	82·5	83·0	81·7	82·5	*80·0
	2	72·7	80·6	81·8	79·0	81·1	79·3	75·7	82·3	*82·0	*80·3	*80·5	*90·7
	3	78·6	80·0	79·5	81·0	81·5	81·1	80·8	81·0	81·5	79·7	81·7	*79·3
	4	77·4	78·3	78·3	76·0	79·0	78·3	77·5	79·0	78·0	79·5	78·5	79·3
	5	77·3	82·9	72·0	78·7	78·1	79·3	80·3	79·5	78·0	*78·7	*78·5	78·7
	6	......	......	......	......	......	......	......	......	......	......	......	......
	7	77·5	77·0	77·5	79·5	79·0	78·7	79·5	81·0	*79·0	*77·0	*63·3	*67·3
	8	93·0	75·0	74·0	79·3	75·9	80·5	80·5	79·7	79·6	79·5	*78·3	*67·5
	9	51·3	72·0	75·0	75·5	78·5	82·9	65·5	*83·5	*68·5	*68·6	*62·1	*90·0
	10	77·0	75·0	79·0	77·0	79·0	74·1	*77·2	*75·3	*85·0	*76·0	*80·0	*(a)
	11	79·3	80·0	77·5	79·7	72·5	82·5	*75·5	80·4	84·3	80·7	79·5	*78·4
	12	78·0	83·5	83·0	77·0	84·0	80·0	85·0	82·5	81·8	78·8	80·2	80·3
	13	......	......	......	......	......	......	......	......	......	......	......	......
	14	80·0	80·5	79·7	80·5	80·0	81·5	80·9	79·1	80·4	76·5	88·0	78·0
	15	81·5	80·5	76·5	80·5	81·5	80·5	81·8	80·3	80·0	*80·4	*73·2	92·0
	16	76·5	74·5	75·3	82·0	82·7	80·5	82·0	79·0	*73·3	*83·7	*155·0	*61·0
	17	87·7	82·1	79·3	80·9	80·0	82·5	80·7	80·5	80·0	65·5	85·0	79·7
	18	79·0	79·0	78·8	77·6	79·5	80·7	79·0	*76·3	77·7	*77·5	*83·5	*98·5
	19	70·7	81·0	78·0	79·0	79·0	80·4	84·0	80·7	78·0	79·5	76·8	94·6
	20	......	......	......	......	......	......	......	......	......	......	......	......
	21	80·3	80·1	79·2	84·0	81·7	77·9	81·7	77·5	*79·5	84·1	85·5	83·5
	22	79·0	82·7	72·5	78·8	81·5	81·5	78·5	90·7	83·7	82·0	82·0	80·0
	23	79·7	80·0	80·5	80·0	80·0	83·0	79·7	84·1	80·0	75·2	83·0	80·3
	24	81·5	78·1	78·5	75·3	77·5	*77·0	*50·0	*80·0	*76·5	*83·0	*81·1	*60·0
	25	81·3	83·0	80·5	80·9	78·0	76·3	80·3	80·0	*78·0	*119·0	*86·6	78·0
	26	80·5	81·6	81·6	81·7	82·5	82·8	83·5	83·8	82·9	77·5	80·0	77·5
	27	......	......	......	......	......	......	......	......	......	......	......	......
	28	85·8	74·5	81·5	85·3	78·0	*82·1	*77·0	*85·0	81·5	*82·4	*79·5	*79·2
	29	76·7	77·1	80·0	82·3	77·6	82·5	78·7	79·0	81·5	*82·5	*82·0	*82·5
	30	79·5	80·9	78·0	82·0	79·0	*81·9	*80·4	*79·7	83·6	83·0	83·0	*81·5

Observations noted with a * were made when the Aurora was visible. (a) Off Scale East.

Point Barrow, 1853; Lat. 71° 21′ N. Long. 156° 15′ W. Magnetic Declination.
One Scale-division = 2′·286. Increasing numbers denote increasing Easterly Declination.

12h.	13h.	14h.	15h.	16h.	17h.	18h.	19h.	20h.	21h.	22h.	23h.	Mean Point Barrow Time.	
sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	D.	
												1	October.
												2	
												3	
												4	
												5	
												6	
												7	
												8	
												9	
												10	
......	*78·5	*80·3	*82·3	*83·3	83·3	85·5	89·0	84·3	80·3	83·0	83·5	11	
*80·3	*81·5	*79·5	*83·5	*83·0	83·0	83·5	83·7	84·0	84·0	82·5	83·0	12	
76·5	72·7	*78·8	85·5	88·7	87·3	101·5	136·7	121·3	125·7	82·7	72·5	13	
79·7	79·1	75·5	82·0	83·5	94·3	94·7	97·3	102·3	93·7	78·5	73·8	14	
81·6	92·3	......	......	......	......	......	......	......	......	......	......	15	
......	78·0	93·7	84·5	80·5	85·3	85·0	86·3	88·0	87·0	97·5	97·0	16	
79·5	84·7	75·5	63·7	93·3	81·5	95·0	77·5	83·5	83·5	82·0	79·7	17	
64·0	81·0	80·5	83·5	82·3	84·0	84·5	77·3	79·8	80·7	85·0	80·5	18	
77·0	76·3	*90·0	*76·0	*91·0	*104·0	92·5	92·5	87·7	85·0	85·0	80·0	19	
64·7	*67·5	*85·0	*123·0	99·5	97·7	91·3	91·3	85·3	73·0	79·0	75·0	20	
*76·5	94·5	88·0	84·5	87·3	86·3	81·0	82·0	82·3	81·5	85·5	81·3	21	
*74·3	*67·5	......	......	......	......	......	......	......	......	......	......	22	
......	*117·3	86·3	80·7	84·7	86·0	88·0	87·3	87·5	70·0	71·0	79·7	23	
*70·5	*43·5	*68·5	*67·3	101·0	100·5	125·7	138·9	109·4	80·3	85·0	74·0	24	
*82·7	*81·5	*84·3	*83·3	82·3	81·3	80·5	82·7	83·7	82·5	85·9	79·3	25	
*49·7	*55·0	82·0	86·7	92·0	80·8	93·0	86·5	98·1	87·6	77·0	74·0	26	
*61·5	*79·3	90·3	86·5	87·0	89·5	82·0	86·7	86·5	85·1	80·3	81·3	27	
*81·0	*81·3	*81·3	81·3	88·0	85·7	84·4	91·9	90·1	84·3	82·3	83·5	28	
*79·5	83·0	......	......	......	......	......	......	......	......	......	......	29	
......	*75·5	*73·0	*90·5	*82·0	*136·3	*122·2	(a)	59·1	113·5	100·0	59·0	30	
77·5	86·3	70·3	89·3	86·0	91·5	96·3	102·0	107·5	61·9	72·4	81·4	31	
*68·5	79·1	84·3	84·0	84·0	81·3	88·3	111·3	107·4	110·5	67·0	73·3	1	November.
*88·7	*80·9	*85·5	*84·1	84·5	84·1	83·4	85·0	99·5	84·0	81·5	82·2	2	
*82·7	*81·0	*84·7	*90·0	*93·0	*92·4	89·4	89·4	81·0	81·5	79·4	78·8	3	
80·0	78·3	78·7	78·5	79·7	79·5	80·5	82·7	84·5	84·0	78·9	77·7	4	
78·5	79·4	......	......	......	......	......	......	......	......	......	......	5	
......	*81·4	*82·7	92·4	89·4	83·5	87·1	83·1	81·2	80·3	81·0	75·5	6	
*68·3	*77·5	*81·5	*79·3	*82·0	*83·5	*82·8	*90·3	120·1	119·0	118·0	63·5	7	
*62·5	76·5	126·5	75·6	103·0	83·7	108·0	121·5	100·0	62·4	76·7	82·1	8	
*76·6	*68·5	*3·7	*81·0	*110·5	*111·3	*99·4	106·5	97·5	66·5	70·0	72·3	9	
*100·0	*82·0	*98·5	*108·1	*83·8	*84·4	*88·0	89·5	73·5	80·0	78·7	74·7	10	
79·3	76·0	83·0	*85·0	*96·0	*91·0	*81·6	85·0	90·0	78·7	87·0	85·0	11	
78·0	78·2	......	......	......	......	......	......	......	......	......	......	12	
......	85·2	39·0	82·8	79·0	83·2	83·0	84·5	84·2	84·0	81·0	80·5	13	
79·5	82·0	82·5	87·5	79·8	98·5	89·0	86·2	81·0	83·6	79·3	80·5	14	
82·7	81·5	*85·5	87·5	*98·5	87·5	83·7	72·1	84·3	84·5	82·7	75·9	15	
*80·5	*82·3	76·5	116·7	108·5	92·0	99·0	84·5	83·7	87·8	79·0	79·5	16	
85·0	77·9	82·5	99·0	93·5	97·7	91·7	89·4	92·0	87·5	80·0	75·0	17	
*79·5	*89·3	*82·3	*94·5	84·6	83·3	81·0	90·0	89·0	95·4	82·7	69·7	18	
80·3	85·0	......	......	......	......	......	......	......	......	......	......	19	
......	82·9	85·0	84·9	85·5	87·5	87·5	97·7	84·0	85·0	81·6	69·0	20	
80·0	*111·5	*99·3	82·5	85·9	82·3	98·3	84·0	87·3	95·0	94·0	53·5	21	
81·0	82·6	84·9	88·5	93·7	106·0	99·5	101·8	79·4	82·7	84·7	80·5	22	
81·0	80·5	87·0	84·7	86·0	83·0	88·6	85·5	82·5	83·5	89·0	84·1	23	
*44·0	82·0	88·3	85·5	87·7	86·0	82·0	83·0	*88·5	83·5	81·7	80·5	24	
*81·2	80·0	81·7	81·3	83·8	83·0	82·3	86·0	80·7	80·8	91·6	79·0	25	
80·0	*85·0	......	......	......	......	......	......	......	......	......	......	26	
......	*52·0	*69·0	79·5	86·0	97·5	*104·7	*101·6	94·6	82·0	83·0	85·5	27	
*81·8	*81·0	*85·0	86·7	88·2	81·5	84·0	84·0	84·5	89·5	81·0	81·0	28	
*82·0	*82·2	*85·0	*88·5	*84·9	85·2	85·0	86·7	95·7	89·5	91·7	88·0	29	
*78·7	*55·5	*77·5	*87·1	*86·5	*85·6	*85·0	*86·1	88·3	87·2	81·0	81·8	30	

(a) Off Scale East.

Point Barrow, 1853–1854; Lat. 71° 21′ N. Long. 156° 15′ W. Magnetic Declination.
One Scale-division =2′·286. Increasing numbers denote increasing Easterly Declination.

	Mean Point Barrow Time.	0h.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	8h.	9h.	10h.	11h.
	D.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.
December.	1	80·8	81·5	81·3	82·5	82·0	82·0	*81·1	*79·3	*76·3	*77·0	*99·0	*82·0
	2	80·0	77·7	81·3	79·4	85·3	84·0	80·5	82·3	81·0	81·6	*95·0	*63·5
	3	79·8	77·0	73·5	79·7	83·3	82·1	81·6	79·0	*80·5	*76·3	89·3	*70·3
	4	......	......	......	......	......	......	......	......	......	......	......	......
	5	75·3	77·5	73·5	74·0	76·5	81·3	*81·0	*80·3	*79·3	*76·0	*97·3	*77·4
	6	55·5	60·0	75·7	76·0	77·9	76·9	79·0	82·0	81·8	80·3	81·6	*75·5
	7	77·5	78·2	76·3	78·4	80·3	82·5	75·7	77·5	76·5	82·5	79·7	80·5
	8	82·5	82·5	77·5	80·0	82·5	80·8	77·0	81·4	80·0	84·0	77·7	*78·5
	9	78·8	76·5	79·0	76·0	81·0	81·5	80·3	81·6	79·7	82·5	*79·7	*84·5
	10	79·3	77·7	78·3	78·7	80·5	81·5	*79·0	81·3	80·7	*72·5	*82·6	*79·7
	11	......	......	......	......	......	......	......	......	......	......	......	......
	12	76·5	77·0	80·5	79·0	80·0	80·8	*79·0	*71·5	*71·7	*65·5	*49·0	*63·5
	13	77·5	79·5	71·5	82·7	79·5	*85·0	*79·3	*78·5	*71·7	*97·0	85·3	84·7
	14	77·0	79·3	81·5	81·5	80·0	81·0	82·0	81·5	81·8	79·0	78·2	81·7
	15	74·6	77·5	78·4	77·6	79·8	85·0	83·1	82·0	78·5	84·6	81·0	86·0
	16	75·7	79·7	77·0	79·8	80·8	82·6	80·5	*73·5	82·4	82·3	73·0	*79·5
	17	78·7	77·5	76·7	76·5	78·0	85·0	76·3	72·0	*70·8	87·6	79·3	77·0
	18	......	......	......	......	......	......	......	......	......	......	......	......
	19	74·0	79·7	86·8	81·3	81·5	73·7	81·3	82·0	82·0	82·5	*84·0	*82·8
	20	80·0	83·0	82·0	84·3	77·5	77·2	79·5	81·0	76·7	83·5	96·5	84·5
	21	74·0	72·0	76·5	76·7	78·1	*76·2	*74·5	*80·0	*79·2	*78·5	*77·8	*71·5
	22	74·7	76·3	78·3	68·5	74·0	76·3	76·0	81·1	66·0	87·0	*77·0	*(a)
	23	93·5	75·0	81·6	80·0	*70·5	*82·5	*81·0	*83·0	*82·0	82·6	*100·0	*88·0
	24	73·5	72·7	77·0	78·0	*86·3	*74·0	*84·5	*85·0	*77·5	*77·5	*88·0	*80·5
	25	......	......	......	......	......	......	......	......	......	......	......	......
	26	82·0	84·7	78·5	80·0	80·5	83·0	80·5	84·3	*82·0	*82·9	*87·8	*83·4
	27	78·3	81·0	82·5	80·0	82·0	82·7	83·5	84·3	82·5	82·5	83·6	82·3
	28	79·0	80·3	81·0	75·0	77·6	78·7	*77·5	*85·0	*82·7	*78·0	*78·0	*72·5
	29	82·3	80·5	84·5	82·5	80·0	84·0	83·7	82·3	83·5	81·0	*84·3	*82·3
	30	83·4	79·8	78·3	80·5	81·1	*87·0	*77·5	*82·5	*78·0	*73·7	*84·9	*88·0
	31	73·5	77·5	80·0	82·7	83·5	*80·3	*81·7	*81·0	*85·5	*79·7	*80·1	*101·0
January.	1	......	......	......	......	......	......	......	......	......	......	......	......
	2	51·7	82·5	77·5	90·0	*67·5	*69·0	*87·5	*79·0	*88·5	*76·5	*68·7	*109·0
	3	83·9	79·3	86·0	81·4	80·3	92·0	80·0	78·5	85·5	79·0	80·5	*85·2
	4	81·5	75·0	78·0	84·3	78·7	79·5	85·0	82·5	*84·0	*85·0	*82·0	*80·0
	5	81·5	81·0	81·5	81·7	78·1	79·5	81·7	79·4	80·0	82·0	84·0	83·5
	6	80·7	81·0	79·5	79·7	80·5	81·5	82·0	81·1	83·3	83·7	81·7	78·5
	7	70·9	73·7	78·3	81·0	81·5	*73·0	*74·0	*74·0	*74·0	*76·5	*137·0	*73·0
	8	......	......	......	......	......	......	......	......	......	......	......	......
	9	80·0	81·3	85·0	84·0	84·3	84·0	84·0	86·7	87·7	89·5	84·5	81·0
	10	85·7	86·5	85·5	87·5	86·0	85·6	86·5	85·0	85·3	85·3	86·3	84·5
	11	82·7	86·3	83·7	81·5	82·9	83·0	83·5	84·0	87·3	88·7	75·5	78·5
	12	73·0	80·0	74·5	77·1	85·6	82·3	83·4	79·0	(b)	......	......	......
	13	......	......	......	......	......	......	......	......	83·0	80·5	79·5	110·5
	14	76·5	80·0	74·5	77·5	82·0	76·5	74·0	80·0	*80·8	79·0	76·4	80·0
	15	......	......	......	......	......	......	......	......	......	......	......	......
	16	76·0	82·5	86·0	84·5	74·9	91·7	90·5	80·5	78·0	69·5	95·7	79·0
	17	73·5	78·0	62·0	91·7	83·1	89·5	*82·0	84·4	86·3	85·3	87·0	82·0
	18	78·0	79·0	78·9	78·2	82·9	81·0	83·7	*81·8	*82·2	*82·0	84·9	81·2
	19	92·5	77·5	76·7	77·5	79·4	78·0	76·0	*82·5	91·0	80·5	87·3	80·5
	20	92·5	80·3	82·0	85·5	81·5	89·5	88·4	82·0	90·0	81·5	91·5	82·7
	21	87·0	73·5	81·5	86·1	87·0	88·8	88·1	87·5	89·7	85·5	*90·5	*92·5
	22	......	......	......	......	......	......	......	......	......	......	......	......
	23	80·8	68·3	74·3	77·0	78·0	*83·5	*78·5	*81·3	*83·0	*78·5	*82·0	*80·0
	24	73·0	75·3	77·5	76·8	78·0	85·3	77·8	84·0	*80·5	*81·5	81·4	81·0
	25	77·5	74·0	76·6	78·5	82·0	70·0	79·1	74·0	72·3	72·5	79·5	72·0
	26	80·0	79·0	78·5	79·5	80·0	80·0	80·5	81·0	79·6	*80·0	80·0	81·0
	27	78·0	79·3	80·0	81·5	81·7	81·5	81·0	82·2	*82·0	*81·2	*81·5	*77·5
	28	85·0	82·0	66·5	72·0	80·0	77·0	80·0	84·5	82·0	67·0	68·0	*80·3
	29	......	......	......	......	......	......	......	......	......	......	......	......
	30	75·0	74·0	76·0	73·0	76·0	80·0	85·0	*85·0	*82·0	*83·5	*83·0	*81·0
	31	84·6	76·0	80·0	81·3	84·0	83·0	82·0	*82·3	*83·5	*82·5	*128·0	*78·0

Observations noted with a * were made when the Aurora was visible. (a) Off Scale West.
(b) Observatory blocked up by the snow-drift raised by a heavy gale from the S.W.

Point Barrow, 1853–1854; Lat. 71° 21′ N. Long. 156° 15′ W. Magnetic Declination.
One Scale-division =2′·286. Increasing numbers denote increasing Easterly Declination.

12h.	13h.	14h.	15h.	16h.	17h.	18h.	19h.	20h.	21h.	22h.	23h.	Mean Point Barrow Time.	
sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	D.	
78·6	*80·0	*80·0	*81·5	*83·5	*84·5	*86·7	*92·3	88·9	86·7	82·6	82·6	1	December.
63·0	81·5	92·5	86·4	86·5	87·5	*100·3	*90·0	85·5	98·6	83·5	83·5	2	
*65·5	80·2	......	......	......	......	......	......	......	......	......	......	3	
......	*84·5	*82·0	*90·0	*99·0	*89·8	*81·5	*78·6	80·8	83·5	81·9	72·5	4	
*74·4	61·5	*70·5	*84·0	*93·5	93·0	114·6	(a)	100·0	99·0	70·0	66·5	5	
*81·1	*73·3	*83·0	*80·5	*84·5	82·0	74·0	75·0	76·0	90·5	74·0	88·0	6	
81·0	79·7	*92·0	*91·1	*80·5	*89·7	*90·5	*102·0	*109·4	84·5	83·0	73·5	7	
*77·0	*77·0	*62·5	*86·8	*82·0	*84·5	*84·0	*82·5	83·5	82·3	79·5	84·4	8	
*85·0	*77·0	*84·5	*82·5	*82·0	87·9	80·0	79·3	82·0	83·0	81·5	80·7	9	
*78·5	*68·7	......	......	......	......	......	......	......	......	......	......	10	
......	*79·5	*80·3	83·0	83·5	86·5	82·7	*92·3	*78·6	82·5	79·5	83·0	11	
*73·0	*104·5	*122·0	85·3	*136·0	*71·2	*80·1	*39·0	*75·6	127·0	*57·5	77·5	12	
80·0	75·5	75·5	80·6	79·0	85·0	77·5	83·0	81·5	82·5	80·5	74·5	13	
49·0	45·0	85·3	83·9	89·9	84·5	93·0	105·5	83·5	85·2	79·5	79·5	14	
66·3	*41·7	*66·5	*72·3	*100·7	*107·3	*102·7	75·3	92·0	84·5	83·5	81·0	15	
*76·0	*105·3	*105·0	*88·0	*85·0	80·8	89·0	83·0	83·2	92·3	88·5	80·3	16	
61·0	*61·9	......	......	......	......	......	......	......	......	......	......	17	
......	*78·3	*85·8	84·5	*88·7	*88·5	*90·5	*84·0	*96·5	97·6	100·0	84·0	18	
*56·0	63·5	84·8	96·3	91·3	89·5	86·0	90·5	87·5	77·0	77·0	79·5	19	
76·0	*79·0	*116·5	*95·6	129·7	*78·0	*113·0	*84·4	90·6	*110·7	92·7	78·0	20	
84·2	*(b)	*85·5	80·0	84·0	93·0	93·0	98·0	100·0	98·0	84·7	76·0	21	
*94·0	83·0	*77·7	*89·7	*81·5	*84·5	*88·5	*88·5	*85·0	*114·1	*89·8	70·0	22	
*66·5	*118·2	*55·0	*80·3	*87·5	*93·3	*91·3	107·7	*129·7	*108·0	82·5	81·5	23	
*88·0	*83·2	......	......	......	......	......	......	......	......	......	......	24	
......	*88·0	*79·5	*85·0	*80·5	*87·7	*81·0	*85·0	*89·0	*84·0	87·0	87·5	25	
83·0	*79·9	*81·7	*81·7	*79·9	*81·0	*84·3	*85·0	*86·0	*84·3	85·0	85·0	26	
82·5	83·3	83·8	88·5	104·3	116·5	*113·3	*88·7	89·3	*95·7	81·0	80·5	27	
*87·0	*86·5	*86·5	*83·6	*93·5	*94·3	*130·3	*110·0	*77·5	76·5	81·0	77·4	28	
*77·5	*77·0	*71·5	*102·5	*87·5	*85·7	*86·0	*83·3	*85·0	84·0	85·0	82·5	29	
*87·0	*85·0	*75·7	*84·0	*77·4	*95·0	*87·5	*100·0	*94·5	80·5	77·5	85·0	30	
*54·6	*80·1	......	......	......	......	......	......	......	......	......	......	31	
......	*72·0	*108·0	*77·5	*99·1	*102·5	*149·0	*(a)	*90·8	80·3	97·0	86·0	1	January.
83·0	96·5	91·0	71·0	87·5	91·8	120·5	100·3	116·5	104·5	74·5	78·7	2	
*79·0	*77·3	*75·0	*62·5	*87·5	*85·5	*95·0	*86·5	*88·0	88·0	80·0	81·0	3	
*113·0	*75·6	*81·5	*88·0	*89·0	*88·7	*88·5	*102·0	*100·7	*74·5	80·0	77·5	4	
80·0	80·5	83·5	85·0	*82·5	*90·0	*87·5	91·5	78·7	81·5	82·5	81·5	5	
*79·7	*82·5	*90·5	*87·0	*90·0	*87·0	*93·0	*83·0	*95·5	91·1	103·5	79·0	6	
*78·3	*59·1	......	......	......	......	......	......	......	......	......	......	7	
......	*73·7	*89·0	*98·3	86·0	*90·7	*92·5	*89·5	*92·7	86·0	85·7	81·5	8	
79·0	76·0	79·5	97·3	88·0	89·0	91·1	90·5	90·8	88·5	86·0	83·5	9	
93·5	82·5	90·5	105·0	100·5	97·0	86·3	91·0	94·0	88·5	83·7	81·4	10	
51·0	89·5	82·5	102·0	108·4	89·0	95·0	105·5	112·5	85·0	110·0	62·0	11	
......	......	......	......	......	......	......	......	......	......	......	......	12	
97·5	86·3	85·4	74·5	103·5	93·5	90·0	112·0	97·0	78·5	75·5	82·0	13	
76·3	86·0	......	......	......	......	......	......	......	......	......	......	14	
......	82·5	85·0	87·5	*149·0	*106·5	*113·5	*75·5	*76·5	110·0	87·5	77·0	15	
84·0	85·3	131·0	86·1	92·2	85·3	85·7	97·0	90·5	84·7	121·5	112·5	16	
85·0	80·5	103·5	101·0	83·3	97·4	98·0	107·0	97·0	90·0	80·8	91·0	17	
*78·6	*142·0	*75·0	*77·2	81·8	87·0	142·0	127·8	83·0	75·6	97·0	104·0	18	
115·0	102·0	100·7	101·5	101·5	100·5	97·5	96·0	110·0	85·0	74·0	64·5	19	
70·0	73·0	89·5	95·3	101·0	90·5	95·0	107·7	81·0	89·0	85·0	86·0	20	
88·0	*89·5	......	......	......	......	......	......	......	......	......	......	21	
......	76·5	*80·0	*77·0	*72·5	*92·0	*90·5	*95·5	*102·5	*105·5	128·0	70·0	22	
*76·5	*80·3	40·5	65·7	102·5	97·5	89·0	102·7	95·5	95·0	86·7	80·6	23	
80·6	80·0	81·0	81·7	81·5	82·3	78·3	86·3	81·0	83·5	85·0	83·0	24	
81·0	81·5	78·1	83·6	84·0	83·5	83·6	85·1	85·8	81·0	80·0	79·0	25	
80·0	*75·0	*80·5	*86·7	*84·0	*82·2	*86·3	*79·5	81·8	78·0	78·2	78·0	26	
*81·0	*80·0	*84·5	*93·0	*88·0	*79·0	*84·0	*85·5	83·0	87·5	84·5	98·3	27	
*55·9	*76·5	......	......	......	......	......	......	......	......	......	......	28	
......	82·0	107·5	75·5	84·0	79·2	92·5	107·3	127·7	95·5	144·0	74·0	29	
*82·5	*67·5	*77·5	*75·0	*82·0	*88·5	*98·0	*87·0	94·5	100·0	85·3	76·0	30	
*77·0	*80·5	*82·5	*83·3	*88·0	*79·0	*91·5	*87·0	*89·5	94·0	81·5	81·3	31	

(a) Off Scale East. (b) Off Scale West.

Point Barrow, 1854; Lat. 71° 21′ N. Long. 156° 15′ W. Magnetic Declination.
One Scale-division =2′·286. Increasing numbers denote increasing Easterly Declination.

Mean Point Barrow Time.	D.	0h.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	8h.	9h.	10h.	11h.
		sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.
February.	1	82·0	78·6	79·6	77·0	84·5	85·0	83·5	*81·5	*83·0	*85·0	*87·0	*83·3
	2	82·0	86·0	80·0	83·0	78·2	86·4	83·8	84·0	*84·5	*85·0	*84·0	*85·0
	3	81·5	82·0	82·0	78·0	80·0	81·3	*77·0	*85·0	*83·0	*79·7	*82·0	*82·0
	4	78·7	79·5	66·5	79·7	80·3	79·0	76·5	*80·0	85·0	76·0	75·2	135·0
	5	......	......	......	......	......	......	......	......	......	......	......	......
	6	81·0	76·4	86·5	84·1	84·1	83·3	84·0	*85·0	*83·5	*83·0	*83·0	*81·5
	7	81·0	80·5	81·0	83·0	82·0	79·3	80·0	*84·0	*130·0	*88·0	*76·0	*72·0
	8	81·0	85·0	86·5	88·0	83·5	84·5	84·5	85·2	84·8	83·2	84·5	80·0
	9	71·0	85·0	71·0	79·5	85·5	84·0	81·0	*80·0	*86·0	84·3	*75·0	*154·0
	10	54·5	75·5	85·0	82·0	84·5	82·2	84·0	83·0	77·0	*76·5	*32·5	*105·0
	11	74·0	85·0	81·0	80·0	81·0	80·0	91·0	85·0	84·0	81·5	78·0	84·0
	12	......	......	......	......	......	......	......	......	......	......	......	......
	13	73·0	80·0	77·2	76·0	77·0	72·0	78·5	87·5	85·0	74·8	66·9	59·5
	14	71·5	76·3	80·0	74·5	71·2	74·6	*73·0	*82·0	87·0	*73·0	*72·5	*89·0
	15	82·0	72·0	76·5	72·0	83·0	80·0	80·0	*86·8	*76·0	*94·7	*75·0	*84·0
	16	77·5	84·7	83·5	67·0	89·0	66·0	75·0	72·5	81·0	91·5	85·0	62·0
	17	74·5	81·7	78·0	78·0	88·0	81·5	87·0	84·5	80·0	83·0	88·5	*81·0
	18	77·0	79·5	76·0	78·3	79·3	84·2	78·0	*81·0	85·0	*82·0	*81·0	*83·5
	19	......	......	......	......	......	......	......	......	......	......	......	......
	20	84·0	82·0	84·0	84·5	84·5	82·5	83·0	*82·7	*82·0	*85·0	*83·0	*81·0
	21	85·0	81·0	79·0	80·0	84·5	81·5	81·7	78·0	80·5	84·3	84·0	83·0
	22	81·0	83·0	84·0	84·1	83·5	83·0	84·0	81·5	80·0	82·0	82·5	*81·5
	23	79·0	78·5	83·0	84·0	83·0	83·5	83·0	84·0	83·0	76·5	80·0	*78·0
	24	65·5	82·0	77·5	71·4	63·8	86·3	86·0	82·5	*83·7	*77·5	*79·3	*78·3
	25	75·5	76·0	81·0	80·7	83·5	56·0	94·5	*89·0	*71·0	*97·0	*87·5	*76·5
	26	......	......	......	......	......	......	......	......	......	......	......	......
	27	75·5	82·5	60·5	68·5	70·5	90·0	76·0	82·0	85·0	92·0	81·0	71·0
	28	82·3	73·5	77·0	74·5	81·0	74·0	76·0	76·3	80·5	80·5	*84·0	*90·0
March.	1	80·5	79·0	89·6	84·5	84·5	81·5	79·0	78·5	*84·0	*82·5	*86·0	*82·2
	2	82·0	85·0	78·0	88·0	75·0	74·6	82·4	80·0	82·5	85·0	*84·0	79·0
	3	104·0	77·5	83·0	84·0	84·0	81·3	84·2	82·0	94·0	*87·0	*84·5	*74·0
	4	95·0	77·5	85·5	85·0	87·5	89·0	85·0	87·0	89·0	*87·3	*93·9	*83·5
	5	......	......	......	......	......	......	......	......	......	......	......	......
	6	87·5	92·1	81·1	88·0	84·0	87·0	82·0	89·0	81·0	85·0	*90·0	*73·1
	7	80·5	82·0	85·0	82·0	87·0	85·0	87·5	90·0	91·5	88·5	*89·0	81·5
	8	83·0	70·0	83·5	86·0	84·0	86·0	87·5	89·0	*86·3	*85·5	*77·5	*73·5
	9	87·3	86·0	86·0	88·0	87·0	88·0	87·5	88·0	88·0	*89·5	*88·0	*89·0
	10	91·0	89·5	89·0	87·5	88·0	88·0	86·7	85·0	85·8	*77·5	*101·5	*86·0
	11	92·5	90·0	88·0	87·5	86·0	88·2	89·0	89·4	88·5	87·0	88·5	90·0
	12	......	......	......	......	......	......	......	......	......	......	......	......
	13	92·5	89·0	82·8	82·2	81·6	77·0	84·5	87·0	89·0	82·0	78·0	*27·0
	14	87·0	85·5	86·0	85·0	79·0	68·0	84·2	79·8	86·5	80·0	89·0	84·0
	15	63·0	107·5	133·5	85·0	76·0	49·0	92·0	74·5	*85·0	*98·7	*67·0	*56·0
	16	77·0	74·0	81·0	50·3	81·0	78·0	76·0	92·0	*63·5	*81·0	*78·0	*106·6
	17	86·0	81·0	78·0	75·3	85·2	81·0	80·0	86·0	84·0	*79·0	*79·0	*89·0
	18	84·0	82·0	81·3	85·0	85·3	85·0	84·6	87·5	85·5	86·0	85·0	*78·0
	19	......	......	......	......	......	......	......	......	......	......	......	......
	20	80·0	81·5	85·5	81·5	83·0	84·0	82·5	83·0	85·2	*84·0	*82·0	*71·3
	21	81·0	76·0	83·2	78·0	79·0	80·0	78·5	84·0	81·0	*85·0	*84·0	*83·3
	22	74·0	80·0	82·5	81·0	81·5	82·0	81·0	81·0	82·3	83·0	*82·7	*83·0
	23	89·0	84·0	83·0	82·0	82·0	84·0	81·2	84·5	83·8	*80·0	*86·2	*79·0
	24	81·0	72·0	84·0	85·2	83·2	82·5	82·5	81·0	82·3	81·1	82·7	*78·6
	25	79·7	70·0	72·0	75·4	82·4	75·5	80·5	80·5	81·0	*78·0	*67·0	*106·5
	26	......	......	......	......	......	......	......	......	......	......	......	......
	27	89·4	101·0	93·0	88·0	76·0	76·0	66·9	56·6	52·5	65·0	74·5	38·5
	28	81·7	65·3	75·0	67·5	65·5	66·0	71·0	76·6	72·4	*83·5	*80·0	*79·0
	29	76·0	79·0	79·2	81·2	75·3	83·5	77·2	80·0	79·0	78·5	*88·3	*77·0
	30	83·5	71·5	86·0	66·0	76·8	70·4	68·4	76·5	79·1	69·0	*65·0	*60·0
	31	80·5	81·5	81·0	79·0	80·0	81·5	81·0	82·2	77·0	80·5	*83·8	*73·8

Observations noted with a * were made when the Aurora was visible.

Point Barrow, 1854; Lat. 71° 21′ N. Long. 156° 15′ W. Magnetic Declination.
One Scale-division =2′·286. Increasing numbers denote increasing Easterly Declination.

12h.	13h.	14h.	15h.	16h.	17h.	18h.	19h.	20h.	21h.	22h.	23h.	Mean Point Barrow Time.	
sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	D.	
*84·5	*81·2	*86·2	*85·0	*85·5	*90·0	*99·5	84·0	84·5	86·0	82·0	82·0	1	February.
*85·0	*85·7	*86·0	*89·0	*84·0	*86·6	*87·0	*87·4	87·0	87·0	87·0	87·0	2	
*78·0	*72·0	*75·0	*110·0	*100·0	*90·5	*85·0	*91·5	100·4	112·0	74·0	71·5	3	
70·0	91·7	......	......	......	......	......	......	......	......	......	......	4	
......	*80·0	*72·0	*82·5	*112·0	*112·5	*118·0	*85·0	82·5	82·0	81·5	84·0	5	
*80·0	*83·5	*96·5	*96·8	*86·0	*87·0	*93·0	*90·5	117·0	91·0	78·0	78·0	6	
*79·0	*87·0	*95·0	*90·0	*87·5	*99·5	*88·5	*90·5	83·9	83·3	90·5	83·4	7	
*93·0	*81·5	*98·0	*91·5	90·0	*91·0	*90·0	*94·0	85·0	83·7	103·1	91·1	8	
*(a)	*48·0	*72·5	*105·0	*89·0	*116·0	*140·0	*112·0	88·0	(b)	123·5	129·5	9	
*50·0	*80·5	*143·5	*94·0	*89·0	*108·3	*112·5	*(b)	129·7	84·0	55·0	80·0	10	
70·5	90·0	......	......	......	......	......	......	......	......	......	......	11	
......	81·5	81·0	90·0	72·0	88·0	90·0	95·0	112·5	136·0	82·3	116·0	12	
*80·5	87·0	82·0	*87·0	*122·4	*102·0	*95·0	79·5	117·3	125·0	107·5	101·5	13	
*93·5	*77·0	*110·0	*107·5	*81·0	*81·0	*130·0	(b)	105·2	81·5	38·0	86·0	14	
*80·5	*67·5	*46·0	*80·5	*72·0	*72·0	*102·0	*117·6	*117·6	71·0	68·0	75·5	15	
80·0	81·5	109·0	67·0	77·5	95·0	98·0	111·5	111·0	86·4	83·0	70·0	16	
*126·5	*87·5	*61·0	*112·4	95·0	*91·0	87·5	84·0	97·0	100·0	92·0	83·0	17	
*84·0	*79·0	......	......	......	......	......	......	......	......	......	......	18	
......	*79·0	*85·0	*86·0	*85·5	*92·3	*88·0	*85·0	85·0	85·0	85·6	83·8	19	
*87·2	*85·5	*85·0	*84·0	*92·0	*94·0	*95·0	94·0	90·0	91·0	88·0	87·3	20	
*83·2	*83·4	*89·5	*86·0	*97·0	*87·5	*80·0	88·5	85·7	82·5	90·0	82·0	21	
*82·0	*83·5	*97·7	*81·5	*85·0	86·5	84·5	84·0	92·0	102·0	91·0	87·0	22	
*68·5	*76·5	*77·0	*83·0	*79·0	*110·7	*98·0	116·0	(b)	113·0	97·0	94·0	23	
*65·0	*69·4	*93·0	*96·6	*(b)	*(b)	97·5	87·8	94·0	94·5	83·0	74·0	24	
*68·5	*75·0	......	......	......	......	......	......	......	......	......	......	25	
......	80·0	77·7	83·2	69·5	99·5	102·5	90·0	109·1	102·0	98·7	80·0	26	
95·3	89·0	96·5	93·0	87·0	92·0	99·5	102·7	86·2	85·0	77·8	85·0	27	
85·0	*73·5	*78·5	*84·5	85·2	*105·0	96·0	99·0	101·5	108·0	92·1	86·0	28	
*79·0	*73·0	*86·0	*86·2	*85·4	*84·0	86·8	95·0	96·5	106·0	87·0	89·0	1	March.
81·5	83·0	82·0	111·1	79·0	87·5	97·0	99·0	99·5	76·0	80·5	77·5	2	
*88·0	*77·5	*103·5	*101·0	94·0	99·0	95·9	100·0	83·5	86·0	93·0	77·0	3	
*88·2	*88·5	......	......	......	......	......	......	......	......	......	......	4	
......	*89·0	*97·5	115·7	90·0	91·0	87·5	102·0	113·3	108·0	72·0	71·5	5	
*75·0	*85·3	*83·5	*98·5	*106·0	*82·0	*102·0	105·5	105·0	112·0	85·5	76·0	6	
85·5	*90·0	*86·0	*88·0	*92·0	*88·5	92·0	94·3	111·7	92·0	90·0	89·8	7	
*(b)	*81·5	87·0	90·5	*81·3	87·0	89·0	99·0	121·0	77·0	85·5	85·0	8	
*94·5	*89·7	*86·0	94·5	93·6	92·8	94·5	91·0	89·5	90·0	91·0	90·5	9	
*101·5	93·0	92·0	95·2	91·0	93·4	92·0	94·0	101·5	91·0	90·5	89·0	10	
91·8	84·0	......	......	......	......	......	......	......	......	......	......	11	
......	89·0	93·5	91·5	94·8	92·0	98·0	103·5	108·0	112·0	116·6	81·0	12	
*81·0	89·2	85·5	85·5	91·9	103·5	94·3	98·5	91·5	89·0	87·0	88·0	13	
*86·0	*74·0	*80·0	*93·0	*86·0	89·6	91·6	91·0	87·2	124·0	138·3	83·3	14	
58·5	*89·0	*99·5	*58·0	*87·0	130·5	106·5	157·5	145·5	110·0	155·3	106·0	15	
*86·0	*67·5	*116·4	*88·0	*92·1	87·0	88·0	92·0	99·0	92·0	80·0	91·0	16	
*83·6	*32·5	*69·5	*87·5	*90·5	89·5	84·0	89·0	92·0	91·0	90·0	89·0	17	
*75·5	*88·0	......	......	......	......	......	......	......	......	......	......	18	
......	*89·0	*85·0	*89·5	*93·5	108·0	88·0	93·5	96·0	100·0	103·0	88·0	19	
*76·9	*84·5	*75·5	*79·0	90·0	96·0	102·0	103·0	93·0	96·2	95·5	84·3	20	
*77·8	*85·0	*86·7	*87·5	86·0	79·0	80·7	118·0	111·5	99·0	87·5	86·0	21	
83·0	83·0	81·0	89·2	98·0	86·7	92·3	93·0	101·0	96·5	82·0	81·5	22	
*84·8	*81·0	*85·0	*88·0	86·0	87·2	90·8	87·0	105·5	106·7	94·0	77·0	23	
*77·6	*82·0	*90·5	*106·8	114·3	89·5	126·0	108·0	87·5	120·0	106·3	78·2	24	
*113·6	*86·6	......	......	......	......	......	......	......	......	......	......	25	
......	*120·5	*85·2	*90·0	107·5	91·6	87·1	70·8	93·2	90·5	85·3	86·0	26	
118·0	102·0	98·0	68·5	123·5	56·7	116·9	101·3	108·9	90·6	55·8	99·6	27	
*78·0	*74·5	*81·7	*91·0	88·5	85·0	90·5	103·5	89·5	108·3	91·7	80·0	28	
*79·0	*64·1	*49·8	89·5	74·0	90·0	87·5	92·8	134·3	120·0	95·5	90·5	29	
*69·0	*96·0	*81·0	81·7	96·0	96·5	98·0	91·0	104·0	81·3	85·0	81·5	30	
*67·7	*†77·5	*†78·5	*†84·0	†87·5	84·0	90·0	83·7	†95·8	†110·0	79·5	81·0	31	

(a) Off Scale West. (b) Off Scale East. † Magnet vibrating.

Point Barrow, 1854; Lat. 71° 21′ N. Long. 156° 15′ W. Magnetic Declination.
One Scale-division =2′·286. Increasing numbers denote increasing Easterly Declination.

Mean Point Barrow Time.		0h.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	8h.	9h.	10h.	11h.
	D.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.
April.	1	74·5	85·0	85·0	†91·9	†85·5	†82·5	†86·5	87·5	85·7	85·5	83·2	85·0
	2	......	......	......	......	......	......	......	......	......	......	......	......
	3	†79·5	81·5	†87·7	83·0	82·8	82·3	86·0	92·0	81·5	†89·5	†85·5	†84·7
	4	81·6	†85·0	86·5	80·5	82·5	82·3	87·5	85·2	87·0	86·0	84·8	85·0
	5	82·8	86·0	87·8	81·5	86·0	82·5	82·0	85·2	85·2	85·8	85·0	83·0
	6	86·0	84·0	82·8	83·0	82·6	86·0	84·8	84·0	80·5	79·0	88·0	86·0
	7	85·0	†84·3	85·0	83·0	84·0	79·0	78·5	78·0	79·0	85·0	†*97·5	†*75·0
	8	85·5	85·5	†83·5	†81·5	81·0	†85·8	84·0	85·3	84·6	85·0	85·5	85·2
	9	......	......	......	......	......	......	......	......	......	......	......	......
	10	86·3	99·0	†109·0	†58·0	90·2	75·2	55·8	60·3	93·5	71·2	40·0	†58·5
	11	†71·0	†91·1	86·0	†81·5	81·0	84·7	85·2	85·2	89·0	83·0	84·0	84·0
	12	†88·3	89·5	80·0	81·0	82·0	87·0	86·0	84·0	84·2	85·2	†79·8	†144·3
	13	84·6	80·5	†80·3	85·0	84·6	84·0	85·0	84·0	79·3	84·2	85·2	85·2
	14	†76·0	68·5	66·5	70·0	86·5	80·0	80·5	81·0	82·0	84·5	79·5	76·0
	15	87·0	79·5	†68·7	85·3	79·8	86·2	77·5	86·5	87·8	87·0	87·0	82·7
	16	......	......	......	......	......	......	......	......	......	......	......	......
	17	89·0	86·5	86·0	87·5	85·1	84·0	85·5	85·5	88·0	81·5	83·3	83·4
	18	78·3	79·5	80·0	81·3	81·0	82·5	†74·7	†77·5	†64·5	†33·5	70·0	76·3
	19	†94·2	†84·0	†70·2	†84·0	†78·0	†69·5	87·3	†81·6	93·0	†81·3	†111·3	110·7
	20	76·5	78·0	84·0	†77·5	78·0	79·0	82·3	80·5	78·0	84·0	88·0	85·2
	21	76·0	80·5	81·0	78·8	78·0	85·0	90·0	89·7	86·0	85·5	86·0	†78·1
	22	91·0	74·6	†78·5	75·0	77·0	73·0	81·5	83·5	75·0	86·0	73·3	87·0
	23	......	......	......	......	......	......	......	......	......	......	......	......
	24	†97·4	76·5	†62·0	†63·7	†80·0	†72·8	78·0	†64·5	†73·8	†77·3	85·8	64·0
	25	80·4	†77·1	78·8	†80·3	†75·7	79·3	80·0	80·0	80·3	81·0	†82·5	80·0
	26	†80·0	†77·7	†78·0	†78·5	†80·0	77·2	†76·7	†72·5	75·0	†71·0	†81·3	68·0
	27	†93·0	†68·3	†66·5	†58·5	80·0	84·5	†81·9	†79·3	83·5	96·7	85·0	78·0
	28	†70·0	†77·7	†80·0	†79·0	†80·5	†80·5	82·0	69·0	88·0	95·0	83·5	87·0
	29	†88·7	72·8	†75·0	†78·9	†75·3	81·0	78·5	90·8	67·5	82·5	84·0	90·0
	30	......	......	......	......	......	......	......	......	......	......	......	......
May.	1	82·5	79·7	82·0	82·3	78·0	65·0	80·0	83·0	81·5	82·5	82·0	†74·5
	2	83·0	81·0	81·0	80·5	81·0	80·0	81·0	73·0	87·0	†68·0	†68·4	†86·0
	3	85·0	82·9	†84·3	86·0	81·8	81·0	81·0	79·0	82·8	84·0	83·7	81·0
	4	81·0	92·3	93·0	†76·7	77·5	†77·0	†81·9	85·0	70·0	98·5	69·3	†44·5
	5	†75·5	79·5	77·0	81·0	83·0	84·0	83·0	†84·0	83·5	83·0	83·0	83·0
	6	80·5	81·0	81·0	81·0	82·0	82·7	81·5	85·3	84·0	82·5	84·8	82·8
	7	......	......	......	......	......	......	......	......	......	......	......	......
	8	77·5	70·0	69·0	†77·5	75·2	73·0	†69·7	86·0	†76·0	66·1	53·8	76·2
	9	87·0	84·5	75·5	77·8	78·8	76·0	80·0	80·0	82·8	73·9	86·0	75·8
	10	74·0	81·5	67·3	76·5	80·5	79·0	81·3	†77·5	69·0	83·5	†66·1	†73·3
	11	88·0	80·2	81·0	†78·5	†72·5	77·5	83·0	82·0	87·5	77·3	76·6	80·0
	12	70·1	73·7	†75·5	77·4	79·0	79·0	79·0	81·5	85·3	81·0	75·9	72·3
	13	77·5	79·3	†79·5	79·0	81·1	81·0	81·0	80·0	†81·3	80·8	77·0	†80·0
	14	......	......	......	......	......	......	......	......	......	......	......	......
	15	†75·0	†54·5	†103·9	†96·5	†81·9	†89·5	†86·0	86·0	86·0	86·0	84·3	81·0
	16	58·0	68·0	†79·8	†88·6	61·5	81·5	85·8	70·0	†102·0	87·0	72·5	42·8
	17	72·0	84·0	(a)	(a)	(a)	82·0	80·0	†84·5	†86·1	90·0	†75·0	†73·5
	18	†83·3	84·0	81·0	81·0	81·5	83·5	84·0	79·0	84·0	80·5	81·0	85·8
	19	75·6	†80·7	†79·6	74·5	80·0	79·2	72·0	79·0	†64·7	81·3	71·0	77·8
	20	†102·0	†72·7	†80·0	†75·4	†83·0	81·5	†80·8	78·0	81·0	76·8	77·0	84·5
	21	......	......	......	......	......	......	......	......	......	......	......	......
	22	79·5	84·0	82·5	†80·5	†79·5	74·0	80·5	81·3	76·0	83·5	76·5	73·0
	23	80·0	82·0	82·2	†77·6	76·5	78·0	78·0	79·2	80·5	†73·6	80·7	73·0
	24	80·0	77·0	79·6	79·8	79·8	82·8	†83·6	82·0	84·0	78·5	79·3	78·3
	25	69·5	†77·1	†77·9	†80·3	77·0	74·0	77·4	88·5	†76·5	†102·5	†59·0	†76·0
	26	78·0	73·5	73·7	77·2	77·5	67·4	92·0	85·0	79·3	83·3	83·8	70·0
	27	83·0	75·5	82·0	87·5	†83·6	†80·0	†77·0	84·8	84·3	86·5	80·5	85·0
	28	......	......	......	......	......	......	......	......	......	......	......	......
	29	†84·0	†78·7	87·0	79·7	77·5	79·0	86·0	74·5	84·5	81·0	83·0	78·0
	30	89·0	91·0	†85·5	81·0	81·0	82·8	86·0	75·0	85·2	79·5	84·7	80·0
	31	80·8	82·0	†92·0	83·0	71·0	88·5	77·3	82·5	78·7	†80·5	84·5	86·0

Observations noted with a * were made when the Aurora was visible.

† Magnet vibrating. (a) Unroofing Observatory.

Point Barrow, 1854; Lat. 71° 21′ N. Long. 156° 15′ W. Magnetic Declination.
One Scale-division =2′·286. Increasing numbers denote increasing Easterly Declination.

12h.	13h.	14h.	15h.	16h.	17h.	18h.	19h.	20h.	21h.	22h.	23h.	Mean Point Barrow Time.	
sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	D.	
†*82·7	†*89·3	......	......	......	......	......	......	......	......	......	......	1	April.
......	87·0	87·5	85·5	89·6	†101·5	†110·7	94·5	87·8	†90·7	†79·5	†90·5	2	
85·0	†87·5	81·3	91·5	91·5	88·0	98·7	†91·8	97·4	96·7	86·0	87·5	3	
85·0	82·0	82·0	†90·0	†97·0	100·0	112·2	†115·0	†87·4	†83·6	76·7	84·2	4	
84·5	†60·0	90·0	86·8	91·5	†101·7	†88·5	89·0	88·0	89·0	90·5	80·0	5	
83·5	86·0	87·5	89·0	90·3	89·0	88·0	91·8	89·0	89·0	88·0	85·0	6	
†66·0	†*81·3	†*90·5	88·0	84·5	88·0	90·7	92·0	89·7	89·8	91·4	84·5	7	
†*83·8	†*91·5	......	......	......	......	......	......	......	......	......	......	8	
......	†83·1	87·5	88·0	89·8	89·0	98·5	†107·0	†136·0	†98·0	76·5	80·0	9	
*(a)	†70·7	87·5	89·2	86·0	100·8	96·5	†103·3	94·8	†91·0	84·5	†103·5	10	
†70·5	96·5	†98·6	88·0	88·0	91·7	93·7	95·4	†93·0	90·5	89·5	86·0	11	
87·5	85·0	88·5	88·5	89·5	80·0	89·3	†102·4	†134·0	94·3	†87·3	†86·5	12	
85·0	†86·3	83·5	82·2	84·0	†98·5	†142·0	(b)	†157·0	(b)	†114·5	†85·0	13	
†*119·7	70·7	†96·2	†91·1	84·6	83·0	85·5	†93·2	79·5	80·0	78·5	84·5	14	
91·5	†88·8	......	......	......	......	......	......	......	......	......	......	15	
......	†92·5	87·0	†89·5	90·0	90·5	†96·0	97·0	96·0	93·6	88·0	89·0	16	
82·0	86·2	84·5	85·8	85·0	91·0	90·0	90·0	90·3	91·0	86·0	81·7	17	
*120·7	†88·1	75·0	†85·7	105·0	†114·5	†105·3	†141·3	†161·0	(b)	†136·0	†64·7	18	
†66·3	†79·1	†48·0	†90·0	†96·0	100·4	95·5	†97·5	†112·2	†87·5	†80·7	98·3	19	
†52·3	72·0	90·0	†90·5	87·0	88·5	†90·6	†102·5	†116·0	96·0	94·5	85·5	20	
†85·6	81·5	80·0	103·0	113·2	†121·5	102·0	†104·0	†97·5	126·0	†122·7	†85·8	21	
87·0	†89·0	......	......	......	......	......	......	......	......	......	......	22	
......	†61·7	72·0	(b)	†79·8	†109·3	†49·5	†89·8	†75·9	†85·5	†75·9	†75·3	23	
†72·0	82·0	78·0	†80·0	†83·5	87·0	88·0	85·0	82·0	81·3	80·3	80·3	24	
†79·5	†70·7	†81·9	†83·0	88·0	88·0	88·5	87·5	†100·0	84·5	†81·5	81·5	25	
69·5	62·0	71·8	93·0	84·5	93·0	†93·0	97·5	†124·3	†81·7	†85·0	90·0	26	
73·5	†82·4	83·0	82·8	91·8	(b)	†80·8	†94·5	†88·5	†88·7	†95·3	†85·4	27	
†80·0	†67·0	†91·5	†89·5	†91·0	84·0	†86·3	†108·5	†103·6	†126·5	94·6	†91·7	28	
84·0	79·5	......	......	......	......	......	......	......	......	......	......	29	
......	†44·6	†106·0	†98·7	83·0	†86·3	91·0	89·0	†88·3	81·5	†93·5	91·5	30	
†72·0	82·3	†80·3	88·3	99·5	†126·5	†94·5	†76·7	77·5	†87·7	†85·6	†83·0	1	May.
†67·3	†55·5	†88·5	†87·7	86·0	97·5	90·0	†92·0	89·8	87·8	88·0	85·2	2	
†82·3	71·2	†79·1	†97·5	94·0	98·0	98·0	†88·5	88·0	87·0	86·8	88·0	3	
74·0	78·5	†85·7	72·7	82·0	†95·3	†94·3	105·5	98·7	†98·7	†61·0	†103·0	4	
82·5	83·0	85·0	88·0	86·8	87·4	88·2	87·0	86·3	86·5	86·6	84·0	5	
83·0	83·0	......	......	......	......	......	......	......	......	......	......	6	
......	†89·3	†85·0	†85·5	†87·8	†89·0	†97·0	†108·0	†105·7	93·7	86·1	97·8	7	
79·2	77·3	†97·1	†73·5	†92·3	†110·3	†118·9	†96·0	143·0	142·0	†65·7	91·2	8	
66·7	78·0	†86·8	82·5	92·2	94·0	93·5	97·3	†110·3	†114·8	87·8	85·4	9	
†91·6	85·6	82·8	97·7	95·0	89·8	109·5	100·2	137·5	†87·0	†81·6	93·5	10	
81·2	81·5	†83·7	†75·8	79·0	87·8	107·8	121·5	112·3	117·0	105·0	76·3	11	
†75·1	81·8	†92·6	90·0	86·0	92·0	87·5	†102·6	†101·3	†97·0	81·0	76·0	12	
85·6	68·0	......	......	......	......	......	......	......	......	......	......	13	
......	†44·4	80·3	73·3	100·5	(b)	119·0	†84·7	120·0	†100·2	(b)	†161·7	14	
83·5	81·5	82·0	91·0	76·0	75·0	†141·0	(b)	†163·5	†119·7	†127·5	122·8	15	
66·5	81·0	†93·3	62·5	95·0	86·5	104·5	107·8	139·0	†149·0	†106·0	†107·0	16	
†82·0	†72·7	89·0	80·0	86·3	105·5	107·2	94·0	86·5	82·5	90·8	83·0	17	
†77·3	†75·0	75·0	†89·0	†90·5	95·0	100·0	108·0	†95·6	†103·0	98·5	78·0	18	
74·2	81·5	82·0	†76·5	95·0	95·0	†88·0	†89·5	†102·0	†121·9	†88·1	90·3	19	
81·8	84·0	......	......	......	......	......	......	......	......	......	......	20	
......	78·5	80·0	81·5	78·3	90·6	†94·5	†103·5	†96·6	91·5	87·0	84·0	21	
73·0	75·0	†90·7	†80·0	82·5	86·8	111·7	87·5	87·1	86·0	†98·3	86·5	22	
72·0	89·6	†91·7	89·3	†86·3	†101·0	†102·0	†94·0	†91·5	88·0	87·0	84·9	23	
75·2	81·3	†70·0	90·0	64·5	†91·5	91·5	†64·0	(b)	†75·5	†76·5	†74·5	24	
85·0	72·0	56·2	73·0	89·5	118·0	89·5	107·0	120·0	110·0	85·0	82·0	25	
115·3	82·5	91·3	55·5	90·0	87·9	102·0	101·6	105·0	108·3	79·0	78·0	26	
78·0	78·5	......	......	......	......	......	......	......	......	......	......	27	
......	†87·0	†84·0	79·5	†81·7	85·0	88·3	116·9	†85·7	†100·3	†95·0	†86·5	28	
77·0	83·7	82·0	82·9	85·0	89·0	†107·5	95·0	98·0	90·5	89·5	85·0	29	
78·8	85·0	82·0	84·0	86·0	90·0	91·6	†109·0	88·9	87·5	90·4	80·0	30	
†86·0	75·2	94·0	84·0	93·5	85·0	103·4	91·0	85·0	†77·7	91·0	89·5	31	

† Magnet vibrating. (a) Off Scale West. (b) Off Scale East.

Point Barrow, 1854; Lat. 71° 21′ N. Long. 156° 15′ W. Magnetic Declination.
One Scale-division =2′·286. Increasing numbers denote increasing Easterly Declination.

Mean Point Barrow Time.	0h.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	8h.	9h.	10h.	11h.
D.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.
June. 1	84·7	78·2	81·0	83·0	81·5	80·3	79·5	83·7	85·5	91·5	84·7	78·3
2	89·3	87·3	86·5	83·3	81·5	82·0	83·5	84·7	78·3	81·3	82·7	81·7
3	87·0	82·0	85·3	†84·3	76·5	70·7	76·7	77·5	79·7	†79·3	82·0	83·5
4	......	......	......	......	......	......	......	......	......	......	......	......
5	81·5	80·0	84·5	82·0	†80·7	†85·0	96·3	92·0	88·2	88·0	94·5	84·5
6	78·7	82·5	†83·3	†84·7	†83·0	82·7	82·3	82·5	81·3	84·0	81·0	77·5
7	†81·3	78·0	83·0	86·5	77·0	76·0	78·3	84·5	85·5	82·0	85·0	†81·0
8	78·5	79·0	79·3	82·8	81·4	75·5	76·0	80·0	80·7	85·0	76·5	82·0
9	86·0	79·5	79·5	81·2	81·5	82·2	79·2	81·5	81·0	85·0	83·7	81·0
10	81·5	80·2	79·0	79·5	82·8	81·2	82·5	82·5	83·1	85·2	79·2	84·3
11	......	......	......	......	......	......	......	......	......	......	......	......
12	100·4	66·2	73·1	†80·9	77·0	†57·0	71·0	88·5	56·0	77·5	†94·2	†91·7
13	92·5	79·2	80·0	78·5	86·8	86·0	78·6	83·0	76·8	79·0	82·8	75·5
14	87·8	96·0	88·8	86·5	†84·7	82·8	85·5	75·2	82·2	83·0	84·5	84·0
15	†92·2	94·5	80·8	78·2	†79·9	81·0	76·5	83·0	79·5	†89·0	85·5	†70·3
16	†75·5	100·5	†86·0	†77·0	†83·0	†54·6	95·2	†86·3	55·0	†57·0	†61·8	†71·9
17	79·4	†71·7	84·0	80·5	78·8	83·0	81·0	83·2	82·5	†96·6	84·6	†86·4
18	......	......	......	......	......	......	......	......	......	......	......	......
19	85·0	83·5	†79·0	82·5	78·5	78·0	82·4	83·2	82·8	76·0	80·0	80·0
20	81·7	80·0	80·0	79·5	†82·5	79·0	†80·8	†80·5	85·4	84·8	†78·8	75·5
21	79·5	88·5	†73·8	77·5	78·0	80·4	80·2	83·5	83·0	†73·2	82·5	†75·0
22	90·0	86·5	76·0	79·0	84·0	86·5	82·0	79·0	84·0	†75·8	81·0	†82·6
23	78·0	82·5	75·0	†75·1	75·5	79·0	82·0	81·2	79·5	84·0	85·0	78·8
24	80·0	83·0	77·0	79·5	†77·6	80·0	80·8	81·0	83·0	84·7	81·2	80·0
25	......	......	......	......	......	......	......	......	......	......	......	......
26	89·5	80·0	83·5	87·0	78·0	80·2	78·5	82·0	84·0	70·0	†72·3	†56·7
27	83·0	82·0	81·5	80·5	†80·7	83·0	85·5	86·4	85·8	86·0	85·0	83·5
28	82·0	71·0	78·3	†75·7	†80·9	†79·5	†81·5	83·2	82·5	81·8	83·4	80·8
29	78·0	79·0	78·5	81·5	80·0	81·5	80·8	82·5	80·0	83·2	85·2	85·2
30	83·5	85·0	80·0	83·5	82·5	83·0	81·8	82·8	83·5	81·5	†84·7	†81·5

12h.	13h.	14h.	15h.	16h.	17h.	18h.	19h.	20h.	21h.	22h.	23h.	Mean Point Barrow Time.
sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	sc. div.	D.
80·0	92·5	72·0	83·5	92·7	93·7	95·0	†95·3	90·0	86·3	88·0	86·2	1 June.
84·0	78·0	73·5	†81·0	85·0	94·3	97·3	102·0	104·7	91·0	84·5	84·3	2
82·5	81·0	......	......	......	......	......	......	......	......	......	......	3
......	79·0	80·5	83·5	84·0	83·7	†82·5	85·0	83·5	84·6	80·6	81·3	4
81·5	81·5	89·0	92·0	99·0	†101·0	97·0	99·5	97·5	90·3	89·3	83·5	5
76·0	79·0	81·5	82·0	†84·0	92·8	92·5	114·0	104·7	93·5	82·0	†80·3	6
81·0	79·3	79·5	101·7	88·7	94·0	100·0	91·5	†93·0	89·3	84·0	81·0	7
83·2	†82·5	84·0	90·5	87·5	94·2	102·3	98·5	95·0	85·6	86·7	85·8	8
82·8	†79·6	82·5	85·5	†89·5	94·6	95·0	92·0	91·8	91·8	89·8	81·6	9
78·2	82·0	......	......	......	......	......	......	......	......	......	......	10
......	107·5	†84·8	85·2	†110·5	101·6	†100·4	†115·7	103·2	(a)	†78·5	78·5	11
†60·4	108·5	92·2	91·2	100·0	100·2	98·0	95·5	107·0	†99·5	†86·2	91·0	12
79·8	68·4	†81·6	86·6	96·5	87·5	87·2	†116·2	†100·7	88·5	86·5	82·2	13
86·5	80·0	†80·4	82·5	†83·3	116·8	†114·9	91·5	†114·3	†124·0	†100·5	74·5	14
95·5	77·8	82·3	†85·6	90·3	†102·0	†105·6	†132·6	†124·5	†101·4	†83·6	†73·1	15
75·5	87·0	†82·5	†83·5	†68·0	†120·4	†122·0	141·8	†148·1	†132·9	87·9	†80·8	16
81·3	†78·5	......	......	......	......	......	......	......	......	......	......	17
......	81·8	78·5	84·0	91·5	†91·6	87·0	†91·7	†91·6	†90·7	†90·0	82·5	18
71·0	†86·9	†82·3	89·8	90·0	94·5	98·0	96·7	96·0	†91·3	86·0	81·5	19
79·2	79·5	79·5	83·0	89·0	91·2	96·5	93·7	90·2	93·2	91·8	80·6	20
76·0	84·7	85·2	89·8	86·2	†93·3	93·0	93·3	93·5	95·8	98·0	99·0	21
†69·3	80·0	78·5	79·0	78·0	83·5	127·4	120·0	110·5	96·5	†85·0	84·6	22
†84·0	72·0	72·5	92·1	88·8	84·0	86·0	90·5	†97·3	91·6	84·3	82·2	23
82·5	78·2	......	......	......	......	......	......	......	......	......	......	24
......	82·3	72·5	82·5	85·3	90·0	90·5	92·0	†95·8	†91·5	†89·4	†89·7	25
85·4	79·0	†81·5	82·7	91·5	93·2	94·0	91·4	89·8	91·0	86·0	84·0	26
77·8	86·5	†82·4	79·2	†91·4	†92·5	91·5	†94·5	90·0	†93·0	89·0	87·5	27
65·7	58·1	60·6	82·5	84·2	90·0	†95·5	†101·5	†106·7	97·2	†86·6	83·2	28
81·5	72·0	94·0	87·2	†88·2	90·0	†90·0	†106·8	92·2	91·5	89·0	84·0	29
†79·5	......	......	......	......	......	......	......	......	......	......	......	30

† Magnet vibrating. (a) Off Scale East.