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KG
11366
v.664

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To reduce measures from gauge C, allow 0.011 inches for every eighth of an ounce, and add as follows:

Under 2 ounces	0.000	Under 13 3/4 ounces	0.003
" 5 7/8 "	0.001	" 17 5/8 "	0.004
" 9 7/8 "	0.002	" 21 1/2 "	0.005

Ar. co. log for reduction from gauge C 8.94575

Ar. co. log for reduction of snow measures:

With glass tube	1 7/8 inches across inside	9.79770
" " "	1 8/10 " " "	9.83315
" " "	1 13/16 " " "	9.82714

{Names of clouds on Poëy's system}	{Abbreviations used here}	
Cumulus	M	P is used to denote clouds which may be considered as either Pm or Pr.
Pallio-cumulus	Pm	
Fracto-cumulus	Fm	
Cirrus	R	
Pallio-cirrus	Pr	
Cirro-stratus	Rs	
Cirro-cumulus	Rm	

See book Q 5, p. 4, for further explanation.

Scale of wind

1	1 to 2 miles an hour
2	3 " 5 " " "
3	6 " 14 " " "
4	15 " 29 " " "
5	30 " 39 " " "
6	40 " 59 " " "
7	60 " 69 " " "
8	70 " 79 " " "
9	80 " 99 " " "
10	100 or more	

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Formulas from Mr. C. A. Schott's letter to Professor Winlock Jan. 10, 1873.

West declination of magnetic needle at Cambridge, Massachusetts (n denoting number of years after 1830)

$$+9°.58 + 2.69 \sin(1.3n - 19°.05) + 0.18 \sin(3.2n - 20°)$$

Annual increase of west declination

$$[8.7856] \sin(1.3n + 71°) + [8.0023] \sin(3.2n + 70°)$$

Date	Computed west decl.	Computed annual increase.
1850	10°.030	0°.0678
1860	10.672	0.0598
1870	11.214	0.0481
1880	11.627	0.0347
1881	11.66	
1882	11.69	
1883	11.72	
1884	11.75	
1885	11.784	0.0280
1890	11.901	

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January 1883

Date	Time G.M.	Barometer	Attached Thermometer	No. 4	Minimum before and after sets		Maximum before and after sets		Gauge	Rainfall in inches	Wind	Clouds
1	10¼	30.148	33.3	30.4	22.9	30.0	36.2	30.7	0¼	0.011	1 W	0 haze
2	10¼	30.308	27.8	18.7	11.5	17.7	34.4	20.0	0		0 S	1 P Rs haze
4	10	30.360	30.8	20.5	17.8	20.0	36.3	21.8	0		2 NW	2 Rs 7m →
5	10¼	30.345	19.8	6.0	1.8	5.3	22.0	8.0			2 N	10 R; snowing
6	10¼	30.156	20.8	12.3	5.3	11.5	12.7	13.0			2 N	10 R; snowing
7	10	29.675	20.4	16.9	10.4	15.3	16.4	16.8			0 W	10 R
8	10¼	30.074	26.0	20.5	9.1	19.9	30.3	21.2	Sup. ¼	0.896	2 NW	7 R R R
9	9¾	29.940	26.3	18.8	16.5	18.1	26.8	19.7	0		1 NW	5 R Rs
10	0¾	29.510	19.0	6.3	5.3	6.0	24.8	7.5			4 NW	10 R; snowing
11	10¼	29.798	18.0	10.0	5.2	9.4	10.8	11.0	See h. 5	0.200	2 N	9 R
12	10¼	30.152	out of sight; estimate 15.0	7.5	2.2	7.0	16.6	9.4	0		2 NW	0
13	10¼	30.232	18.0	17.5	−0.9	16.5	17.5	17.8	0		1 S	9 P 7m →
14	9½	29.648	31.2	37.8	16.3	36.7	38.3	36.5	2¼	0.199	1 S	10 P
15	9½	30.264	26.0	19.0	15.1	18.4	38.3	20.0	0		2 NW	0
16	10	30.456	24.8	18.1	17.0	17.2	26.0	19.0	0		1 NW	10 R
17	~~10¼~~	~~29.814~~	~~30.8~~								~~2 W~~	~~1 R 7m →~~
18	10½	29.864	30.8	35.4	9.3	34.8	35.0	35.0	4 5/8	0.408	2 W	1 Rs 7m →
19												
20	10	30.350	28.0	26.1	12.0	25.3	35.4	26.3	1½	0.132	1 N	10 P
21	9¾	29.464	33.0	36.7	25.2	36.0	36.3	36.0	8½	0.750	2 SW	10 P
22	9¾	30.410	23.0	13.9	11.6	13.2	42.2	15.2	0		4 W	5 P 7m →
23	10	30.241	out of sight; estimate 13.0	2.4	−1.0	2.0	15.5	5.0	0		2 W	0
24	10½	30.411	18.0	9.8	1.3	9.0	11.2	11.7	0		2 W	1 R
25	10	30.207	32.9	24.2	9.1	23.6	26.0	25.7	0		2 NW	10 R
26	10½	30.396	20.8	12.8	5.6	12.1	26.0	14.0	0		1 N	0
27	9¾	30.088	24.1	27.7	11.8	26.9	27.3	27.4	0		2 S	10 P
28	9¾	29.936	31.6	34.7	26.7	34.0	36.7	34.2	1⅛	0.099	0 calm	10 P fog; some rain
29	9¾	29.992	32.9	31.5	30.9	30.9	35.5	31.3	1¾	0.154	2 N	10 P; a few snowflakes
30	9¾	30.082	31.7	30.1	27.8	29.3	32.0	30.0	0⅛	0.011	1 NW	10 P
31	10	29.993	34.0	35.6	28.0	34.9	35.3	35.4	0		2 SE	10 P 7m ↑
	10.0	842.132 30.076 +.008 30.084	711.0 35.4	580.2 20.7	353.8 12.6	561.0 20.0	781.8 27.9	Max. set inside building	Sea 1/1.4,6.	2.860 Rainfall for month 2.86 inches.	46 1.6	180 6.4

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Date	Time P.M.	Barometer	Attached Thermometer	No. 4	Wind	Sclerometer	Time P.M.	Zodiacal Light	Time P.M.	Aurora	Report of Signal Service
1	7 3/4	30.156	33.8	24.3	1 W	2 Phaze	7 3/4	Visible	7 3/4	None	None
2	8	30.341	31.4	24.0	1 NW	0	8	Distinct	8	None	None
3	7 3/4	30.021	33.9	32.2	2 SW	0 haze	7 3/4	Distinct	7 3/4	None	None
4	6 3/4	30.348	27.1	13.1	1 N	2 Phaze	6 3/4	Visible	6 3/4	None	None
5											Obsc.
6											Obsc.
7	8 1/4	29.858	26.3	27.3	2 SW	0	8 1/4	Distinct	8 1/4	None	None
8											Obsc.
9											Obsc.
10											Obsc.
11	9 3/4	29.913	20.9	11.0	0 NW	5 Phaze	9 3/4	Hazy	9 3/4	Hazy	None
12	7 1/2	30.353	20.4	7.8	1 NW	0	7 1/2	Moonlight	7 1/2	Moonlight	None
13											Obsc.
14	8 1/2	29.948	31.8	24.7	1 SW	0	8 1/2	Moonlight	8 1/2	Moonlight	None
15	7 3/4	30.368	30.3	20.5	1 SW	1 Rs	7 3/4	Moonlight	7 3/4	Moonlight	None
16	9	30.406	27.2	16.5	0 calm	0	9	Moonlight	9	Moonlight	None
17											Obsc.
18	8 1/2	30.265	33.6	26.3	1 N	0 Rs	8 1/2	Moonlight	8 1/2	Moonlight	None
19											Obsc.
20											Obsc.
21											Obsc.
22	8	30.170	23.3	8.6	2 W	6 Pt Rm 7m	8	Cloudy	8	Moonlight and clouds	None
23	8 1/2	30.316	20.3	4.8	1 W	0	8 1/2	Moonlight	8 1/2	Moonlight	None
24											Obsc.
25	8 1/2	30.344	27.4	16.7	1 NW	1 Pt Rs	8 1/2	Moonlight	8 1/2	Moonlight and clouds	None
26	7 1/2	30.331	27.3	18.9	0 calm	1 haze	7 1/2	Distinct	7 1/2	None	None
27											Obsc.
28											Obsc.
29											Obsc.
30	7 3/4	30.193	35.3	29.7	0 S	0 haze	7 3/4	Distinct	7 3/4	None	None
31	7 1/2	29.783	36.7	31.6	1 SW	1 Phaze	7 1/2	Distinct	7 1/2	None	None

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January 1883.

1, 11½ A.M. Barom. 30.200; attached therm. 34.1; No. 4, 29.3; minimum 26.2 (not set); maximum 36.2 (not set); gauge 0; wind 2 NW; clouds 0. Last night at midnight zodiacal light apparently visible to near the Pleiades.

2, 10½ A.M. Yesterday mostly clear and cold; thin clouds after 8 P.M.; no aurora seen; zodiacal light easily visible early in the evening.

2, 11¾ P.M. Day and evening clear, rather cold; no aurora seen; zodiacal light not now perceptible; it was visible after 9 P.M.

3, 10¾ P.M. Day mostly clear, but partly cloudy; evening rather clear; no aurora seen.

5, 10¼ A.M. Yesterday cold and rather clear; evening rather hazy, with variable cloudiness, increasing on the whole; no aurora seen.

6, 10¼ A.M. Yesterday cloudy and cold day and evening, with a little light snow.

7, 10 A.M. Yesterday cloudy day and evening with some drizzle.

8, 10¼ A.M. Yesterday cloudy, clear towards night, rather cloudy after 10 P.M.; no aurora seen. Snow this morning measured in 5 places; 5¾, 5½, 5½, 5, 5¾; mean 5.50 inches; 17 inches in cylinder 1 13/16 inches across weigh 4⅛ ounces; 8.7696 9.2121 / 0.6154 0.7404 / 9.8271 9.9525 hence rainfall to 1 inch of snow 0.1630 inches; total rainfall 0.896 inches. Gauge 1½ ounces (0.132 inches) being doubtless only the light snow of Jan. 5; the snow of Jan. 6 was fine and compact.

9, 9¾ A.M. Yesterday clear and cool; evening cloudy.

10, 9¾ A.M. Yesterday rather clear at first; afternoon and evening cloudy.

10, 5½ P.M. Day cloudy and cold with strong north wind and snow; barom. 29.474; attached therm. 18.6; No. 4, 9.9.

11, 10¼ A.M. Yesterday cloudy and cold day and evening.

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11, 10½ A.M. Snow of yesterday too much drifted and confused with previous snow for any measurement; there may be some 2 inches of new snow; rainfall day 0.200 inches.

11, 11½ P.M. Day cold, somewhat cloudy; evening rather cloudy and hazy till 9½ P.M., afterwards clearer; now rather clear with clouds in the north; no aurora seen; band from Pleiades visible; a little zodiacal light suspected lower down.

12, 11½ P.M. Day and evening clear and cold; no aurora seen; band from Pleiades does not appear this evening to widen out lower down as yesterday at this time; but about the time when the moon was setting, the zodiacal light seemed to be visible.

14, 9½ A.M. Yesterday cold at first, becoming warmer and more cloudy; some rain in the evening.

14, 11 P.M. Day cloudy and thawing at first, becoming clear and colder in the afternoon; evening clear, no aurora seen.

15, 10½ P.M. Day and evening clear, rather cold; no aurora seen. Illumination of atmosphere in conical form below moon noticed yesterday and today.

17, 3¾ A.M. Yesterday cloudy at first, afternoon and evening clear and cold; no aurora seen. Illumination of atmosphere by moon as previously

17, 11½ A.M. Barom. 30.234; attached therm. 24.3; N.4, 23.8; minimum 9.2, not set; maximum about 24, not set; gauge 0.2; wind 0, calm; clouds 10 P2 fog. It clouded up about 4 A.M. today.

18, 10½ A.M. Yesterday cloudy with snow about 3 P.M., followed by rain after dark.

19, 12¾ A.M. Yesterday clear and cool day and evening; no aurora seen.

19, 11¾ A.M. Barom. 30.432; attached therm. 26.4; N.4, 24.0; minimum 12.0, not set; maximum 35.4, not set; gauge 0; wind 1W; clouds 10P.

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January, 1883.

20, 10 A.M. Yesterday cloudy day and evening, with a little snow; about 1½ inches of light new snow on the ground this morning; record of gauge considered good, as there was little wind yesterday.

21, 9¾ A.M. Yesterday cloudy, with rain towards night.

22, 9¾ A.M. Yesterday cloudy and thawing; windy and cooler towards night; evening cloudy.

22, 11 P.M. Day and early evening rather cloudy and cold; clear before 9 P.M. and afterwards; no aurora seen; No. 4 now 5.8.

23, 3½ A.M. No. 4 now 3.0. Clear; no aurora seen.

23, 10½ P.M. Day clear and cold; no aurora seen; No. 4 now 4.2.

25, 10 A.M. Yesterday clear at first, growing cloudy; evening cloudy.

25, 11¾ P.M. Day rather cold, somewhat cloudy; evening rather clear, with thin clouds; no aurora seen.

26, 10½ P.M. Day clear, rather cold; evening mostly clear, with some haze and after 10 P.M., thin clouds from the west; no aurora seen.

28, 9¾ A.M. Yesterday cloudy, becoming warmer, with a little rain; evening cloudy.

29, 9¾ A.M. Yesterday cloudy day and evening, with some rain.

30, 9¾ A.M. Yesterday cloudy day and evening with a few snow flakes.

30, 10 P.M. Day cloudy at first, rather clear towards night with some haze, increasing after 8 P.M., now pretty thick; no aurora seen.

31, 5¼ P.M. Day cloudy and rather warm, with rain. Gauge now 4½ ounces; 0.397 inches.

31, 7½ P.M. During the last half hour there have been perceptible variations in the brightness of the zodiacal light relatively to the Milky Way, but probably not more than might well be explained by the presence of thin masses of haze. At 6¾ P.M., the zodiacal light near δ Piscium, about three

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altitude of γ Pegasi, was apparently as bright as the Milky Way at the same altitude (the bright part about half way from β Cassiopeiæ to α Cygni). Afterwards it was certainly much fainter, at that altitude, and equal ~~at~~ to the same part of the Milky Way only at the altitude of α Pegasi. But it nearly recovered its previous brightness towards the end of the half hour. The sky had recently cleared, and there were occasional clouds from the west, some of the visible being very light and thin; there may have been others not visible as clouds. It was also certain this evening that a distinction could be made between an inner and an outer zodiacal cone (the stronger and diffuse light of Jones). The north edge of the inner cone lay approximately on the line γ and ε Piscium; that of the outer $\frac{2}{3}$ of the way from this line to the line γ and α Pegasi. The width of the inner cone was about equal to the interval between these two northern edges, and the outer cone extended not over half as far beyond it on the southern side. During the half hour there were frequent faint flashes, apparently due to distant lightning, in the northern sky.

31, 10¾ P.M. Evening mostly clear; no aurora seen; Zodiacal light at 9 P.M. not extending to a greater elongation than at 7½ P.M.

Report to Signal Service, sent Feb. 1, 1883.

Aurora looked for every clear evening; none seen.

Zodiacal light distinct Jan. 2, 3, 7, 26, 30, 31; visible also Jan. 1, 4; Observations on other evenings hindered by moonlight or clouds. Zodiacal light in the west suspected about midnight (beginning) of Jan. 1; also Jan. 11, 11½ P.M. and Jan. 12 at setting of moon.

Lightning without thunder Jan. 31, 6¾ to 7¼ P.M. (faint flashes towards northwestern horizon, seemingly due to distant lightning).

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February 1883.

Day	Time A.M.	Barometer.	Attached thermometer	No. 4	Minimum before and after setting		Maximum before and after setting		Gauge	Rainfall in inches	Wind	Clouds
1	9½	30.002	33.2	26.7	25.6	26.1	42.5	27.2	See p. 6	0.397	1 W	1 M 7m Rs R
2												
3	10	30.449	28.7	24.4	12.6	23.6	30.1	25.2			1 E	10 R; snowing
4	9½	29.890	28.4	22.6	17.4	22.1	32.2	23.2	See p. 10	1.178	1 W	10 P; a little mist
5	9½	30.218	30.1	23.9	21.1	23.0	41.6	24.5	0		0 S	10 R
6	10	30.359	26.2	15.3	8.2	14.4	29.8	17.0	0		1 SW	0 Rs
7									See p. 11	0.656		
8	10¼	30.033	30.2	22.7	14.6	22.1	40.1	24.0	0¼	0.022	2 SW	0
9	10	30.196	26.3	25.5	17.3	24.8	28.0	26.3	0		2 SW	1 Rs 7m
10	9¾	30.556	25.0	10.2	9.1	9.8	33.6	12.0	0		2 N	0
11	9¾	29.988	27.4	21.6	9.4	21.0	27.3	22.0			1 N	10 R; snowing
12	10¼	30.098	31.7	31.5	20.4	31.0	32.3	32.0	See p. 12	0.796	3 NW	4 M 7m
13	9½	30.412	20.0	15.8	10.3	15.0	32.0	16.8	0		0 calm	0
14	10	30.111	23.8	25.8	10.4	25.1	30.2	26.2	0		1 SW	6 P
15	9¾	30.264	31.5	20.7	20.2	20.2	27.3	22.0	-		3 NE	10 R; snowing
16	9¾	30.270	29.0	28.3	18.0	27.4	28.0	28.1	2½	0.221	0 NW	10 P; a little mist
17	9½	29.846	36.0	45.1	27.4	43.9	45.6	42.8	0¼	0.022	2 SW	10 P fog
18	9½	30.354	35.5	24.3	23.3	23.8	51.9	25.3			1 N	10 R; snowing
19	9½	30.292	27.4	21.4	10.8	20.5	28.5	22.8	1	0.088	2 SW	9 R Rs
20	9½	30.320	30.5	21.8	17.2	20.8	32.0	22.0	0		1 W	9 R 7m
21	9¾	29.708	33.0	28.8	20.6	28.1	33.5	29.2	0¾	0.066	3 W	5 M 7m
22	9¾	29.838	29.3	28.8	18.1	28.1	29.5	29.0	0		2 SW	10 R
23	9¾	30.149	32.2	23.0	21.2	22.3	38.0	23.6	0		2 N	10 R; a few snowflakes
24	9¾	30.666	18.0	14.3	5.1	13.6	27.2	15.4	0		1 NW	0
25	10	29.914	31.6	38.0	13.4	37.0	37.4	36.5	2¾	0.243	2 S	10 P; raining
26	9¾	29.784	33.4	32.1	27.1	31.8	43.2	32.3	1	0.088	3 W	9 P M 7m 10 7m
27	9¾	30.058	out of instrument 15.0	11.3	10.0	10.6	32.4	12.7	0		3 NW	2 R Rs 7m
28	10	29.876	26.3	27.8	10.6	27.1	27.8	27.9	0¾	0.066	2 W	9 P M 7m
	9.8	783.675	739.7	621.7	419.4	613.2	882.0	Mercury set outside building	See pp. 6, 10, 11, 12	3.843 Rainfall in month 3.84 inches	42 1.4	165 6.8
		30.141 +001 30.142	28.4	24.3	16.1	23.6	33.9					

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February 1883.

Date	Time P.M.	Barometer	Attached thermometer	No.4	Wind	Clouds	Time P.M.	Zodiacal light	Time P.M.	Aurora	Report to Signal Service.
1											Aurora
2											Obsc.
3											Obsc.
4											Obsc.
5	7 3/4	30.100	32.1	26.1	3 W	0	7 3/4	Distinct	7 3/4	None	None
6			~~30.0~~								Obsc.
7	9 1/4	29.824	33.9	28.2	2 W	0	7 3/4	Distinct	9 1/4	None	None
8	7 1/2	30.098	28.9	22.9	2 SW	0	7 1/2	Distinct	7 1/2	None	None
9	7	30.120	33.9	28.3	1 SW	0	7	Visible	7	None	None
10											Obsc.
11											Obsc.
12	8 1/2	30.375	28.7	22.3	1 SW	0	8 1/2	Moonlight	8 1/2	Moonlight	None
13	8	30.293	29.4	22.1	1 SW	0	8	Moonlight	8	Moonlight	None
14											Obsc.
15											Obsc.
16											Obsc.
17											Obsc.
18	8	30.374	33.7	21.7	1 W	0	8	Moonlight	8	Moonlight	None
19	8 1/2	30.241	33.8	26.3	1 SW	0	8 1/2	Moonlight	8 1/2	Moonlight	None
20											Obsc.
21	8 1/2	29.871	28.9	21.8	2 W	0	8 1/2	Moonlight	8 1/2	Moonlight	None
22	10	29.825	35.4	32.2	1 N	10 P	10	Cloudy	10	Cloudy	Obsc.
23	8 1/4	30.149	26.7	17.0	2 NW	0	8 1/4	Moonlight	8 1/4	Moonlight	None
24	8 1/2	30.506	29.7	24.4	2 SE	8 Phuze	8 1/2	Cloudy	8 1/2	Cloudy	Obsc.
25	9	29.590	37.4	34.8	3 W	0	9	Distinct	9	None	None
26	8 1/4	29.874	28.7	23.1	2 NW	0	8 1/4	Distinct	8 1/4	None	None
27	8	30.138	20.1	12.8	2 NW	0	8	Distinct	8	Broad arch	Aurora
28	10 1/4	30.291	25.8	16.2	0 NW	0 Rs	10 1/4	Visible	10 1/4	Diffused light	Aurora

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February, 1883.

2, 12½ A.M. Barom. 30.348; attached therm. 29.1; No. 4, 16.5. Yesterday clear, becoming rather windy and cold; Zodiacal light distinct early in the evening; auroral arch as early as 7 P.M., still continuing; partly broken with short streamers about 10½ P.M.

2, 1¾ A.M. Auroral arch continues.

2, 11 A.M. Barom. 30.609; attached therm. 26.3; No. 4, 18.1; minimum 12.6 (not set); maximum 30.0 (not set); gauge 0; wind 3 NW; clouds 2 P₂R₂.

3, 10 A.M. Yesterday rather cold with increasing cloudiness; evening cloudy. Snow fallen up to this time about 2 inches.

3, 5 P.M. Snow till about noon, followed by sleet and freezing rain, still continuing. Depths of snow by measures at 4¾ P.M.: 3½, 3, 3¼, 3½, 3¾; mean 3.4 inches; 17½ inches in cylinder 1 13/16 inches across weigh 7½ ounces. Hence rainfall to 1 inch of snow

9.827 14 9.45916
8.7576 96 9.52148
0.875 06 9.99064

0.2878 inches; total rainfall 0.979 inches. Gauge 6½ ounces; 0.574 inches; direct measure preferred.

4, 9½ A.M. Yesterday evening cloudy; some rain and sleet. Gauge now 2¼ ounces; 0.199 inches; sum of this and 0.979 above 1.178 inches.

5, 9½ A.M. Yesterday cloudy, thawing part of the day; some stars visible in the evening.

5, 11 P.M. Day at first cloudy, becoming clear and rather cold; evening clear; no aurora seen; Gegenschein not perceptible; bands in this region of sky as usual.

—

7, 10¾ A.M. Barom. 29.428; attached therm. 30.7; No. 4, 34.7; minimum 14.6 (not set); maximum 34.5 (not set); wind 1 S; clouds 10 P; raining. Yesterday clear at first, becoming cloudy; evening cloudy; snow before morning, followed by rain. Measures of snow at 10¼ A.M. today: 2½, 2¼, 2, 2¼, 2½; mean 2.30 inches; 19½ inches in cylinder

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$1\frac{13}{16}$ inches across weigh $8\frac{3}{4}$ ounces; 9.827 1 4 9 4 7 9 1 2 / 8.709 9 7 6 3 6 1 7 3 / 0.942 0 1 9 8 4 0 8 5 hence rainfall to 1 inch of snow 0.3014 inches; total rainfall 0.693 inches. New snow wet and heavy; crust over old snow, so that new snow could be distinguished from old. Rainfall by gauge 7 ounces; 0.618 inches; probably little wind last night, in which case the gauge may be as trustworthy as the measures; mean of both 0.656 inches.

7, $11\frac{3}{4}$ P.M. Day at first cloudy with rain; clearing off about noon with strong west wind; evening clear; no aurora seen; no Gegenschein apparent; bands of the region of Leo as usual.

8, $11\frac{1}{2}$ P.M. Day clear and cool; evening clear; no aurora seen. Meteor equal to Arcturus at $11^{h}\,55^{m}$ P.M.; reddish, with train; from near Coma Berenices, passing between α and γ Leonis. Region of Leo examined 11 to $11\frac{1}{2}$ P.M.; the band from Praesepe to σ Leonis seemed to have a faint extension on the following side, reaching to the line from ε to γ Leonis; region immediately preceding α Leonis dark; if the appearance of light is assumed to be Gegenschein, the centre may be placed on the line from σ Cancri to γ Leonis, at a distance from σ Cancri half as great as that from σ Cancri to γ Leonis. This is approximately $9^{h}\,20^{m}$, +18°.0.

9, $10\frac{3}{4}$ P.M. Day clear and cold; evening clear till 10 P.M.; afterwards thin clouds at times; region of Leo pretty clear about $10\frac{1}{2}$ P.M.; appearance as yesterday; nothing certain, except that near α Leonis the sky is still dark as compared with the ordinary bands of the region. Zodiacal light visible before moon set; afterwards distinct.

11, $9\frac{3}{4}$ A.M. Yesterday clear, cold; cloudiness increasing towards night; evening cloudy; clouds thin, becoming thicker. Snow this

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February, 1883

morning 5 or 6 inches deep, light.

11, 4 P.M. A few drops of rain at times. Gauge cleared out. Snow measured 5½, 5½, 5, 5¾, 5¼; mean 5.40 inches. 20½ inches in cylinder 1 13/16 inches across weigh 4 ounces; hence
9.82714 9.11745
8.68125 0.73269
0.60206 9.84984
rainfall to 1 inch of snow 0.1311 inches; total rainfall 0.708 inches.

12, 10¼ A.M. Yesterday evening cloudy; a little rain. Gauge this morning 1 ounce; 0.088 inches; this added to measure yesterday makes 0.796 inches.

12, 11 P.M. Day clear and cool; evening mostly clear; no aurora seen; thin clouds in the west coming on after 10 P.M.

13, 11¼ P.M. Day clear and cool, with some thin clouds; evening clear; no aurora seen.

15, 9¾ A.M. Yesterday cloudy, clouds thickening; a little snow in the evening; snowing this morning; about 1½ inches of new snow.

16, 9¾ A.M. Yesterday cloudy day and evening with a little snow and sleet; this morning somewhat warmer, with mist; as the snow has not been attended by much wind, the measure of rainfall by the gauge is adopted.

17, 9½ A.M. Yesterday misty and foggy day and evening.

18, 9½ A.M. Yesterday foggy at first, then clear; cloudy again after about 6½ P.M. About an inch of new snow now on the ground.

18, 10½ P.M. Cleared off in middle of day; evening clear; no aurora seen.

19, 10¼ P.M. Rather cloudy at first; clear afterwards; no aurora seen; clouds from the northwest about 10 P.M.

20, 9½ A.M. A few snowflakes last night.

21, 9¾ A.M. Yesterday rather cloudy; a little snow in the evening.

21, 11 P.M. Day mostly clear, rather cold; evening clear; no aurora seen.

22, 10 P.M. Day rather cloudy. evening cloudy; thawing.

23, 10 P.M. Day at first cloudy, with a few snowflakes.

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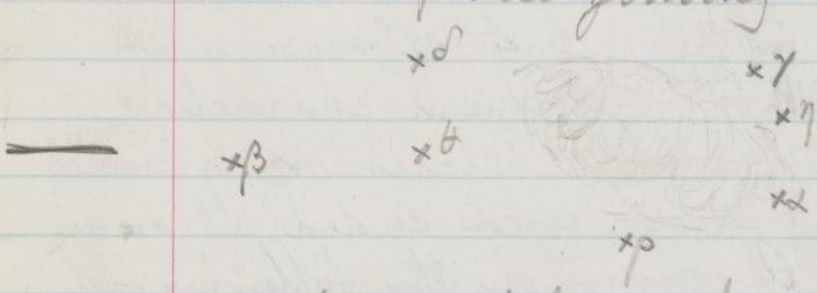
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soon clear; evening clear, rather cold; no aurora seen; Zodiacal light distinct before moon rose.

23, 11½ P.M. No aurora seen; clear.

25, 10 A.M. Yesterday clear and cool; evening hazy, haze thickening to clouds.

25, 9¼ P.M. Day cloudy and thawing with rain; clearing off about 8½ P.M. Sky still rather hazy, but bands about Hydra discernible. Gegenschein suspected; estimated centre ⅓ of the distance from α Leonis to middle of line joining δ & θ Leonis. Appearance somewhat as in sketch; dark space preceding α Leonis; light in Leo nearly or quite equal to that of band below; band from Praesepe to ο Leonis did not seem to extend as much toward the line from η to ε Leonis as on Feb. 8.



α Leonis	10h 2m.0	+12° 3′	Gegenschein ~~10h 3m.1~~ +15° 36′
δ "	11 7.7	+21 11	10h 23m.9 + 14° 35′
θ "	11 7.9	+16 5	

11 7.8 18 3.8
10 2.0 12 3.3
5.8 6.5
21.9 2.5

26, 9¾ A.M. Yesterday evening continued clear; no aurora seen.

26, 10¾ P.M. Day mostly clear and windy, becoming cold; evening mostly clear; some clouds now in the north and west; no aurora seen; too much moonlight now for Gegenschein.

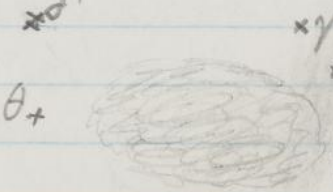
28, 10 A.M. Yesterday mostly clear and cold; auroral arch in the evening; clouds increasing after 8 P.M.; cloudy about 10½ P.M.; some snow later.

28, 10½ P.M. Day cold and windy, somewhat cloudy; evening clear; diffused auroral light seen; some clouds in the north; zodiacal light somewhat visible as late as 10 P.M.; Gegenschein strongly

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suspected on first looking at Leo; the impression rather weakened than confirmed by long looking, but renewed on looking up again after turning away; centre estimated 0.4 of the way from α to β Leonis; appearance somewhat as below, but difficult to determine, on account of failure to increase in distinctness by observation; it seemed at least as bright as the band between Leo and Septans, but of more uniformly diffused character; it did not seem to reach α Leonis on the preceding side, and ended at some distance from θ Leonis on the following side.



Position $10^h 28^m.3$, + ~~14°~~ 8'. 13° 58'.

α 10 2.0 +12 33
θ 11 7.9 +16 5
G 10 28.4 +13 58

Report to Signal Service, sent March 2, 1883.

Aurora — looked for every clear evening: Feb. 1, auroral arch as early as 7 P.M., partly broken with short streamers about 10½ P.M.; arch still continuing at 1¾ A.M. of Feb. 2; Feb. 27, broad arch visible at 8 P.M. and later; Feb. 28, diffused auroral light as early as 10 P.M.

Zodiacal light — distinct Feb. 1, 5, 7, 8, 9, 23, 25, 26, 27; still visible at 10¼ P.M. Feb. 28. Observations on other evenings hindered by moonlight or clouds.

Meteor — equal to Arcturus in brightness, Feb. 8, $11^h 15^m$ P.M.; reddish, with train; from near Coma Berenices, passing between α (Alpha) and η (Eta) Leonis.

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March, 1883.

Day	Time P.M.	Barometer	Attached Thermometer	No 4	Minimum Before and after all night		Maximum Before and after all night		Gauge	Rainfall in inches	Wind	Clouds.
1	10	30.344	22.7	22.3	11.2	21.7	29.2	23.0	0		1 W	0 P
2	10	29.744	34.0	41.1	21.4	40.2	40.6	40.2	0		2 SW	8 Pz 7m →
3	9½	30.011	32.7	23.8	21.7	23.0	50.7	24.8	0		2 NW	2 P Rs
4	9½	29.974	19.9	12.8	7.2	12.2	26.0	14.2	0		2 NW	0 P 7m
5	10	30.226	out of high thermometer 15.0	7.9	4.1	7.3	23.0	9.2	0		2 W	0 7m
6	9½	30.326	20.7	18.3	6.0	17.8	19.0	19.2	0		1 S	6 P hazy
7	10	29.590	29.6	30.4	17.7	30.0	31.0	30.5	See p. 20	0.515	4 W	0 M 7m
8	10	30.263	20.2	8.9	3.5	8.2	30.6	10.0	0		2 W	0 Rs
9	10½	30.160	17.6	17.0	1.6	16.3	17.8	18.0	0		1 W	0
10	9¾	29.618	28.0	31.8	16.2	34.1	34.6	34.4	0		2 E	10 P
11	9¾	29.319	32.2	35.7	30.3	35.1	35.6	35.1	See p. 22	0.761	3 SW	1 M 7m
12	9¾	29.994	20.2	15.4	10.1	15.1	See p. 22 32.6	16.7	0		2 W	0
13	10¾	29.723	30.7	33.1	14.9	32.5	33.0	33.0	0		3 SW	5 M 7m
14	10½	29.586	28.4	31.8	14.0	31.0	34.7	31.8	0		2 S	3 P Rs
15	9½	29.320	37.1	47.2	31.0	46.3	46.8	46.3	0		2 SW	2 Phaze 7m
16	9½	29.664	27.5	17.7	16.5	17.0	50.6	18.9	0		4 NW	2 M 7m
17	9¾	29.856	27.1	28.5	12.3	27.9	28.5	28.7	0		3 SW	7 P 7m →
18	9½	29.702	35.6	43.7	28.0	42.6	43.2	42.8	0		3 S	5 R Rs
19	9½	29.917	40.0	38.5	35.0	37.7	54.0	38.5	0		3 NE	6 P 7m / 7m /
20	9½	29.425	38.8	38.7	27.6	38.2	46.4	38.8	6⅜	0.563	1 W	10 Rn
21	9¾	29.783	30.0	23.4	18.4	22.9	39.1	24.2	0		1 NW	0 Rs
22	9½	29.874	22.0	20.7	14.2	20.1	31.4	21.2	0		2 NW	0
23	9½	29.875	27.2	26.1	14.9	25.3	28.7	26.5	0		1 NE	9 Pz M
24	9¾	29.631	27.5	27.4	15.8	26.9	31.3	28.0	0		3 NW	0
25	9½	29.926	29.8	33.5	22.0	33.2	33.2	33.2	0		2 NW	0
26	10	29.904	35.7	43.0	28.1	42.2	43.0	42.4	0		3 NE	1 Rs
27	10	29.790	39.1	38.1	35.6	37.7	45.5	38.1	0⅛	0.011	2 NE	10 Rn 7m
28	9½	29.679	36.6	37.2	33.0	36.5	39.4	37.3	1¼	0.110	3 NW	0 7m
29	9½	29.934	32.1	28.8	22.3	28.3	40.2	29.5	0		2 NW	1 Rs
30	10	29.807	32.8	32.2	21.6	31.4	36.7	32.1	0		1 N	10 P
31	9¾	29.856	32.2	33.4	21.2	33.0	36.6	33.5	1	0.088	2 N	8 Rn
	9.8	29.874 29.524	905.0 29.2	891.4 28.8	577.4 18.6	871.7 28.1	1112.7 35.9	Max. set inside building	See pp. 20, 22.	2.048 Rainfall for month 2.05 inches	67 2.2	98 3.2

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March, 1883.

Date	Time P.M.	Barometer	Attached Thermometer	No. 4	Wind.	Clouds	Time P.M.	Zodiacal Light	Time P.M.	Aurora	Report to Signal Service
1	8¼	30.179	32.3	28.4	1 SW	0 Rs	8¼	Distinct	8¼	None	Aurora
2	10	29.918	40.5	35.8	2 NW	5 P Fm	8	Distinct	10	None; some clouds	Aurora
3	11½	29.988	29.4	16.8	2 NW	0 P Fm	11½	None	11½	None; some clouds	None
4	9¼	30.019	25.1	14.0	2 NW	0	9¼	Visible	9¼	None	Aurora
5	8¼	30.318	29.1 Attached Thermometer 15.0	10.3	1 W	0	8¼	Distinct	8¼	None	None
6											Obs.
7	8½	29.960	26.2	17.1	2 SW	0	8½	Distinct	8½	Slightly suspected	Aurora
8	9	30.154	20.3	10.7	1 W	0 P	9	Distinct	9	Light over clouds and faint streamers.	Aurora
9	8¼	30.094	29.5	22.2	1 S	0	8¼	Distinct	8¼	None	None
10	10¼	29.164	32.2	31.1	2 W	2 haze	10¼	Hazy	10¼	None	None
11	8½	29.559	34.8	22.3	3 W	0 P	8½	Moonlight	8½	Moonlight	None
12											Obsc.
13	9	29.927	30.8	25.1	0 calm	5 Pm Fm →	9	Moonlight	9	Moonlight	None
14	9	29.537	36.6	37.2	2 S	7 P Rs Fm →	9	Moonlight and clouds	9	Moonlight and clouds	None
15	8¼	29.532	41.0	31.2	3 NW	2 Rs	8¼	Moonlight	8¼	Moonlight	None
16	8¼	29.806	27.9	19.4	2 W	0	8¼	Moonlight	8¼	Moonlight	None
17	8¼	29.782	35.7	33.1	2 SW	10 Rm Fm →	8¼	Cloudy	8¼	Cloudy	Obsc.
18	8½	29.705	42.7	44.9	2 SW	0	8½	Moonlight	8½	Moonlight	None
19											Obsc.
20	8½	29.629	34.3	23.9	3 NW	10 Rm	8½	Cloudy	8½	Cloudy	Obsc.
21	8¾	29.809	33.2	23.5	2 NW	2 Rs	8¾	Moonlight	8¾	Moonlight	None
22	9¾	29.919	30.1	21.2	0 calm	2 Rs	9¾	Moonlight	9¾	Moonlight	None
23	11½	29.846	29.6	19.7	0 calm	0	11½	Moonlight	11½	Moonlight	None
24	8¼	29.900	31.7	27.9	1 NW	0	8¼	Moonlight	8¼	Moonlight	None
25	7½	29.858	37.6	35.9	2 NW	0	7½	Visible	7½	None	None
26											Obsc.
27											Obsc.
28	8	29.810	37.7	32.9	2 NW	0	8	Distinct	8	None	Aurora
29	8¼	29.902	37.1	31.3	0 calm	0	8¼	Distinct	8¼	None	Aurora
30	8½	29.749	35.8	28.0	0 NW	1 P haze	8½	Distinct	8½	None	None
31	11	29.928	38.7	29.8	1 N	5 P Rs haze	11	Cloudy	11	None	None

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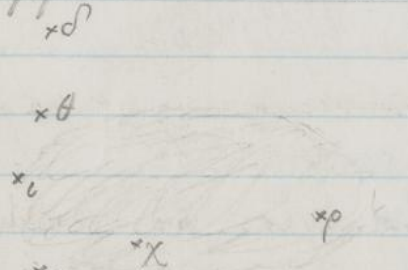
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March, 1883.

1, 11 P.M. Day rather clear and cold; clouds at times; evening mostly clear; now somewhat hazy; bands in region of Leo too indistinct to allow of observation of Gegenschein; but some suspicion of it, as also earlier, about 8 P.M. when Leo was too low for good observation. Light, apparently auroral, among clouds in the north.

2, $10\frac{3}{4}$ P.M. Day mostly warm and rather clear; evening partly clear, but hazy and with occasional clouds; no aurora seen. { Auroral light among clouds seen by E.C.P. and O.C.W. about $11\frac{3}{4}$ P.M.

3, $11\frac{1}{2}$ P.M. Day mostly clear, growing colder; thin clouds coming on early in the evening; cloudy at about 8 P.M.; clear at $11\frac{1}{2}$ P.M.; Gegenschein tolerably apparent; bands about Hydra, Leo, and Sextans well visible; Gegenschein brighter than band below; but limits indefinite; centre estimated half way from ρ to ι Leonis; appearance somewhat as below: sky preceding



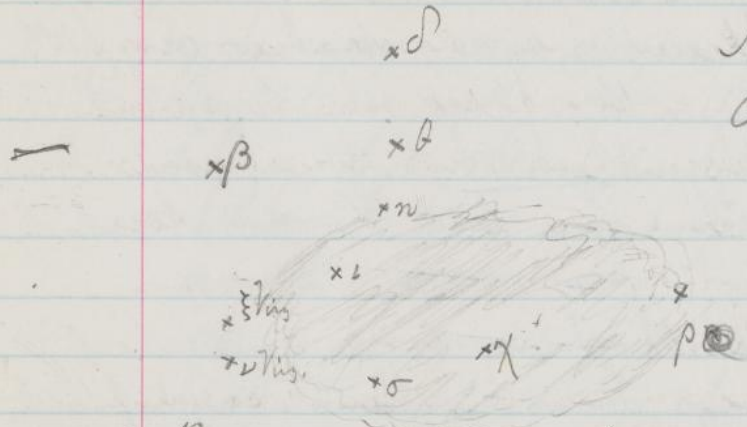
α Leonis decidedly dark, and band from Bracchæ to θ Leonis not extended towards ε and η Leonis.

Place of ρ Leonis $10^h\ 26^m.5$ $+9\ 55'$
" " ι " 11 17.7 +11 11
" " Gegenschein 10 52.1 +10 33

4, $10\frac{3}{4}$ P.M. Day rather clear, partly cloudy in the afternoon; evening cold and nearly clear; aurora suspected since 10 P.M.; (none visible last night); Gegenschein probably apparent, but suspicion not quite as strong as yesterday: brightness very slightly greater than that of band below in region between σ and α Leonis; limits indefinite.

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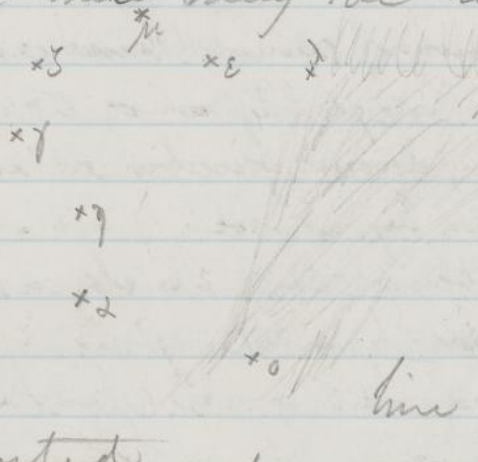
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Middle of brighter part considered to be $\frac{4}{5}$ of the way from ρ to χ Leonis:

Place of ρ	10h 26.5m	+9° 55′	
χ	10 58.8	+7 59	
Gegenschein	10 52.3	+8 22.	

The region between Praesepe and ε Leonis is partly bright: this band there may be represented as below; so that the appearance of Feb. 8 may be due to this band entirely; but it does not seem to reach the line from ε to γ Leonis as then reported.

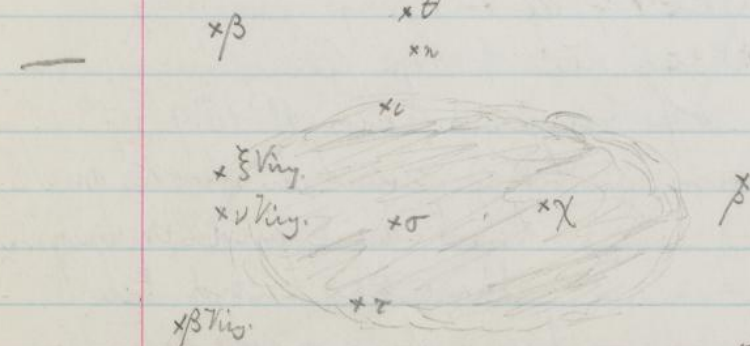


4, 11½ P.M. Appearance of aurora continuing; perhaps a narrow dark space below it.

5, 10½ P.M. Day and evening clear and cold; no aurora seen; Gegenschein much as yesterday; centre estimated $\frac{1}{3}$ of the way from χ to δ Leonis; Place of χ 10h 58.8m +7° 59′

Place of σ 11 14.9 +6 41

Gegenschein 11 4.2 +7 33



Observation of yesterday respecting band between Praesepe and σ Leonis confirmed; Ordinary lands of the region well seen; sky between η and β Virginis darkening towards β (effect of altitude); light does not appear to extend to

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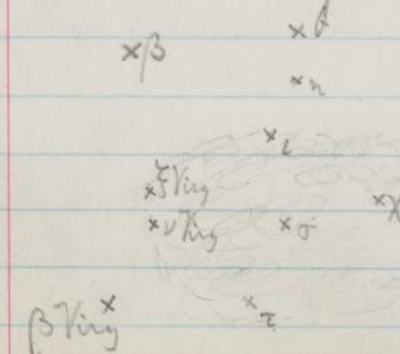
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March, 1883.

β Virginis on the following side, not quite to ρ Leonis on the preceding side; it was very little if at all brighter than the band below Leo, but seemed to be distinguishable from the band to Coma Berenices between Leo and Virgo, into which it extended.

7, 10 A.M. Yesterday cloudy with snow beginning about noon; evening cloudy. Snow measured in 5 places $2\frac{1}{2}$, $4\frac{1}{4}$, 3, 2, 4; mean 3.150 inches; $19\frac{1}{2}$ inches in cylinder $1\frac{13}{16}$ inches across weigh $4\frac{3}{4}$ ounces; 9.82714 9.21380 / 8.70097 0.49831 / 0.67866 9.71211
hence rainfall to 1 inch of snow 0.1636 inches; total rainfall 0.515 inches. Gauge $2\frac{3}{4}$ ounces; 0.243 inches; direct measure preferred; snow fine and rather compact, and accompanied by wind.

7, 11 P.M. Day mostly clear with occasional clouds and a few snowflakes early in the evening; evening mostly clear, cold; aurora slightly suspected early in the evening, and a faint auroral arch now suspected; Gegenschein pretty strongly suspected; sky decidedly clear; uniformly dark between η and β Virginis, darkening towards β if anything; sky between α and ρ Leonis decidedly darker than band below; centre of Gegenschein estimated $\frac{3}{4}$ of the way from χ to ρ Leonis; for places see p. 19; resulting place of Gegenschein $11^h\,10^m.9 + 7°\,1'$.



Gegenschein looks smaller than usual and is brighter than the band below Leo, but from its situation is confused with part of this band at present.

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7, 11¼ P.M. Barom. 30.059; attached therm. 24.8; No. 4, 14.3; auroral arch now very obvious, with dark sky below.

8, 11 P.M. Day clear and cold; evening mostly cloudy and hazy, but clear early and also 9 to 10½ P.M. Auroral light among and over clouds at the north; clouds now risen so as to show lower edge of arch, with dark sky below. Gegenschein suspected at 9 P.M. about as yesterday; now too hazy for observation.

8, 11 5/12 P.M. Arch now breaking into streamers.

9, 10½ A.M. Yesterday evening near midnight it was nearly clear again; the aurora continued, fading after midnight to a faint arch; Gegenschein still suspected about as yesterday; there seemed to be a dark channel on the preceding side of β Virginis, and no sign of light between β and γ Virginis. The place of the supposed Gegenschein in the bend of the band from α Leonis to Coma Berenices makes the whole observation very doubtful. The usual bands were visible.

Mr Wendell looked on the evening of March 7 and saw some light between Regulus and the Sickle, towards λ Leonis (probably the permanent band of that region). On some previous night he also suspected light in the region of the Sickle. He did not notice light in the region where I suspected Gegenschein. See note March 15 on observation of March 8 by O. C. Wendell.

9, 11 P.M. Day clear, rather cold; evening mostly clear, with some haze and clouds at times; no aurora seen; Gegenschein suspected, but still not reaching β Virginis; triangle formed by β, ι, θ, Leonis thought to be relatively

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March 1883.

darker than previously; centre of supposed Gegenschein estimated $\frac{1}{4}$ of the way from σ to 75 Leonis. Place of 75 Leonis $11^h\,11^m.1$ $+2°\,41'$ } $11^h\,14^m.0$ $+5°\,41'$
σ Leonis $11\;14.9$ $+6°\,41$ }
~~See note March 15 on Observation of Gegenschein March 8 by O.C. Wendell.~~

10, $6\frac{3}{4}$ P.M. Barom. 29.000; attached therm. 31.9; No.4, 31.6; gauge $8\frac{5}{8}$ ounces (0.761 inches). Day cloudy and windy, with snow & rain followed by rain; little rain after 3 P.M.; wind backing from E. to N.E. and finally N.W.

10, 7 P.M. Barom. 29.020; attached therm. 32.2; No.4, 33.0

10, $10\frac{1}{4}$ P.M. Early evening cloudy; clearing off later; now pretty clear, but hazy; no aurora seen.

11, $9\frac{3}{4}$ A.M. Clouded over yesterday evening between $10\frac{1}{4}$ and $10\frac{3}{4}$ P.M.; clouds from the S.W. No additional water in gauge this morning.

11, $11\frac{1}{4}$ P.M. Day windy, mostly rather clear, with occasional clouds; evening rather clear, with some clouds; no aurora seen; Gegenschein looked for carefully; the dark channel preceding β Virginis remains, but is perhaps less dark than before near β Virginis and immediately to the north of it; centre of suspected Gegenschein $\frac{1}{4}$ of the way from σ Leonis to β Virginis.
σ Leonis $11^h\,14^m.9$ $+6°\,41'$ } Gegenschein $11^h\,22^m.3$ $+5°\,31'$
β Virg. $11\;44.1$ $+2\;26$ }

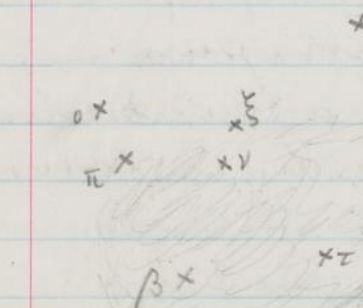
13, $12\frac{5}{12}$ A.M. Barom. 29.696; attached therm. 31.0; No. 4, 30.7 Yesterday forenoon clear, afternoon cloudy; thin variable clouds in the evening, some stars visible at times. The maximum reading yesterday forenoon is wrong unless the mercury shifted after the previous setting; perhaps the reading should have been 35.6

13, $11\frac{3}{4}$ P.M. Barom. 29.966; attached therm. 31.0; No. 4, 31.1. Day rather clear; evening mostly clear; some clouds at times; no aurora seen.

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Gegenschein somewhat suspected to extend beyond β Virginis; centre supposed to be half way from ν Virginis to τ Leonis; but very much confused with the band of that region; the body of Leo dark on looking at it after observing the supposed Gegenschein; faint band visible below β and η Virginis, parallel to line joining them.



Place of ν Virginis 11h 39m.7 + 7° 1′
" " τ Leonis 11 21.8 + 3 31
Gegenschein 11 30.8 + 5 22

15, 9½ P.M. Yesterday somewhat cloudy and thawing; thin variable clouds in the evening. Mr. Wendell suspected Gegenschein March 8 about ε Leonis.

15, 10½ P.M. Day mostly clear and warm, becoming cooler; thin clouds continually passing in the evening; no aurora seen.

16, 10½ P.M. Day and evening clear and rather cold; no aurora seen.

17, 8½ P.M. Mr. Chandler saw a fine parhelion about sunrise this morning.

18, 9½ A.M. Yesterday cool and somewhat cloudy; evening cloudy after 8 P.M.

18, 12 P.M. Day clear and warm; much thin cloud in the evening; repeated lunar coronas and faint halo later; no aurora seen.

20, 9½ A.M. Yesterday cloudy and cool day and evening, with rain during the following night.

21, 9¾ A.M. Yesterday cloudy and cool day and evening.

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March 1883.

21, 10½ P.M. Day clear at first; afternoon rather cloudy; evening rather clear with frequent thin clouds; no aurora seen.

22, 10½ P.M. Day clear and rather cold; evening rather clear with some thin clouds; imperfect lunar halo about 7½ P.M.; no aurora seen.

23, 11½ P.M. Day somewhat cloudy, with a few snowflakes; afternoon and evening clear; no aurora seen.

24, 10½ P.M. Day and evening clear and rather cold; no aurora seen.

25, 11½ P.M. Day and evening clear and cool; no aurora seen; zodiacal light distinct about 8 P.M.; about that time neighborhood of σ Leonis looked relatively darker than early this month, and the space preceding β Virginis decidedly dark; but whole region too low for good observation, and moon rose soon afterwards.

28, 9½ A.M. Yesterday cloudy day and evening, with a little rain and snow. Previous evening also cloudy.

28, 10¾ P.M. Day mostly clear and cool; evening clear till 10 P.M., afterwards rather cloudy; light in the north at present, probably auroral.

29, 9½ A.M. Mostly clear soon after last record; observation of region of σ Leonis as on March 25; sky between β and γ Virginis darkest towards β; some suspicion of Gegenschein between γ and γ Virginis but the moonlight beginning to appear in the southeast prevented a good observation.

29, 10½ P.M. Day mostly clear; evening rather clear, especially at first, but with hazy and sooty clouds; some light, probably auroral, among clouds in the north, with some appearance of a dark space below with its upper edge forming an

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arch; region of σ Leonis examined early in the evening, the usual bands pretty well seen; it is doubtful whether the sky at the bend in the first band is less bright than early in the month.

30, 11 P.M. Day cloudy with some snow; evening mostly clear, with some haze; no aurora seen. Rather hazy for observation of Gegenschein, but band in Leo and Coxlams seen distinctly; the region in it near τ Leonis is certainly brighter than the rest, and must make all observations of Gegenschein there very doubtful. Between β and γ Virginis the part near β was the darker; some light suspected with centre half way from χ Virginis to middle point of line from η to γ Virginis. Place of χ Virginis $12^h 35^m.0$, $-7° 20'$; of η Virginis $12^h 13^m.8$, $+0° 0'$; of γ Virginis $12^h 35^m.6$, $-0° 47'$; Gegenschein $12^h 28^m.8$, $-3° 28'$.

31, 11 P.M. Day clear at first, becoming cloudy; evening partly cloudy, some stars visible through haze; somewhat clearer at present; no aurora seen.

Report to Signal Service sent April 4. (In this copy, the form is condensed to save space.)

Aurora looked for every clear evening; auroral light among clouds 11 P.M. March 1 and $11\frac{3}{4}$ P.M. March 2; some appearance of aurora March 4, $11\frac{1}{4}$ P.M; on March 7, aurora suspected during the evening, forming a very obvious arch at $11\frac{1}{4}$ P.M., with dark sky below; March 8, auroral arch with dark sky below seen under clouds at 11 P.M, afterwards breaking into streamers, and lasting after midnight as a faint arch; March 28, light in the north, apparently auroral, at $10\frac{3}{4}$ P.M.; March 29, light among clouds in the north, apparently auroral, with some appearance of arch and dark space below at $10\frac{1}{2}$ P.M.

Zodiacal light distinct March 1, 2, 5, 7, 8, 9, 25, 28, 29, 30; visible also March 4, $9\frac{1}{4}$ P.M.; observations on other evenings hindered by moonlight or clouds.

Parhelion at sunrise March 17.

Lunar halos. Repeated lunar coronas, and faint halo later, in the evening of March 18; imperfect lunar halo about $7\frac{1}{2}$ P.M. March 22.

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April 1883.

Date	Time A.M.	Barometer	Attached thermometer	No. 4	Minimum before sunrise	Maximum before sunset	Maximum after sunset	Gauge	Rainfall in inches	Wind	Clouds.	Date
1	9½	29.956	32.1	28.3	20.0	27.9	40.8	28.6	0		2 NW	0	1
2	10	30.124	31.3	33.1	21.2	33.0	36.8	33.0	0		1 NE	1 Rs	2
3	10	30.066	34.0	36.7	24.0	36.1	41.2	36.5	0		2 NE	0	3
4	10	30.162	37.4	40.3	27.7	39.9	43.3	40.3	0		1 W	0	4
5	10	29.868	40.8	45.4	36.0	44.3	47.0	45.0	0 ¼	0.022	3 S	10 Rm; a little rain	5
6	9¾	29.656	46.0	47.7	42.8	46.9	53.0	47.3	0 ¼	0.022	2 N	10 Rm Fm →	6
7	10¼	29.896	41.5	33.1	32.5	32.5	52.2	33.6	1 ½	0.132	2 NE	10 P; fine rain	7
8	9½	29.934	37.9	32.8	30.2	32.2	35.0	33.0	2	0.177	1 NW	10 P; a little snow	8
9	9½	30.204	41.0	46.9	32.1	46.4	46.4	46.3	0		1 SW	0 Rs	9
10	9½	29.970	45.3	52.7	39.5	51.8	59.0	52.0	0		2 SW	6 P Rs Fm	10
11	10	29.936	47.8	39.7	38.3	39.1	66.3	40.0	0 ½	0.044	2 NE	10 P; fine rain	11
12	10	29.952	45.0	49.4	35.7	48.8	48.5	48.4	1	0.088	1 W	5 Rm Fm →	12
13	10	30.184	46.0	44.0	40.2	43.3	55.0	44.0	13¾	1.214	2 NE	10 Rm	13
14	10	30.476	44.6	46.7	33.1	46.1	50.9	46.7	0		2 E	0 Fm	14
15	9¾	30.244	42.1	46.3	30.9	45.7	47.8	46.0	0		1 S	0 Rs	15
16	10	30.003	45.3	48.4	35.3	47.2	57.0	47.6	0		2 SW	9 P Fm	16
17	9¾	30.000	51.0	53.7	46.8	52.8	62.0	53.5	0		0 calm	1 P Fm haze	17
18	9¾	29.930	52.0	56.1	40.3	55.3	59.0	55.9	0		3 N	0 Rs	18
19	10	29.920	50.3	53.3	38.0	52.3	63.2	53.0	0		2 E	1 Fm haze	19
20	10	29.650	51.6	47.7	45.3	47.0	64.4	48.0	0		2 NW	10 Rm Fm	20
21	9¾	29.999	44.2	46.3	33.3	45.6	48.0	46.3	4⅛	0.364	2 NW	0 Rs	21
22	9½	29.999	44.6	43.6	33.5	42.7	54.0	43.5	0		2 NW	6 P Rs Fm →	22
23	9¾	29.754	44.7	37.8	33.8	37.2	51.9	38.3	0 ½	0.044	2 NE	10 Rm Fm; a few snowflakes	23
24	9¾	29.762	42.0	37.3	31.9	36.8	38.7	37.8	2¼	0.199	1 N	6 Rm M Fm →	24
25	9½	29.784	39.6	37.9	32.5	37.3	44.6	38.3	0¾	0.066	2 NW	5 M Fm →	25
26	9¾	30.160	39.6	41.1	27.7	40.3	45.0	41.0	0		2 N	1 P Rs	26
27	10	29.799	44.9	49.1	34.4	48.1	52.2	48.5	0		2 SW	5 Rs Fm →	27
28	9¾	29.711	50.0	52.1	44.8	51.4	62.3	52.0	0		2 W	6 Rm Fm →	28
29	9¾	29.846	45.7	40.7	36.5	40.1	55.4	40.6	0 ¼	0.022	1 NE	10 P	29
30	9½	30.034	41.0	43.4	29.5	42.9	43.3	43.3	0 ½	0.011	1 NW	0 Rs	30
	9.8	898.979	1298.7	1311.6	1028.0	1291.0	1526.2	Max. set inside building	27 ⅞	2.405 Rainfall for month 2.40 inches	51	142	
		29.966	43.3	43.7	34.3	43.0	50.9				1.7	4.7	
		29.926											

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Date	Time P.M.	Barometer	attached Thermometer	No. 4	Wind	Clouds	Time P.M.	Zodiacal Light	Time P.M.	Aurora	Report to Signal Service
1	8 3/4	30.060	38.3	30.0	1 NW	0	8 3/4	Distinct	8 3/4	None	None
2	8 1/2	30.047	39.0	33.0	0 NW	4 P haze	8 1/2	Distinct	8 1/2	None	None
3	8 1/2	30.057	40.9	34.9	1 SW	3 P Rs haze	8 1/2	Cloudy	8 1/2	Diffused light	Aurora
4	8 1/2	30.181	44.6	40.3	0 calm	3 P haze	8 1/2	Visible among clouds	8 1/2	Light over clouds	Aurora
5											Obsc.
6	8 1/2	29.944	47.5	43.1	1 NW	1 P haze	8 1/2	Visible among clouds	8 1/2	None; some clouds	None
7											Obsc.
8											None
9	8 1/2	30.090	50.9	46.5	2 S	1 haze	8 1/2	Moonlight	8 1/2	None	None
10	8 1/4	29.962	56.1	53.3	1 SW	0	8 1/4	Moonlight	8 1/4	Moonlight	None
11											Obsc.
12											Obsc.
13	8	30.320	47.8	43.1	0 SW	1 P 7m	8	Moonlight	8	Moonlight	None
14	8 1/2	30.416	44.7	38.2	0 calm	1 P haze	8 1/2	Moonlight	8 1/2	Moonlight	None
15	8 1/2	30.097	52.0	45.3	1 SE	0	8 1/2	Moonlight	8 1/2	Moonlight	None
16	8 1/2	29.958	53.8	49.8	1 SW	7 P 7m	8 1/2	Cloudy	8 1/2	Cloudy	Obsc.
17											Obsc.
18	8 1/4	29.913	57.3	53.6	1 N	1 Rs 7m	8 1/4	Moonlight	8 1/4	Moonlight	None
19											Obsc.
20	8 1/2	29.804	47.3	42.4	1 NW	0	8 1/2	Moonlight	8 1/2	Moonlight	None
21	10 3/4	30.018	50.2	41.7	0 N	1 Pm Rs 7m	10 3/4	Moonlight	10 3/4	Moonlight and clouds	None
22											Obsc.
23	11	29.675	43.4	34.8	2 NE	10 Pm	11	Cloudy	11	Cloudy	Obsc.
24											Obsc.
25	8 1/4	30.002	45.6	38.3	1 W.	0 Rs 7m	8 1/4	Twilight	8 1/4	Twilight.	Aurora
26	9 1/4	30.047	47.0	39.9	1 SW	3 P haze	9 1/4	Visible above clouds	9 1/4	None; some clouds	None
27											Obsc.
28											Obsc.
29	8 1/4	29.871	45.2	36.3	0 calm	0 Rs	8 1/4	Twilight	8 1/4	Twilight	None
30	8	30.150	50.8	46.7	1 N	2 7m	8	Twilight	8	Twilight	None

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April, 1883

1, 10½ P.M. Day clear and cool; evening rather clear, but with some haze and thin clouds after 9 P.M.; no aurora seen.

2, 10½ P.M. Day clear and cool; evening rather hazy and cloudy; no aurora seen.

4, 12½ A.M. Yesterday clear and cool; rather cloudy towards night; clouds gradually disappearing in the evening; mostly clear now; irregular aurora all the evening still continuing; soft streamers among clouds about 8¼ P.M.; Gegenschein suspected 11¾ P.M.; centre half way from γ to χ Virginis; place of χ Virginis $12^h 35^m.0$, $-7° 20'$; of γ Virginis $12^h 35^m.6$, $-0° 47'$; of Gegenschein $12^h 34^m.3$, $-4° 4'$. Sky evidently brighter in this region than in Corvus or preceding ε Virginis; but previous observations show some permanent brightness below β and γ Virginis. The suspected Gegenschein did not extend eastward beyond θ Virginis; on the preceding side its boundary was indefinite.

4, 10½ P.M. Day mostly clear; evening rather cloudy, occasionally somewhat clear; auroral light about the altitude of γ Draconis and γ Cassiopeæ at 9 P.M.; the light was in irregular patches, sometimes forming an arch; thin dark clouds often just below; little auroral light near horizon; it was brightest near γ Draconis, but appeared as far in the west as the Pleiades; mostly faded out before 10 P.M. A meteor as bright as Capella at $9^h 52^m$ P.M. moving horizontally from east to west near head of Draco.

6, 9¾ A.M. Yesterday cloudy day and evening, with a little rain.

7, 10¼ A.M. Yesterday mostly clear; evening hazy with frequent clouds; no aurora seen.

8, 9½ A.M. Yesterday cloudy day and evening, with a little rain and snow.

9, 9½ A.M. Yesterday cloudy with a little snow early; clear

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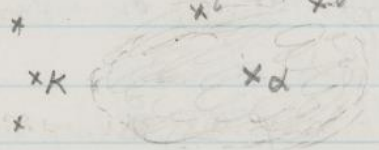
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towards night; evening clear; zodiacal light visible early; no aurora seen; Gegenschein not discernable on short examination at 11 P.M.; ~~not~~ no certainty of any change near γ Virginis since April 4; continuous light from below β & γ Virginis to α Virginis; sky dark between β & γ Virginis.

[record of April 4, relating to evening of April 3]

10, 9½ P.M. Yesterday clear and rather warm; evening clear, with increasing haze; no aurora seen; too hazy at 11 P.M. for observation of Gegenschein.

10, 11½ P.M. Day and evening clear and warm; no aurora seen; zodiacal light suspected about 8½ P.M., notwithstanding moonlight; meteor as bright as α Lyrae about 11h 25m P.M. from near α Lyrae towards α Cygni. Gegenschein suspected; centre estimated half way between ψ and κ Virginis; the band below β and γ Virginis visible as usual;



it seems only two or three degrees wide and extends to α Virginis, but near α Virginis this light seems a little brighter as in sketch; the difference seems more decided than anything which was seen April 8. Place of ψ Virginis 12h 48m.1, −8° 53'; of κ Virginis 14h 6m.5, −9° 43'; of Gegenschein 13h 27m.3, −9° 18'.

12, 10 A.M. Yesterday cloudy and cold day and evening, with a little rain.

13, 10 A.M. Yesterday partly clear at first, cloudy later with rain; some lightning and thunder 8 P.M. and later, with heavy showers during the following night.

13, 11½ P.M. Day cloudy, clear towards night; evening clear; no aurora seen.

14, 11 P.M. Day clear; evening somewhat hazy; no aurora seen; faint lunar halo 8½ P.M.

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April 1883.

15, 9¾ A.M. Yesterday evening about 6½ P.M. there was a faint parhelion above the sun.

15, 11 P.M. Day and evening clear, rather warm; no aurora seen.

17, 9¾ A.M. Yesterday clear and warm; evening mostly cloudy.

18, 9¾ A.M. Yesterday mostly clear and rather warm; evening cloudy.

18, 9½ P.M. Day clear and warm; evening rather clear, with thin clouds; no aurora seen; imperfect lunar halo about 9 P.M.

20, 10 A.M. Yesterday rather clear, becoming cloudy; evening cloudy, with a few drops of rain.

20, 11 P.M. Day cloudy with some rain; clear towards night, evening clear; no aurora seen.
Barom. 29.864; attached therm. 47.7; No. 4, 39.2

21, 9¾ A.M. Some thunder and lightning with the rain yesterday forenoon.

21, 10¾ P.M. Day mostly clear and cool; cloudy towards night; evening partly cloudy, rather clear after 10 P.M.; no aurora seen.

23, 9¾ A.M. Yesterday mostly cloudy; evening cloudy.

23, 11 P.M. Day and evening cloudy, with a little snow and rain.

25, 9½ A.M. Yesterday cloudy day and evening, with some snow the preceding night and a little the next night.

25, 11 P.M. Day and evening mostly clear and cool; light aurora visible in moonlight; streamers seen by Professor Pickering before moonrise; zodiacal light distinct after end of twilight; haze near horizon light in northwest, dark in southwest, producing an apparent extension of zodiacal light like that in Jones Nos. 212–215. This was distinctly not the twilight arch, which had previously sunk to the horizon. Southern edge of zodiacal light better defined than northern edge above the extension. Zodiacal light rather dim, but brighter than Milky Way at same altitude. The

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apparent edge is certainly not a line of equal brightness; it is much fainter towards the summit. This remark confirms many similar unrecorded observations in past years. Leo decidedly dark; band below well seen about 8¾ P.M.

26, 11 P.M. Day rather clear and cool, cloudy towards night; rather clear 9 to 10½ P.M.; afterwards cloudier; no aurora seen.

28, 9¾ A.M. Yesterday rather cloudy; evening hazy and cloudy.

29, 9¾ A.M. Yesterday rather cloudy; evening cloudy.

29, 11 P.M. Day cloudy with a few drops of rain; clearing off about 5 P.M.; evening clear; no aurora seen; Zodiacal light visible at 9¾ P.M.; Gegenschein suspected at 10¾ P.M.; somewhat as in sketch, centre ⅔ distance from λ Virginis to α Librae; band as usual below β and η Virginis as far as α Virginis; between α and κ Virginis there seemed to be a darker space, and still farther a brighter place as in sketch; this was observed without recollection of the observation of April 10, and is good evidence of change so far as it goes. The light on the preceding side did not go beyond λ Virginis; it seemed to go as far south as the declination of α Librae, and nearly to β Librae on the following side; there was some appearance of an extension to near α Librae on the

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April 1883

north, but near β Librae the sky was darker. Places of

λ Virginis	$14^h 12^m.6$	$-12° 49'$
α Librae	14 44.3	−15 33
Gegenschein	14 33.7	−14 38

30, 9½ P.M. The appearance of Gegenschein was more distinct about 11½ P.M. last night, with boundaries as before.

30, 11¼ P.M. Day mostly clear; evening rather clear, but somewhat hazy; no aurora seen; zodiacal light slightly visible before end of twilight; rather hazy at 11 P.M., and bands of zodiacal region imperfectly visible; Gegenschein very slightly suspected about as yesterday, but no definite observation could be made.

Report to Signal Service, sent May 2, 1883.

Aurora looked for every clear evening; seen as follows:

April 3. Irregular aurora all the evening, still continuing at midnight; lofty streamers among clouds about 8½ P.M.

April 4. Auroral light at 9 P.M. about the altitude of γ (Gamma) Cassiopeiae and γ (Gamma) Draconis; the light was in irregular patches, sometimes forming an arch; thin dark clouds often just below; little auroral light near horizon; it was brightest near γ (Gamma) Draconis, but appeared as far in the west as the Pleiades; it had mostly disappeared before 10 P.M.

April 25. Slight aurora visible in moonlight at 11 P.M.; some streamers seen before moonrise.

Zodiacal light distinct April 1, 2, 25; visible also April 4, 6, 8, 29, 30; suspected notwithstanding moonlight April 10; observations on other evenings hindered by moonlight or clouds.

Meteors. April 4. A meteor as bright as Capella at $9^h 32^m$ P.M., moving horizontally from east to west near head of Draco.

April 10. A meteor as bright as Vega about $11^h 25^m$ P.M., from near Vega towards α (Alpha) Cygni.

Parhelion. April 14, about 6½ P.M., there was a faint parhelion above the sun.

Lunar halos. April 14. Faint lunar halo at 8½ P.M.

April 18. Imperfect lunar halo about 9 P.M.

Lightning. April 12. Some lightning and thunder at 8 P.M. and later, with heavy showers during the following night.

April 20. Some lightning and thunder in the forenoon, with rain.

Frost. Minimum thermometer below freezing point on the mornings of April 1, 2, 3, 4, 8, 15, 24, 26, 30.

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May 1883.

Date	Sunset Civ. Mn.	Barometer	Dry Thermom.	Wet Th.	minimum Temperature	Grass Temp.	maximum Temperature	Solar Rad.	Cloud	Rainfall in inches	Wind	Sky and Remarks	Date
1	9 3/4	30.346	45.0	52.1	32.2	51.2	55.0	51.4	0		1 S	1 Rs 7m	1
2	9 3/4	30.400	47.2	50.0	38.0	49.3	61.9	49.8	0		2 E	5 Rs M 7m ↑ haze	2
3	9 3/4	30.109	51.8	57.6	44.1	56.5	56.8	56.6	0		1 SE	8 P 7m ↑ haze	3
4	10	30.146	54.2	48.2	46.3	47.5	65.8	48.4	0		3 NE	10 P	4
5	10	30.294	49.9	46.4	42.0	45.5	49.0	46.5	0		2 E	10 P	5
6	9 1/2	30.040	47.8	44.4	40.9	43.9	48.3	44.6	0 3/4	0.066	2 N	10 Rm	6
7	9 3/4	30.008	53.2	59.7	42.1	59.0	58.8	58.8	0		1 W	1 P Rs M 7m	7
8	9 3/4	29.793	55.9	65.3	51.2	64.3	70.0	64.0	0		1 SW	3 haze 7m →	8
9	9 3/4	30.158	56.7	52.8	50.3	52.0	74.9	52.5	0		2 N	10 P; rain beginning	9
10	10	30.167	54.0	54.7	45.1	53.9	54.4	54.4	0 1/4	0.022	2 SE	5 P haze 7m	10
11	10	29.878	55.9	69.5	47.3	68.2	68.4	68.0	0		1 E	9 Rm 7m ↑ haze	11
12	9 3/4	30.026	53.3	51.6	44.1	50.8	68.2	51.9	2	0.177	2 NE	6 Rm Rs 7m ↑	12
13	10	29.908	54.4	53.4	48.7	51.9	57.6	53.7	0		2 NW	0 7m	13
14	10	30.170	50.7	49.8	39.3	49.2	60.0	50.2	0		1 NW		14
15	10	29.553	52.0	47.6	42.0	46.8	61.1	47.5	8 1/8	0.717	2 N	10 P	15
16	9 3/4	29.813	52.1	53.2	43.1	52.3	52.8	53.0	0		1 NE	4 P Rs 7m	16
17	9 3/4	30.135	52.0	53.2	40.0	54.4	60.8	55.0	0		2 NE	0	17
18	9 3/4	30.283	56.2	61.8	41.0	61.2	62.0	60.9	0		1 W	0	18
19	9 1/4	30.331	56.1	57.5	42.2	56.7	68.6	57.0	0		2 E	3 Rs	19
20	10	29.774	55.4	53.4	47.2	52.3	62.6	53.2	0 1/4	0.022	2 N	10 P	20
21	10	29.593	59.8	70.8	52.2	69.7	69.7	69.0	0		2 S	5 P Rs M 7m ↑	21
22	9 3/4	29.712	59.0	49.3	48.2	48.4	73.5	49.8	11	0.971	3 NE	10 P; raining	22
23	10	29.652	58.7	59.0	48.1	58.0	57.7	57.3	11	0.971	1 E	10 Rm	23
24	9 3/4	29.723	57.4	60.9	51.2	60.0	60.0	60.0	4 7/8	0.430	2 W	7 P Rm M 7m →	24
25	9 1/2	30.026	57.8	60.3	47.2	59.8	66.7	60.0	0		2 SW	6 Rs	25
26	9 3/4	29.859	63.6	74.9	58.0	73.9	77.2	72.4	0		2 SW	0	26
27	9 1/2	29.674	63.7	63.2	59.8	62.3	83.0	62.8	2	0.177	2 SW	10 Rm 7m ↑	27
28	9 1/2	29.674	63.6	69.2	51.3	68.2	70.1	68.0	0		1 SE	3 Rm M 7m haze	28
29	9 3/4	29.708	62.0	69.2	53.1	68.0	73.3	68.0	0 1/4	0.022	3 S	8 Rm 7m →	29
30	9 3/4	30.168	60.3	63.2	49.0	62.5	76.4	62.6	0		1 W	1 Rs 7m	30
31	9 1/2	29.830	63.6	67.9	56.6	61.6	73.8	61.6	0 5/8	0.055	3 S	10 Rm	31
	7.8	928.951 29.966 29.894	1721.3 55.5	1792.1 57.8	1444.8 46.5	1759.3 56.8	1898.4 61.2	Max. at single reading	~~41 3/8~~	3.630 Rainfall for month 3.6 inches	55 1.8	167 5.6	

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May 1883.

Date	Time P.M.	Barometer	Attached Thermometer	No 4	Wind	Clouds.	Time P.M.	Zodiacal light	Time P.M.	Aurora	Report to Signal Service
1	9	30.408	57.8	45.9	1SE	9 P Rs	9	Cloudy	9	None; some clouds	None
2	11¼	30.240	52.7	45.5	0 calm	8 P haze	11¼	Cloudy	11¼	Cloudy	Obsc.
3	8¾	29.995	57.7	58.0	1 S	2 P haze	8¾	Visible among clouds	8¾	Clouds in the north	Obsc.
4	8¾	30.273	52.8	44.5	1 NE	10 P	8¾	Cloudy	8¾	Cloudy	Obsc.
5											Obsc.
6	8½	30.009	52.7	50.4	1 NW	5 P m 7 m h	8½	Twilight	8½	Twilight and clouds	Aurora
7											Obsc.
8	8½	29.875	64.7	63.7	2 W	5 P 7 m haze	8½	Twilight and moonlight	8½	Twilight and clouds	None
9											Obsc.
10	8½	29.978	56.2	49.0	0 calm	4 haze	8½	Moonlight and haze	8½	Moonlight and haze	Obsc.
11											Obsc.
12											Obsc.
13											Aurora
14											Obsc.
15											Obsc.
16	8¼	29.956	53.6	50.1	2 N	0 Rs	8¼	Moonlight	8¼	Moonlight	None
17	8½	30.150	58.0	51.9	1 SE	0	8½	Moonlight	8½	Moonlight	None
18	10½	30.288	60.6	52.9	0 calm	1 Rs haze	10½	Moonlight	10½	Moonlight	None
19											Obsc.
20	10	29.636	59.8	56.5	0 calm	10 P	10	Cloudy	10	Cloudy	Obsc.
21											Obsc.
22											Obsc.
23											Obsc.
24	10½	29.946	60.9	56.1	2 NW	6 P m 7 m	10½	Moonlight	10½	Moonlight and clouds	None
25	8¾	29.950	67.9	67.8	2 S	5 P haze 7 m	8¾	Twilight and clouds	8¾	Twilight and clouds	None
26	11	29.763	66.7	62.0	3 S	10 P m	11	Cloudy	11	Cloudy	Obsc.
27	11½	29.680	64.9	56.8	1 SW	0 haze	11½	None	11½	None	None
28	10¼	29.837	66.0	57.8	0 S	2 P m 7 m haze	10¼	Hazy	10¼	None; hazy	None
29	11	29.942	65.7	53.7	0 calm	1 P haze	11	None	11	None; some clouds	None
30	10¾	30.114	66.0	58.3	2 SW	5 P haze	10¾	Cloudy	10¾	Cloudy	Obsc.
31	10¼	30.044	66.2	59.1	1 W	6 P haze	10¼	Cloudy	10¼	Cloudy	None

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May, 1883.

1, 10¾ P.M. Day rather clear, cloudy towards night; evening mostly rather cloudy; now somewhat clear, but hazy; aurora slightly suspected. Barom. 30.413; attached therm. 51.0; No. 4 434

2, 11¾ P.M. Day rather clear; evening rather clear at first with some haze and clouds; no aurora seen; zodiacal light somewhat visible; haze increased after 10½ P.M.

4, 10 A.M. Yesterday rather clear; evening somewhat clear at first, but with clouds in the north and west; cloudy after 10 P.M.

5, 10 A.M. Yesterday rather cloudy; partly clear for a time after sunset, but cloudy after 8½ P.M.

6, 9½ A.M. Yesterday cloudy and cool day and evening, with a little rain.

6, 11½ P.M. Day cloudy with a few drops of rain; evening partly clear, with many clouds at first; mostly clear after 10 P.M.; zodiacal light faintly visible about 9¾ P.M.; faint light now in northern horizon perhaps auroral. Sky between λ Virginis and α Librae thought not to be as bright relatively to sky between α Virginis and λ Virginis as it appeared April 29. There seems to be light following α Librae, however; centre near ι Librae, but region too low for satisfactory observation. Place of ι Librae 15h 5m.4, −19° 20'.

The band below β and γ Virginis visible as usual; it extends about to ζ Virginis, with an extension southwards to α Virginis.

Region of τ Leonis evidently a bright one, and all observations of Gegenschein there are suspicious. Sky rather dark immediately preceding Scorpius; in the neighborhood of ν, κ, λ, Librae.

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8, 9¾ A.M. Yesterday rather clear and warm; evening cloudy with a few drops of rain.
8, 11 11/12 P.M. Day rather clear and warm; evening rather clear, with passing clouds and haze; no aurora seen; zodiacal light visible about 9¾ P.M.; Zodiac now hazy and cloudy.

10, 10 A.M. Yesterday cloudy day and evening, with a little rain.
10, 10¼ P.M. Day mostly cloudy and rather cool; evening somewhat clear at first, but hazy; cloudy after 9½ P.M.

13, 10 A.M. May 11 cloudy day and evening with some rain; May 12 clear most of the day, evening cloudy.

14, 10 A.M. Yesterday mostly clear; evening rather cloudy; low auroral arch suspected about midnight.

14, 1⅔ P.M. Unusually distinct double solar halo, colored; red on inner edge in both. inner circle complete, brightest beneath, but without parhelia; outer circle only a fragment in the west. At 1h 30m inner radius roughly measured with result 23°.7.
At 1h 36m outer halo (radius) about 45°.

15, 10 A.M. Yesterday mostly clear, with increasing cloudiness after 2 P.M.; evening cloudy with rain.

16, 10¾ P.M. Yesterday cloudy day and evening, somewhat clear for a time about 10 P.M. Today rather clear day and evening, but with frequent passing clouds; no aurora seen.

17, 11¼ P.M. Day and evening clear; no aurora seen.

18, 10½ P.M. Day and evening mostly clear; no aurora seen.

20, 10 A.M. Yesterday mostly clear; cloudy towards night; evening cloudy.

20, 10 P.M. Day mostly cloudy; somewhat clear towards night, but evening cloudy.

22, 9¾ A.M. Yesterday mostly cloudy; evening cloudy, clouds somewhat broken; this morning rainy; thundershowers early.

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May 1883.

23, 10 A.M. Yesterday cloudy day and evening, with some rain

24, 9¾ A.M. Yesterday cloudy day and evening, with some rain.

24, 10½ P.M. Day mostly cloudy; evening partly clear at times; no aurora seen.

25, 10¾ P.M. Day warm and rather clear; evening rather cloudy and hazy, but partly clear at times; no aurora seen.

26, 11 P.M. Day mostly clear and warm; clouds coming on in the evening, with a few drops of rain before 11 P.M.

27, 11½ P.M. Day cloudy with a few drops of rain early; clear towards night; evening clear, somewhat hazy; no aurora seen; zodiacal light visible at 9½ P.M.; band below β and γ Virginis visible about same time; possibly some light about α Librae, but on the whole, some evidence of change since April 29.

28, 10½ P.M. Day mostly cloudy with thunder showers in the forenoon; evening somewhat clear, with much haze and at times thin clouds; no aurora seen.

29, 11 P.M. Day mostly cloudy with some slight showers; evening clear, but somewhat hazy, with clouds in the north; no aurora seen; zodiacal light somewhat visible about 9½ P.M.; region of α Librae at 10¾ P.M. somewhat light; dark channel from α Bootis to β Librae (as last year); still, region of α Librae thought to be somewhat changed from last month.

30, 10¾ P.M. Day clear and warm becoming cloudy towards night; evening cloudy and hazy; somewhat clear now, but with clouds in the north.

31, 10¼ P.M. Day cloudy with a heavy shower about 4 P.M.; evening hazy and mostly rather cloudy, somewhat clear 9 to 10 P.M.; no aurora seen.

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May 1883.

Report to Signal Service, sent June 1, 1883.

Aurora looked for every clear evening; none certainly seen, but suspected as follows:

May 6, 11½ P.M. Faint light in northern horizon, perhaps aurora.

May 13. Low aurora arch suspected about midnight.

(Aurora also very slightly suspected May 1, 10¾ P.M.)

Zodiacal light somewhat visible May 2, 3, 6, 8, 27, 29; observations on other evenings hindered by moonlight or clouds.

Solar halo, unusually distinct, May 14, about 1½ P.M.; one complete colored circle, radius about 23°; a fragment of a larger circle in the west, also colored, radius about 45°.

Thundershowers early May 22, and in the forenoon of May 28.

June 1883.

Report to Signal Service, sent July 2, 1883.

Aurora looked for every clear evening; results as follows:

June 1. Low aurora arch pretty certainly visible about 11 P.M.

June 2. Faint low aurora arch at 9½ P.M.; aurora also suspected at 10½ P.M.; some appearance of streamers.

June 30. Auroral light visible among clouds at 11½ P.M.

Zodiacal light thought to be visible June 2, about 9½ P.M.

Lightning and thunder.

June 4. Much lightning without thunder in the western horizon during the evening.

June 6. Thundershowers about 1 P.M. and later; evening cloudy with rain and lightning without thunder.

June 7. Cloudy, with some thunder and lightning.

June 10. A little thunder and lightning in the afternoon.

June 11. Thundershower about 4½ P.M.

June 13. Thundershower in the afternoon.

June 29. Thundershower about 4½ P.M. with heavy rain.

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June 1883.

Date	Time A.M.	Barometer	Attached Thermometer	No. 4	Minimum Before sunrise	Minimum Before sunrise	Maximum Before sunset	Maximum Before sunset	Gauge	Rainfall in inches	Wind	Clouds	Date
1	10	30.212	61.7	64.3	49.7	63.6	74.8	63.7	4½	0.347	2 NW	1 M Fm	1
2	9½	30.522	61.0	64.3	47.7	63.5	71.3	63.5	0		2 E	0 haze	2
3	10	30.450	59.0	67.4	45.5	66.5	69.7	66.5	0		2 S	4 M Fm /	3
4	9¾	30.173	66.0	67.7	62.2	66.4	75.5	67.0	0½	0.044	2 S	10 Pm	4
5	9½	30.134	70.5	74.1	64.6	73.2	78.8	73.3	0		2 W	3 Rs Fm	5
6	9¾	30.053	72.9	79.1	63.4	77.9	82.8	77.6	0		1 SW	5 Rs Fm haze	6
7	7½	29.848	72.0	77.5	68.0 (see p. 42)	76.0	86.4	75.7	5¼	0.463	2 SW	9 Pm Fm →	7
8	10	29.818	72.6	74.8	66.3	73.8	85.0	74.0	3⅜	0.298	2 W	5 P Rs M Fm	8
9	9¾	29.944	72.5	76.3	62.3	75.1	81.8	75.0	0		1 S	5 P Rs Fm haze	9
10	9½	29.839	72.0	76.9	65.3	75.5	83.4	75.4	0		2 SW	8 Pm M Rs Fm Fm //	10
11	9¾	29.647	73.8	77.9	66.1	76.2	86.7	77.0	0		2 SW	9 Pm M Fm /	11
12	10	29.732	70.8	70.9	62.1	70.1	85.8	70.3	1⅞	0.165	3 W	1 Rs Fm	12
13	9¾	29.700	74.3	80.3	67.8	78.8	81.3	78.4	0		1 S	10 Pm	13
14	9¾	30.057	67.3	61.6	57.5	60.8	86.8	61.5	1	0.088	3 NW	0 Rs	14
15	10	30.300	66.0	70.2	50.0	69.3	71.0	69.3	0		1 E	1 haze	15
16	10	30.282	66.7	69.1	51.6	68.2	75.6	68.4	0		1 S	2 P Rs R →	16
17	9½	30.134	65.9	62.1	55.0	61.1	71.6	61.8	0¼	0.022	1 S	10 Pm ; raining	17
18	9½	30.128	66.4	69.6	54.4	68.3	70.2	68.4	0½	0.044	1 E	10 Pm	18
19	9¾	29.849	67.0	68.9	62.3	67.8	71.2	68.0	0¼	0.022	1 S	10 Pm	19
20	9½	29.772	68.9	71.4	65.3	70.1	75.6	70.2	0		2 S	10 Pm	20
21	8	29.834	68.2	69.5	60.0	68.3	81.7	68.5	0		1 SW	10 Pm	21
22	9	29.925	68.2	68.7	58.7	67.8	77.0	68.3	0½	0.044	1 SW	4 P R	22
23	9¾	29.996	72.3	76.1	61.8	75.1	80.6	75.0	0		1 NE	0 Fm	23
24	9½	30.034	70.5	77.1	62.1	76.2	82.4	76.0	0		1 NW	0 Rs	24
25	10	30.092	72.7	76.9	61.6	76.1	86.0	76.0	0		2 S	1 Fm haze	25
26	10¼	30.138	70.2	67.4	58.1	66.2	85.4	66.6	0		2 E	10 Pm	26
27	10	30.132	69.1	69.0	59.1	67.7	73.0	68.2	0		2 E	10 P	27
28	10¼	29.906	69.1	75.7	60.7	74.6	74.5	74.0	5½	0.485	2 S	9 Pm Fm /	28
29	10	29.900	72.7	78.0	65.0	76.3	84.0	76.3	0		2 SW	8 Pm Fm →	29
30	10	29.808	73.0	74.0	64.6	72.8	85.6	73.0	see p. 43	0.662	2 N	9 Pm Fm Rs	30
	9.7	900.861 30.012 −.109 29.903	2073.3 69.1	2156.8 71.9	1798.8 60.0	2123.3 70.8	2375.5 79.2	Max. set inside (see p. 43)	31	2.734 Rainfall for month 2.73 inches	50 1.7	174 5.8	

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Date	Time 9 P.M.	Barometer	Attached thermom.	No. 4	Wind	Clouds.	Time P.M.	Zodiacal Light	Time P.M.	Aurora.	Report to Signal Service
1	11	30.388	65.8	57.2	1 W	0 haze	11	None	11	Low arch	Aurora
2	10½	30.492	61.3	53.6	1 S	1 haze	10½	None	10½	Suspected	Aurora
3											Obsc.
4	11	30.096	70.6	67.8	2 S	3 haze	11	Hazy	11	Hazy	None
5	11¾	30.096	73.9	68.5	0 W	5 Cs haze	11¾	Hazy	11¾	Hazy	None
6											Obsc.
7											Obsc.
8	10¾	29.997	77.0	69.7	0 calm	5 P 7m haze	10¾	Cloudy	10¾	None; some clouds	None
9											Obsc.
10	10½	29.800	78.1	74.4	1 S	5 P 7m haze	10½	Moonlight and clouds	10½	None; some clouds	None
11	11¼	29.588	75.4	66.5	2 SW	1 Pm 7m	11¼	Moonlight and clouds	11¼	Moonlight and clouds	None
12	11¼	29.714	75.5	69.8	2 S	1 P 7m	11¼	Moonlight	11¼	Moonlight	None
13											Obsc.
14	11¾	30.220	65.2	56.5	0 calm	0	11¾	Moonlight	11¾	Moonlight	None
15											None
16											Obsc.
17											Obsc.
18	11	30.022	68.4	63.4	1 S	10 Pm	11	Cloudy	11	Cloudy	Obsc.
19											Obsc.
20	10½	29.800	72.3	67.7	2 SW	10 Pm	10½	Cloudy	10½	Cloudy	Obsc.
21	9¼	29.872	71.8	67.2	0 calm	2 Pm Rs 7m	9¼	Moonlight and clouds	9¼	Moonlight	None
22	11	29.968	73.8	64.0	1 NW	6 Pm 7m	11	Moonlight and clouds	11	Moonlight and clouds	None
23	10¾	30.002	75.0	68.9	1 S	1 haze	10¾	Moonlight and haze	10¾	Moonlight and haze	None
24	9½	30.056	78.0	71.7	1 S	4 P 7m haze	9½	Cloudy	9½	None; some clouds	None
25	11½	30.101	73.6	62.8	1 S	0	11½	Moonlight	11½	Moonlight	None
26											Obsc.
27											Obsc.
28	10	29.968	75.9	71.4	2 S	4 P 7m haze	10	Cloudy	10	None	None
29											None
30	11½	29.965	67.7	58.2	2 N	3 Pm 7m	11½	None; some clouds	11½	Light among clouds	Aurora

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June, 1883.

1, 11 P.M. Day and evening clear and warm; low aurora arch pretty certainly visible about 11 P.M.; twilight hindered observations of zodiacal light. It is pretty certain that the sky near ℓ Librae is light, particularly on the following side; a somewhat darker channel lies just preceding Scorpius.

2, 10½ P.M. Day and evening clear; at 9½ P.M. faint low aurora arch; zodiacal light also thought to be visible; at 10½ P.M. aurora suspected; some appearance of streamers.

3, 9¾ A.M. Yesterday rather clear and warm, cloudy towards night; evening cloudy,

4, 11 P.M. Day cloudy and warm, clear towards night. evening hazy with clouds at times. Much heat lightning in western horizon during the evening; no aurora seen.

5, 11¾ P.M. Day rather hot and clear; evening hazy with some clouds; no aurora seen.

7, 9½ A.M. Yesterday cloudy and sultry, with thundershowers about 1 P.M. and later; evening cloudy, with rain and lightning without thunder. Reading of minimum this morning recorded from memory some time later; approximate only.

8, 10 A.M. Yesterday cloudy and sultry with some thunder and lightning; evening raing.

8, 10¾ P.M. Day rather clear and warm; evening rather clear, with some clouds and haze; no aurora seen.

10, 9½ A.M. Yesterday warm and rather clear; middle of day somewhat cloudy; clouds coming on from southwest about 8¾ P.M.; cloudy later.

10, 10½ P.M. Day rather clear and hot; evening mostly cloudy; no aurora seen; a little thunder and lightning in the afternoon.

11, 11½ P.M. Day rather cloudy with thundershower about 4½ P.M.; evening rather cloudy, clear at times; no aurora seen.

12, 11½ P.M. Day and evening mostly clear and warm; no aurora seen.

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14, 9 3/4 A.M. Yesterday cloudy day and evening, with a thundershower in the afternoon, and rain later.
14, 11 3/4 P.M. Day and evening clear and pleasant; no aurora seen.
16, 12 1/12 A.M. Barom. 30.302; attached therm., 69.7; No. 4, 57.3; wind 0 E; clouds 4 Pm Fm; yesterday mostly clear and warm day and evening; no aurora seen.
17, 9 1/2 A.M. Yesterday clear and warm; evening cloudy.
18, 9 1/2 A.M. Yesterday cloudy with a little rain; evening mostly cloudy.
18, 11 P.M. Day and evening cloudy, with a little rain in the afternoon.
20, 9 1/2 A.M. Yesterday cloudy day and evening, with a few drops of rain.
20, 10 1/2 P.M. Day and evening mostly cloudy; nearly clear for a time about sunset.
22, 9 A.M. Yesterday mostly cloudy with a little rain; evening mostly rather clear; no aurora seen.
22, 11 P.M. Day mostly hot and rather clear; evening rather clear, with frequent clouds; no aurora seen.
23, 10 3/4 P.M. Day rather hot and dry; clouds at times; evening rather clear, becoming clearer; no aurora seen.
24, 10 1/4 P.M. Day hot and rather clear; evening somewhat clear, but hazy, with some clouds; no aurora seen.
25, 11 1/2 P.M. Day hot and rather clear; evening somewhat cloudy and hazy at first, becoming clearer; no aurora seen.
27, 10 A.M. Yesterday mostly cloudy; evening cloudy.
28, 10 1/4 A.M. Yesterday cloudy; evening rainy.
28, 10 P.M. Day cloudy and rather hot; rather clear towards night; evening hazy, with some clouds; no aurora seen.
29, 5 P.M. Thundershower about 4 1/2 P.M., with heavy rain, almost all of which fell within fifteen minutes. Gauge now 7 1/2 ounces; 0.662 inches.
30, 10 A.M. Yesterday mostly cloudy; evening rather cloudy; somewhat clear 11 P.M.; no aurora seen.
30, 11 1/2 P.M. Day cloudy at first, clear towards night; evening rather clear; auroral light now visible among clouds.

For report to Signal Service for June, 1883, see p. 39.

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July 1883.

Date	Time a. M.	Barometer	attached thermometer	No. 4	minimum Hygrometer	minimum Psychrometer	maximum Hygrometer	maximum Psychrometer	Range	Rainfall in inches	Wind	Clouds	Date
1	10	30.117	65.4	64.7	49.7	64.1	77.6	64.3	0		1 E	0 Fm	1
2	9 3/4	29.858	69.3	73.4	57.4	72.3	73.5	72.3	0		3 SW	0 Rs haze	2
3	9 3/4	30.020	72.6	76.3	63.4	75.2	82.2	75.6	2 7/8	0.254	2 W	3 P haze	3
4	10	30.052	73.0	80.7	65.7	79.4	82.0	79.0	0		1 S	2 P Rs haze	4
5	10 1/2	30.081	77.1	84.9	70.1	83.3	92.0	83.1	1 1/2	0.132	2 SW	9 Pm Fm → haze	5
6	10	30.035	78.8	82.7	71.6	81.9	90.3	81.8	0 1/4	0.022	3 NW	0 Rs Fm	6
7	10	29.855	79.7	85.0	70.3	84.0	90.3	84.0	0		2 SW	0 Rs haze	7
8	9 3/4	29.940	76.3	61.8	60.2	61.1	91.9	62.0	0		2 NE	10 Pm	8
9	10	30.022	68.2	61.7	56.8	61.1	62.3	61.3	4 3/4	0.419	2 NE	10 Pm M Fm	9
10	10 1/4	30.028	67.6	71.2	55.3	70.1	70.0	70.0	0		1 S	6 P Rs Fm	10
11	10	29.917	69.8	73.1	59.4	71.8	78.1	71.8	0		1 SW	10 Pm Fm →	11
12	9 3/4	29.900	73.4	78.5	63.9	77.2	82.5	77.0	0		2 S	1 Fm →	12
13	10	29.833	74.1	76.8	67.8	75.3	85.4	75.3	3 1/8	0.276	2 S	10 Pm	13
14	10 1/4	29.846	74.4	76.0	66.3	75.7	80.8	76.0	0		1 NW	5 M Fm	14
15	9 3/4	29.923	73.0	71.2	63.0	70.1	83.5	70.7	0		1 E	1 haze Fm	15
16	9 3/4	29.872	74.7	75.2	67.8	74.0	75.2	74.0	0 1/4	0.022	2 NE	10 Pm	16
17	10	30.069	73.1	73.4	64.4	72.1	80.7	72.3	0		1 S	10 Pm	17
18	10	30.038	75.3	76.3	69.1	75.4	84.0	75.7	3	0.265	2 NW	0 Fm	18
19	10	30.070	71.0	69.7	57.8	68.6	80.3	69.2	0		1 N	8 M Fm	19
20	10	30.126	69.0	69.8	56.2	68.9	76.1	69.2	0		2 NW	1 M Fm	20
21	9 3/4	30.238	68.7	72.3	55.8	71.3	75.6	71.2	0		1 W	5 P R Rs Fm →	21
22	9 3/4	30.070	72.2	78.5	62.8	76.9	80.6	76.4	0		1 S	10 Pm	22
23	10	29.842	76.3	80.7	70.6	79.8	84.3	80.0	0		2 W	5 R Rs M Fm →	23
24	9 3/4	29.790	71.8	71.3	61.1	70.4	84.9	80.9	2	0.177	2 NW	0 Rs Fm	24
25	10	29.917	70.1	68.8	57.3	68.1	77.1	68.6	0		2 NE	0 Fm	25
26	9 3/4	30.072	71.0	71.3	60.5	70.3	75.2	70.8	0		2 NE	0 Rs Fm	26
27	8 3/4	30.220	67.6	66.9	53.8	66.2	74.6	66.6	0		1 E	1 haze Fm	27
28	10	30.038	71.5	74.9	63.4	73.3	77.1	73.6	2 3/4	0.243	1 S	10 Pm	28
29													29
30	9 3/4	29.95	68.2	67.2	~~46.6~~ 55.9	~~67.9~~ 65.2	78.6	67.9	9 1/4 ?	0.816	2 W.	1 Fm	30
31	10	29.992	67.8	69.3	54.4	68.6	75.0	69.0	0		1 W	0 Rs	31
	9.7	877.7 29.991 29.873	216.0 72.0	220.3.6 73.4	185.7.8 61.7	217.1.7 72.4	240.4.7 80.2	Mean: Hier ungleiche Wägung	29 3/4	2.626 Rainfall for month 2.63 inches	49 1.6	128 4.3	

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July 1883.

Date	Time P.M.	Barometer	Detached Thermometer	No. 4	Wind	Clouds	Time P.M.	Zodiacal Light	Time P.M.	Aurora.	Report of Signal Service
1	11	30.046	69.9	59.7	2 S	1 Pm Fm haze	11	Hazy	11	Light among clouds	Aurora
2	11	29.836	72.5	65.8	2 S	8 P haze	11	Cloudy	11	Cloudy	Obsc.
3	10	30.111	76.5	71.1	1 S	8 Pm Fm haze	10	Cloudy	10	Cloudy	Obsc.
4											Obsc.
5											None
6	11	29.999	83.3	77.4	1 S	0 haze	11	Hazy	11	None	None
7											Obsc.
8											Obsc.
9	10 3/4	30.030	67.1	57.5	0 W	7 Pm Fm →	10 3/4	Cloudy	10 3/4	Cloudy	Aurora
10	10 3/4	29.952	70.9		2 S	0 haze	10 3/4	None	10 3/4	Faint arch	Aurora
11	10 3/4	29.931	76.7	70.8	1 SW	0 haze	10 3/4	Moonlight	10 3/4	Suspected	Aurora
12											Obsc.
13											Obsc.
14	10	29.894	77.8	71.4	0 W	0	10	Moonlight	10	Moonlight	None
15											Obsc.
16											Obsc.
17											Obsc.
18	11 1/4	30.096	76.5	65.2	0 S	0 Fm	11 1/4	Moonlight	11 1/4	Moonlight	None
19	10 3/4	30.084	74.8	63.4	1 NW	0 Fm	10 3/4	Moonlight	10 3/4	Moonlight	None
20	10 3/4	30.183	73.6	64.2	1 S	0	10 3/4	Moonlight	10 3/4	Moonlight	None
21	11 1/2	30.173	74.8	65.9	1 S	0	11 1/2	Moonlight	11 1/2	Moonlight	None
22											Obsc.
23	10 1/4	29.812	77.3	67.4	1 NW	0	10 1/4	Moonlight	10 1/4	Moonlight	None
24	11 1/2	29.812	74.3	63.9	1 NW	0 Rs haze	11 1/2	Moonlight	11 1/2	Moonlight	Aurora
25	10 3/4	29.982	75.7		1 S	0 Rs	10 3/4	None	10 3/4	None	None
26	11 1/4	30.158	70.3	60.9	1 N	0 Rs haze	11 1/4	None	11 1/4	None	None
27	10	30.194	74.6	65.1	1 S	10 Pm	10	Cloudy	10	Cloudy	None
28											Obsc.
29	11 1/2	29.900	74.0	62.2	1 S	0	11 1/2	None.	11 1/2	Bright. See page next	Aurora
30	11 1/2	29.988	72.1	59.8	0 calm	0 Pm Fm	11 1/2	None	11 1/2	Aurora	Aurora
31											Aurora

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July, 1883.

1, 11 P.M. Day mostly clear and cool; evening mostly clear; light apparently auroral, now visible among clouds in the north.

2, 11 P.M. Day clear, becoming cloudy; thundershower about 6 P.M.; rain later; partly clear about 9½ P.M. and later, but rather cloudy especially in the north.

3, 10 P.M. Day mostly rather cloudy; a few drops of rain about 6 P.M.; evening partly clear, but somewhat cloudy, especially in the north; more cloudy after 9¾ P.M.

5, 10½ A.M. Yesterday rather cloudy; evening rainy; thundershower about 6 P.M., with remarkably vivid lightning; very much branched and forked.

6, 10 A.M. Yesterday rather cloudy with a little rain in the evening, preceded by a little thunder and lightning; somewhat clear about 10½ P.M.; no aurora seen.

6, 11 P.M. Day and evening mostly clear and hot; no aurora seen.

8, 9¾ A.M. Yesterday clear and hot; evening mostly cloudy especially in the north, with much lightning, but little thunder.

9, 10 A.M. Yesterday cloudy day and evening, with frequent rain.

9, 10¾ P.M. Day cloudy at first, afterwards rather clear; evening rather clear at first, cloudy passing later; no aurora seen.

9, 11 P.M. Some appearance of auroral streamers among clouds in the north.

10, 10¾ P.M. Day rather cloudy, clearer towards night; evening rather clear; faint auroral arch now visible.

11, 11 P.M. Day cloudy at first, clear later; evening clear with some haze; faint indefinite auroral arch, with occasional streams now visible.

13, 10 A.M. Yesterday rather clear till night; evening cloudy; rain later.

14, 10½ A.M. Yesterday cloudy and rainy, day and evening with a few drops of rain and a little thunder and lightning.

14, 11½ P.M. Day and evening mostly clear; no aurora seen.

16, 9¾ A.M. Yesterday somewhat cloudy and rainy; evening cloudy with a little rain.

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July 1883.

17, 10 A.M. Yesterday somewhat cloudy, rather clear towards night; evening cloudy.
18, 10 A.M. Yesterday rather cloudy; evening cloudy, with rain later.
18, 11¼ P.M. Day and evening clear and warm; no aurora seen.
19, 10¾ P.M. Day somewhat cloudy; evening clear; no aurora seen.
20, 10¾ P.M. Day and evening clear and warm; no aurora seen.
21, 11½ P.M. Day and evening clear and warm; no aurora seen.
23, 10 A.M. Yesterday somewhat cloudy; afternoon partly clear; evening cloudy.
23, 10½ P.M. Day rather cloudy, with a shower about 6 P.M.; evening clear; no aurora seen.
24, 11½ P.M. Day rather clear; cloudy towards night, but evening clear; auroral light suspected about 9 P.M. on clouds in the north.
25, 10¾ P.M. Day and evening clear and warm; no aurora seen.
26, 11¼ P.M. Day and evening mostly clear and rather warm; no aurora seen.
26, 11¾ P.M. Lightning without thunder in the south during the evening.
27, 10 P.M. Day mostly rather clear; evening rather cloudy, but clear between 8¾ and 9½ P.M. except near horizon; no aurora seen.
29. 11½ P.M. Very fine auroral display this evening. A party informed me that the aurora was decidedly seen at 9 P.M. — At 10h 20m P.M. a fine, rather narrow streamer extended from northern horizon to zenith. At 10h 30m and ~~nearly~~ up to present time, large but somewhat detached masses of auroral light flashing and coruscating throughout the northern heavens, extending much of the time to the zenith.
~~At~~ At the present time (11h 35m) the aurora has almost entirely subsided into a very fine but somewhat low arch in north. Height of centre of arch about ¼ distance from horizon to Polaris. W. obs.
Lightning low down in north and north east. W. obs.
30, 12½ P.M. Mr. Wendell says that the rainfall measured this morning was due in part to thunder showers in the night following July 28, and

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~~that~~ the sky cleared slowly during the forenoon of July 29. July 28 was cloudy, with occasional showers and some thunder and lightning.

30, 11½ P.M. Day and evening, mostly clear; aurora all the evening, lofty streamers at 9 P.M., now only light above clouds.

Aug. 1, 10 A.M. Yesterday clear at first, cloudy towards night, with showers and a little lightning in the evening; light between clouds in the north at 10 P.M., perhaps auroral.

Report to Signal Service, sent Aug. 1, 1883.

Aurora looked for every clear evening; results as follows:

July 1. Light, apparently auroral, visible at 11 P.M. among clouds in the north.

July 9. Some appearance of auroral streamers at 11 P.M. among clouds in the north.

July 10. Faint auroral arch at $10\frac{3}{4}$ P.M.

July 11. Faint indefinite auroral arch at 11 P.M., with occasional streamers.

July 24. Auroral light suspected about 9 P.M., over clouds in the north.

July 29. Fine aurora this evening, said to have shown red light about 9 P.M. At $10^h 20^m$ P.M., a rather narrow streamer extended from the horizon to the zenith. From 10½ to 11½ P.M., large, somewhat detached, masses of light, often reaching the zenith, flashing extensively; subsiding at $11^h 35^m$ P.M. into an arch extending about one fourth of the distance from the horizon to Polaris, with an appearance of lightning low in the north and northeast.

July 30. Aurora all the evening; lofty streamers at 9 P.M.; at 11½ P.M. only light above clouds.

July 31. Light, perhaps auroral, at 10 P.M., between clouds in the north.

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July 1883.

Report to Signal Service, continued.

Zodiacal light not visible during the month.

Lightning and thunder.

July 2. Thundershower about 6 P.M.

July 4. Thundershower about 9 P.M., with remarkably vivid lightning, very much branched and forked.

July 5. A little rain in the evening, preceded by a little thunder and lightning.

July 7. Evening cloudy, with much lightning, but little thunder.

July 13. Evening cloudy, with a few drops of rain and a little thunder and lightning.

July 26. Lightning without thunder in the south during the evening.

July 28. Cloudy, with occasional showers, and some thunder and lightning.

July 29. Lightning low in the south and northeast after 11½ P.M.

July 31. Showers in the evening, with a little lightning.

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August, 1883.

Date	Time a.m.	Barometer	attached Thermometer	No. 4	Minimum before/after setting	Maximum before/after setting		Gauge	Rainfall in inches	Wind	Clouds.
1	9 3/4	30.004	69.2	69.0	58.1 / 68.1	78.2	68.7	0 5/8	0.055	1 W	0 P Fm
2	10 1/2	29.886	71.0	78.8	61.2 / 77.3	79.3	77.8	0		2 S	5 P Rs Fm
3	10	29.727	71.0	72.2	63.3 / 71.0	81.0	71.3	0		0 calm	3 M Fm haze
4	10 1/4	29.900	68.9	66.7	53.3 / 66.0	(error in reading 15 6.0 hyper. thermom.)	67.0	0		3 SW	1 P Rs M Fm
5	9 1/2	29.989	67.7	67.3	58.3 / 66.4	73.3	67.0	0		3 W	0 M Fm
6	10 1/4	30.029	67.8	70.6	56.5 / 69.8	75.0	70.0	0		2 W	1 P2 Rs M Fm
7	10	30.137	67.2	71.9	52.2 / 71.0	76.0	71.0	0		2 NW	1 P2 Rs haze
8	10	30.158	68.8	73.3	56.1 / 72.3	79.6	72.2	0		1 NW	5 P2 Rs haze
9	9 3/4	30.172	70.0	73.3	57.7 / 72.0	82.6	72.1	0		0 calm	6 P haze
10	10 1/2	30.151	69.1	74.0	55.9 / 72.7	77.6	72.8	0		1 E	8 P haze
11	9 3/4	30.100	67.1	70.1	55.0 / 69.2	73.1	69.3	0		2 NE	1 P Rs Fm haze
12	9 3/4	30.028	66.5	68.2	54.1 / 67.1	75.9	67.6	0		2 NE	8 P Rs Fm
13	10 1/4	29.910	67.7	70.8	57.4 / 69.8	71.0	69.4	0		1 SW	2 Fm haze
14	9 1/2	30.074	70.2	69.2	61.0 / 68.2	85.4	68.9	0 3/4	0.066	2 NW	9 P Fm
15	9 3/4	30.345	66.7	69.5	52.5 / 68.5	76.3	68.6	0		1 E	7 P2 Rs R
16	9 3/4	30.174	67.4	66.6	57.1 / 65.8	73.7	66.0	0		1 E	10 P Fm
17	10 1/4	30.050	65.8	66.6	55.6 / 65.7	67.0	66.0	2 1/4	0.199	1 SW	5 M Fm → haze
18	9 3/4	30.030	68.6	75.0	61.3 / 73.8	77.0	73.3	0		1 SW	7 P haze
19	9 1/2	29.980	71.7	74.7	67.1 / 73.6	83.2	73.7	0 7/8	0.077	2 SW	10 P
20	8 1/4	29.967	71.1	71.1	62.2 / 70.1	84.4	70.2	0 1/8	0.011	1 SW	2 Rs haze
21	9 1/2	29.926	76.0	76.5	69.6 / 77.2	89.0	78.2	0		1 Nr.	1 Rs. haze.
22	9 1/2	30.084	72.8	76.3	63.2 / 75.4	84.9	76.8	0		2 N.N.W.	1 Rs. haze.
23	9	29.980	74.2	78.4	66.8 / 77.1	88.8	77.7	0		3 S.W.	3 Rs & Fm haze.
24	9 1/2	29.962	75.0	73.7	67.8 / 72.5	89.6	73.8	0 1/2	0.022	2 N.W.	2 Rs. Some haze.
25	9 1/2	30.012	68.9	67.2	55.3 / 66.1	78.9	68.2	0		2 Nr.	0
26	9 1/2	29.980	70.0	72.4	55.0 / 71.3	75.7	72.7	0		3 S.W.	1 Rs.
27	9	30.238	65.2	60.2	48.9 / 59.4	79.8	61.4	0		3 N.W.	0
28	10 1/4	30.265	64.8	66.1	45.3 / 65.1	70.1	65.5	0		2 SE	1 Rs M Fm haze
29	10 1/4	29.987	64.5	60.4	51.3 / 59.4	70.0	60.0	0		3 NE	10 Rm Fm
30	10 1/2	30.042	61.0	67.8	48.1 / 66.4	67.0	66.8	0		2 NE	9 P Rs
31	9 1/2	30.172	63.0	65.9	50.0 / 65.1	69.7	65.1	0		0 SE	1 haze
	9 7/31	30.031 / 30.168 / 29.935	212.8 / 68.7	225.5 / 73.7	178.12 / 57.4	215.34 / 69.5	240.44 / 77.7	Max. set inside building	4 7/8	0.430 Rainfall for month 0.46 Inches	52 / 1.7	120 / 3.9

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August. 1883.

Date	Time P.M.	Barometer	Attached Thermometer	No. 4	Wind	Clouds	Time P.M.	Zodiacal Light	Time P.M.	Aurora	Report to Signal Service
1											Obsc.
2	10	29.824	73.1	65.9	0 W	4 Pm 7m	10	None; clouds	10	None; clouds low.	None
3	11	29.836	74.3	63.8	1 SW	1 Rs haze	11	None	11	Very faint light-	Aurora
4	9½	29.980	73.1	63.4	0 S	0	9½	None	9½	None	None
5	11¼	30.004	71.0	62.7	1 S	0	11¼	None	11¼	Faint light	Aurora
6	11 11/12	30.113	72.2	62.0	0 W	0 haze	11 11/12	None	11 11/12	None	None
7	11	30.140	73.4	65.1	0 calm	5 P haze	11	Cloudy	11	Cloudy	Obsc.
8	10½	30.162	75.5	67.0	0 calm	4 haze	10½	Hazy	10½	Hazy	None
9	11¼	30.160	73.3	62.2	0 N	6 P haze	11¼	Thick haze	11¼	Thick haze	Obsc.
10	11¾	30.115	70.8	59.6	1 NE	2 haze	11¾	Hazy	11¾	Hazy	None
11	10½	30.070	71.1	60.1	1 N	1 7m haze	10½	Moonlight	10½	Moonlight-	None
12		~~30.0~~									Obsc.
13											Obsc.
14											None
15											Obsc.
16											Obsc.
17	10	30.038	71.4	65.8	2 SW	0	10	Moonlight-	10	Moonlight-	None
18											Obsc.
19											Obsc.
20	7½	29.882	78.7	79.2	1 S.W.	10 P	7½	Cloudy.	7½	Cloudy.	Obsc.
21	12¾	30.010	76.5	68.2	1 S.S.W.	1 Ro.	12¾	Moonlight	12¾	Moonlight.	None
22	13	30.032	77.2	69.4	3 S.W.	0	13	Moonlight	13	Moonlight.	None
23											Obsc.
24	13	29.988	73.0	60.1	1 N.W.	0	13	Moonlight	13	Moonlight.	None
25	12¾	30.014	72.8	60.2	1 S.W.	0	12¾	Moonlight.	12¾	Moonlight.	None
26	12¾	30.162	71.1	57.8	1 N.	0	12¾	None.	12¾	None.	None
27	11	30.284	69.3	54.3	0 SW	1 haze	11	Hazy	11	Hazy	None
28	9¾	30.171	67.0	59.4	1 E	2 P Rs haze	9¾	Hazy	9¾	Haze and clouds	None
29	10¼	29.942	62.0	54.4	1 N	3 P haze	10¼	Hazy	10¼	Hazy	None
30	9¾	30.098	65.1	56.6	1 N	4 P Rs haze	9¾	Cloudy	9¾	Cloudy	None
31	11	30.244	68.5	57.2	0 calm	2 haze	11	Hazy	11	Hazy	None

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August 1883.

2, 10½ A.M. Yesterday cloudy and warm with a few drops of rain; somewhat clear at 10½ P.M., but still cloudy in the north.

2, 10 P.M. Day mostly cloudy with a few drops of rain; evening at first cloudy, later somewhat clear, with clouds near northern horizon; no aurora seen.

3, 11 P.M. Day mostly cloudy; evening rather cloudy at first becoming clear; at 9h 50m P.M. a transient but literally distinct appearance of patches of auroral light near northern horizon; only very faint diffused light now visible. Sky rather hazy; band from Aquila somewhat visible; following part of Capricornus suspected to be somewhat light, but impression not confirmed by longer observation.

5, 12½ A.M. Barom. 29.988; attached therm. 70.7; No. 4, 61.3.

5, 12½ A.M. Yesterday somewhat cloudy, evening clear; no aurora seen. Now apparently very clear but with much light 20° and more from the horizon everywhere; band from Aquila not traceable beyond κ Aquarii; Capricornus involved in the light near the horizon; no appearance of Gegenschein.

5, 11¼ P.M. Day mostly clear; evening clear; faint auroral light now visible near northern horizon; appearance of zodiac as yesterday; Capricornus somewhat darker, there being apparently less haze.

6, 11½ P.M. Day and evening mostly clear; no aurora seen; some smoke in northern horizon hinders observation. Zodiac somewhat hazy; much as on the last two nights.

7, 11 P.M. Day rather clear and warm; evening rather cloudy with uniform haze later, rather thick, especially towards horizon.

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8, 10½ P.M. Day warm, somewhat cloudy and hazy; evening hazy, somewhat less so than yesterday; no aurora seen.

9, 11¼ P.M. Day and evening hazy; stars visible at considerable altitudes.

10, 11¾ P.M. Day mostly cloudy; evening hazy, rather clear; no aurora seen.

11, 10½ P.M. Day and evening rather clear, somewhat hazy; no aurora seen.

13, 10¼ A.M. Yesterday mostly clear; evening cloudy.

14, 9½ A.M. Yesterday rather cloudy; slight thunder shower about 7½ P.M.; a little rain later.

15, 9¾ A.M. Yesterday rather cloudy day and evening; clear in the north at 11 P.M.; no aurora seen.

17, 10 P.M. Yesterday cloudy with rain in the afternoon; night and early morning cloudy; clearing off during today; this evening clear; no aurora seen.

19, 9½ A.M. Yesterday rather cloudy with thundershower about 6 P.M.; evening and following night cloudy; a few drops of rain this morning.

20, 8¼ A.M. Yesterday cloudy with a slight thundershower about 6 P.M.; evening cloudy.

20. 7½ P.M. Increasing cloudiness during afternoon. Thunder shower in early part of evening. A little rain fell here, but the principal part of the shower felt to the north of us. W. obs.

21. 9¼ A.M. Cloudy all last evening. No aurora seen. W. obs.

21 {12¾ P.M. / mid. = 22, 12¾ A.M.} Day generally free from clouds, and warm. Some haze, especially near horizon, but disappearing after sunset. No aurora seen. W. obs.

22. 1 P.M. Day warm and pleasant. Sky generally clear, — only a few light clouds. No aurora seen. W. obs.

24. 9½ A.M. Yesterday warm and pleasant the early part of the day. Increasing cloudiness towards noon. Cloudy in afternoon but clouds somewhat broken. Thickly cloudy during evening with light rain at times.

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August, 1883.

24. 9h A.M. Cloudy during night, clearing this morning.
Cow. No aurora seen. W. obs.
" Bottle in gauge emptied. W. obs.
24. 1 P.M. Day pleasant and generally clear. Sky quite free from clouds. Cooler and more comfortable than yesterday. No aurora seen. W. obs.
25. 12¾ P.M. Day pleasant and rather cool. Clear in morning, — Some clouds in middle part of day, — Clear at night. No aurora seen. W. obs.
26. 12¾ P.M. Day pleasant and quite cool. especially in the latter part. Considerable wind at times in middle of day. Some clouds but not continuous, and sky only partially covered. No aurora seen. W. obs.
27, 11 P.M. Day clear and cool; evening somewhat hazy; no aurora seen.
28, 9¾ P.M. Day clear and cool; evening somewhat hazy and cloudy; no aurora seen.
29, 10¼ P.M. Day cloudy and cool, clearer towards night; evening somewhat hazy and cloudy; no aurora seen.
30, 9¾ P.M. Day rather clear and cool; evening rather hazy and cloudy; no aurora seen.
31, 11 P.M. Day rather clear and warm; evening rather clear, with some haze and clouds near horizon; no aurora seen.

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Report to Signal Service, sent Sept. 3, 1883.

Aurora looked for every clear evening; results as follows:

Aug. 3. A transient but tolerably distinct appearance of patches of auroral light near the northern horizon at $9^h\ 50^m$ P.M.; at 11^h P.M. only very faint diffused light.

Aug. 5. Faint auroral light visible near northern horizon at $11^h\ 15^m$ P.M.

Zodiacal light looked for on clear evenings; none visible.

Thunder and lightning. Slight thunder showers Aug. 13, about $7\frac{1}{2}$ P.M.; Aug. 18, about 6 P.M.; Aug. 19, about 6 P.M.; Aug. 20, early in the evening.

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September, 1883.

Date	Time a. M.	Barometer	Attached Thermom.	No. 4	Maximum Thermometer before / after setting	Minimum Thermometer before / after setting	Gauge	Rainfall in inches	Wind	Remarks.
1	9½	30.272	63.1	65.7	49.3	64.7	74.3	65.0	0		1 E	5 P haze
2	9½	30.001	63.2	63.5	52.0	63.0	70.0	63.3	0		1 NW	0 Rs haze
3	10	29.866	68.3	63.6	62.3	62.7	80.1	63.3	0		4 NW	0 Fm
4	9¾	30.187	55.8	55.1	40.1	54.4	66.0	55.0	0		1 SW	0 M Fm
5	9½	29.917	64.3	66.3	54.3	65.3	68.2	65.6	0⅛	0.011	3 W	6 Pm M Fm →
6	10¼	30.184	60.7	62.5	44.2	61.7	72.0	62.0	0		2 SW	0 Rs
7	9¾	30.010	60.6	64.6	47.3	64.0	72.1	63.7	0		0 W	0 Fm haze
8	9¾	30.039	61.4	61.6	48.1	60.3	74.0	60.7	0		1 SW	10 Pm fog
9	9¾	30.091	60.8	56.0	50.5	55.3	69.8	56.3	0⅝	0.055	3 NW	0 Fm
10	10¼	30.404	54.2	55.2	40.1	54.1	61.7	55.2	0		1 NE	1 Rs Fm
11	10½	30.393	56.9	60.3	39.0	59.3	62.0	59.6	0		2 E	4 R Rs
12	10½	30.288	60.8	63.2	52.0	62.1	63.6	62.3	0		3 E	10 Pm
13	10¾	30.172	61.3	61.2	55.0	60.2	64.0	60.5	0⅛	0.011	2 E	10 Pm mist
14	9¾	30.108	62.8	70.0	57.2	68.9	68.9	68.5	0		1 W	10 Pm Fm →
15	10	30.122	67.0	72.6	63.7	71.4	76.5	71.5	0		2 N	10 Pm M Fm
16	9¼	30.108	66.6	65.9	61.9	64.7	75.4	65.1	0		1 E	10 Pm
17	9¼	29.910	66.8	67.2	62.2	66.2	70.9	66.6	0		2 SW	10 Pm
18	10	30.214	63.9	62.5	50.3	61.6	78.2	62.1	0¾	0.066	3 NE	1 Rs
19	10½	30.379	61.8	69.3	48.1	68.5	68.8	68.6	0		3 E	0
20	10¼	30.161	63.2	68.6	52.0	67.3	71.2	67.7	0		1 E	6 R Rs
21	10	30.062	63.1	63.6	53.0	62.7	75.0	63.2	0		3 NE	8 Fm
22	10¼	30.268	59.5	57.4	44.3	56.5	65.1	57.5	0		1 N	5 M Fm haze
23	9½	30.210	58.7	56.9	44.0	57.9	63.8	58.0	0		0 W	9 Pm Fm
24	10	29.988	61.0	66.4	52.0	65.1	lost by interruption	65.0	0		1 SE	10 Pm
25	10½	29.381	63.0	62.3	54.3	61.5	69.0	62.1	9	0.794	4 SW	4 Pm Fm
26	10¼	30.006	57.2	50.8	41.4	50.1	70.0	51.2	0		2 NW	0
27	10¼	30.114	55.7	59.7	39.7	58.5	59.1	59.0	0		2 SW	5 Pm Fm
28	9¾	29.951	62.1	66.7	56.2	66.0	66.8	66.0	0		2 SW	4 Pm haze
29	9¾	30.189	59.9	54.8	46.9	53.8	71.7	55.0	0		1 NW	3 M Fm haze
30	9½	29.847	60.2	64.1	52.0	63.0	63.3	63.0	0½	0.044	0 calm	10 Pm a little rain
	10.0	902.872	1843.9	1879.6	1515.4	1851.1	2011.8	always inside building	11⅛	0.98	53	151
		30.096	61.5	62.6	50.5	61.7	69.4			Rainfall for month 0.98 inches.	1.8	5.0
		-.088										
		30.008										

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September, 1883.

Date	Time P.M.	Barometer	Attached thermometer	No. 4	Wind	Clouds.	Time P.M.	Zodiacal Light	Time P.M.	Aurora	Report to Signal Service
1	11	30.152	66.8	56.1	1 E	9 fog	11	Foggy	11	Foggy	None
2	9 3/4	29.825	72.4	68.0	2 SW	4 P haze	9 3/4	Hazy	9 3/4	Hazy	None
3	11 1/2	30.147	58.8	49.1	1 SE	0 haze	11 1/2	None	11 1/2	None	None
4	10 1/2	29.980	65.7	56.8	2 S	1 P haze	10 1/2	Hazy	10 1/2	Hazy	Aurora
5	11	30.142	63.3	54.7	1 SW	0	11	None	11	Arch	Aurora
6	11 1/2	30.060	64.0	53.8	1 S	0	11 1/2	None	11 1/2	None	None
7	11	29.997	66.4	56.2	0 S	1 haze	11	None	11	None	None
8											Obsc.
9	11	30.314	56.5	47.6	2 NW	0	11	None	11	None	None
10											Obsc.
11											Obsc.
12											Obsc.
13											Obsc.
14											Obsc.
15											Obsc.
16											Obsc.
17											Obsc.
18	10 1/2	30.294	66.7	53.0	1 S	0	10 1/2	Moonlight	10 1/2	Moonlight	None
19	9 3/4	30.290	68.4	59.1	1 SE	5 Rs 7m haze	9 3/4	Moonlight and clouds	9 3/4	Moonlight and clouds	None
20	10	30.002	67.7	58.9	1 SW	8 P2 Rs haze	10	Moonlight and clouds	10	Moonlight and clouds	Obsc.
21											None
22	11 3/4	30.230	62.9	49.8	0 calm	1 fog	11 3/4	Moonlight	11 3/4	Moonlight	None
23	9 3/4	30.137	64.0	57.5	1 S	9 Rs 7m	9 3/4	Cloudy	9 3/4	Cloudy	Obsc.
24											Obsc.
25	10 3/4	29.710	64.3	57.2	4 W	0 P	10 3/4	None	10 3/4	Arch and streamers	Aurora
26	11 11/12	30.108	59.2	44.5	1 SW	0	11 11/12	None	11 11/12	None	None
27	9	30.012	62.2	57.7	2 S	5 haze	9	Cloudy	9	Cloudy	Obsc.
28											Obsc.
29											Obsc.
30											Obsc.

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September, 1883.

1, 11 P.M. Day rather clear and warm; evening nearly clear, becoming foggy; no aurora seen.

2, 9 3/11 P.M. Day rather hot and clear; increasing dampness in the evening; no aurora seen.

3, 11½ P.M. Day rather windy, cool and clear; evening clear; no aurora seen; some haze, making band from Aquila indistinct.

4, 12¼ A.M. Band from Aquila rather plainer about midnight; a slight suspicion of Gegenschein between κ Aquarii and B.A.C. 8694; centre about half way from κ to φ Aquarii.

Place of κ Aquarii	22h	31.6m	−4° 57′
φ "	23	8.1	−6 41
Gegenschein	22	49.8	−5 46

The haze usually prevailing at this season makes it very difficult to learn whether there is any permanent maximum of light in this region. It needs examination at stations further south.

4, 9 3/4 A.M. Slight appearance of aurora at 2 A.M. and later.

4, 10½ P.M. Day mostly clear and warm; evening rather clear, with some haze and clouds; no aurora seen.

5, 11 P.M. A little rain early; afterwards clear and cool; evening clear, with moderate aurora; arch rather ill defined; streamers said to be seen at times. Southern and southeastern sky show traces of faint bands of light which interfere with observation of zodiac; these bands are perhaps due to electric lights of Boston, but may be auroral; they seem to be parallel to the magnetic equator.

6, 11½ P.M. Day and evening clear; no aurora seen. Band from Aquila to Pleiades now well seen, but not conspicuous. The brightest part seems a

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little farther east than when last seen; centre of supposed Gegenschein $\frac{3}{4}$ of the way from κ Aquarii to B.A.C. 8094.

Place of κ Aquarii, 1880, $22^h 31^m.6$, $-4° 51'$
" " B.A.C. 8094 $23^h 9^m.3$, $-4° 8'$
" " Gegenschein $22^h 50^m.4$ $-4° 30'$

Capricornus, as usual, darker than region between δ and β Aquarii. If a continuous zodiacal band existed, it should be perceptible tonight.

7, 11 P.M. Day and evening rather clear; enough haze to make band from Aquila very indistinct; stars twinkling a great deal; no aurora seen.

9, 9 $\frac{3}{4}$ A.M. Yesterday cloudy day and evening, with a little rain.

9, 11 $\frac{1}{4}$ P.M. Day and evening clear and cool; no aurora seen. Band from Aquila to Pleiades easily visible; observer inclined to think (as often before) that ν Piscium is not so near as μ to the medial line of the band. Gegenschein suspected, seeming to be a little further east than on Sept. 6; centre about $\frac{7}{10}$ of the way from κ Aquarii to B.A.C. 8094; hence $23^h 4^m.6$, $-4° 13'$.

11, 10 $\frac{1}{2}$ A.M. Yesterday clear, rather cloudy towards night; evening mostly cloudy, especially towards horizon, with lunar halo about 8 P.M.; nearly clear at 4 $\frac{1}{2}$ A.M. today, with zodiacal light visible in the east as high as Jupiter.

12, 10 $\frac{1}{2}$ A.M. Yesterday nearly clear at first, becoming cloudy; evening cloudy.

13, 10 $\frac{3}{4}$ A.M. Yesterday cloudy day and evening, with a few drops of rain.

14, 9 $\frac{3}{4}$ A.M. Yesterday cloudy with some mist; evening cloudy.

16, 9 $\frac{1}{4}$ A.M. Yesterday and previous day cloudy day and evening.

17, 9 $\frac{1}{4}$ A.M. Yesterday cloudy, partly clear after noon; evening cloudy.

18, 10 A.M. Yesterday mostly cloudy; some thunder and lightning

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towards night, with a little rain; a little more rain later. Cloudy at 3 A.M. today.

18, 10½ P.M. Day and evening clear and cool; no aurora seen.

19, 9¾ P.M. Day mostly clear, rather warm; evening rather clear; some haze and thin clouds; no aurora seen.

20, 1½ A.M. Hazy and somewhat cloudy, with distinct lunar halo for last three quarters of an hour or more, slightly colored.

20, 10 P.M. Day and evening hazy and rather cloudy; somewhat clear near the zenith early in the evening; imperfect lunar halo now visible.

22, 12¼ A.M. Barom. 30.212; attached therm. 63.3; No. 4, 48.6; wind 1 NE; clouds 9 fog. Yesterday mostly rather clear day and evening; no aurora seen; foggy now.

22, 11¾ P.M. Day mostly rather clear and cool; evening clear; no aurora seen.

23, 9¾ P.M. Day and evening mostly cloudy; some stars seen at times.

~~20~~ 25, 10½ A.M. Yesterday cloudy; afternoon and evening rainy.

25, 10¾ P.M. Day windy and somewhat cloudy; evening rather cloudy at first, nearly clear later; aurora all the evening over clouds in the north; variable arch, pretty steady with occasional streamers; band from Aquila now well seen; brightest part does not now seem near κ Aquarii, but east of 27 Piscium; centre supposed to be halfway from 29 Piscium to 44 Piscium.

Place of 29 Piscium	$23^h\ 55^m.7$	$-3°\ 42'$
" " 44 "	24 19.2	+ 1 17
" 31 Gegenschein	0 7.4	− 1 12

27, 12¼ A.M. Yesterday clear and cool day and evening; no aurora seen; Gegenschein now pretty [illegible]

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suspected; centre as near 44 Piscium as ~~possible~~ any point which could be named; $0^h\ 19^m.2$, $+17°\ 17'$: figure approximately as below.



Band to Pleiades very easily seen; but the medial line continues to appear to lie a little above 27 Piscium and ν Piscium; say half way between 29 Piscium and DM. $-1°$ 4514, and half way between ν and μ Piscium; passing through 20 Piscium very nearly, and also through κ Aydarin, as first described.

27, 9 P.M. Day clear and rather warm; evening at first clear, soon hazy; haze increasing.

29, 9¾ P.M. Yesterday rather cloudy and warm; evening cloudy.

30, 9½ P.M. Yesterday rather cloudy and cool; evening cloudy, with a slight thundershower about 9 P.M.

Oct. 1, 9½ A.M. Yesterday cloudy, at first warm; wind from northeast, with rain, about 10 A.M. and later.

Report to Signal Service, sent Oct. 1, 1883.

Aurora looked for every clear evening; results as follows:

Sept. 4. Slight appearance of aurora at 2 A.M. and later.
Sept. 5. Evening clear, with moderate aurora; arch rather ill defined; streamers said to be seen at times; faint auroral bands suspected in the south and southeast.
Sept. 25. Aurora all the evening over clouds in the north; variable arch, pretty steady, with occasional streamers.

Zodiacal light not seen in the evening; seen as high as Jupiter. Sept. 11, 4½ A.M.

Lunar halos seen Sept. 11, about 8 P.M., and Sept. 20, 1½ A.M., this last distinct and slightly colored.

Thunder and lightning Sept. 17, towards night, with a little rain; slight thundershower about 9 P.M. Sept. 29.

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October 1883

Date	Time of M.	Barometer	attached Thermometer	No. 4	Minimum before sunrise	Minimum after sunrise	Maximum before sunrise	Maximum after sunrise	Gauge	Rainfall in inches	Wind	Clouds.
1	9¼	29.950	55.1	45.7	42.2	45.0	63.3	46.5	3¼	0.298	2 N	4 Pm 7m →
2	9¾	29.800	51.5	48.6	35.9	47.8	52.8	49.0	0		3 SE	10 Pm; a little rain
3	9¾	29.926	49.1	47.5	35.4	47.0	49.0	47.5	14⅞	1.313	1 SW	0
4	10¼	30.150	48.0	44.7	35.1	44.0	60.0	45.5	0		3 NW	4 M 7m
5	10¾	30.232	46.9	46.5	32.3	45.4	50.0	46.2	0		3 NW	9 Pm M 7m →
6	10¼	30.350	45.8	46.5	28.2	45.6	47.3	46.4	0		1 NW	3 R Rs
7	9¾	30.287	48.0	47.2	35.3	46.5	52.7	47.3	0		1 N	0
8	9¼	30.346	49.1	42.6	34.1	41.5	55.0	42.4	0		1 NW	7 fog
9	9¾	30.350	53.0	47.4	37.8	46.3	53.9	47.0	0		0 N	10 P fogy
10	10	30.180	51.8	54.9	37.0	54.3	57.6	54.3	0		1 SE	10 Rs haze
11	9½	30.102	57.8	62.8	49.7	62.4	65.4	62.5	0¼	0.022	1 W	5 P Rs
12	10	30.261	58.1	52.7	51.2	51.9	76.7	53.0	0¾	0.066	1 NE	10 Pm mist
13	10	30.138	57.0	63.2	51.5	61.5	62.0	61.1	0⅞	0.077	1 S	10 Pm
14	9¾	29.822	65.7	72.8	60.2	71.4	75.6	71.1	4¾	0.419	2 SW	8 Pm 7m / 7m //
15	9¾	30.294	54.7	46.3	41.4	45.4	77.7	47.4	4	0.353	2 N	7 R Rs 7m / 7m //
16	10½	30.624	48.0	41.4	30.0	40.5	51.0	42.0	0		1 NE	5 M 7m /
17	10	30.624	43.0	40.2	29.1	39.7	44.0	40.5	0		2 N	0
18	10¼	30.582	45.0	42.1	26.2	41.5	45.3	42.7	0		0 calm	0 Rs 7m
19	10	30.313	50.4	57.7	39.0	56.4	56.8	56.2	0		3 S	10 Pm 7m /
20	10¼	30.098	55.7	60.0	53.8	58.5	60.8	58.7	0 5/8	0.055	1 SW	10 Pm; a little rain
21	9¾	30.342	48.9	37.1	35.8	36.4	61.2	38.0	1¼	0.110	2 NE	10 Pm
22	10	30.396	43.2	37.9	29.1	37.2	40.7	38.5	0		2 N	1 Pm 7m
23	9¾	30.428	42.8	39.1	26.2	38.5	43.2	39.6	0		2 N	2 Rs 7m
24	9¾	30.124	45.7	39.8	38.3	38.9	46.8	40.0	16	1.412	3 N	10 Pm; raining
25	10	30.008	44.7	43.3	36.2	42.2	42.8	43.0	2¼	0.188	2 N	10 Pm
26	10	30.046	47.2	44.8	40.2	44.0	48.5	44.8	0⅛	0.011	1 NE	10 Pm
27	10	30.029	46.0	45.3	37.0	44.2	47.0	45.2	1⅝	0.144	1 NW	10 Pm
28	9½	30.144	48.6	47.1	41.6	46.2	50.0	47.1	0		2 NW	0 Pm
29	10¼	29.848	49.5	48.8	42.0	48.1	57.0	48.9	1	0.088	2 SE	10 Pm mist
30	10	29.380	56.2	57.7	47.8	57.0	62.0	58.0	11½	1.015	4 W	0 7m →
31	10½	29.826	53.4	56.7	43.7	55.5	60.2	55.8	0		1 SW	9 P 7m /
	9.9	935:010 30.162 30.103	156.49 50.4	150.84 48.6	130.33 38.8	148.98 47.8	171.2.3 55.2	Max. set inside Breitling	63	5.571 Rainfall for month 5.57 inches	52 1.7	194 6.2

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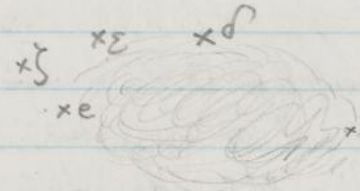
Date	Time P.M.	Barometer	Attached Thermometer	Nod	Wind	Clouds	Time P.M.	Zodiacal light.	Time P.M.	Aurora.	Report Signal Service
1	11¼	29971	51.7	40.4	0 N	0 haze	11¼	None	11¼	None	None
2											Obsc.
3											None
4	11	30.228	46.7	37.3	1 NW	0	11	None	11	None	None
5	8¼	30.338	49.7	39.3	1 NW	0	8¼	None	8¼	Arch and streamers	Aurora
6	~~9¼~~	~~30.~~									None
7	9¼	30.293	57.0	44.2	0 calm	4 fog	9¼	Foggy	9¼	Foggy	Obsc.
8	8¼	30.338	53.8	47.9	1 SW	5 P haze	8¼	Moonlight and clouds	8¼	Moonlight and clouds	None
9	10¼	30.266	55.8	47.7	0 W	0	10¼	Moonlight	10¼	Moonlight	None
10	11	30.089	59.1	54.5	0 calm	2 fog	11	Moonlight	11	Moonlight	None
11	10¾	30.245	62.2	54.5	1 N	8 Pm Fm Fm	10¾	Cloudy.	10¾	Moonlight and clouds	None
12											Obsc.
13											Obsc.
14	10½	30.038	68.0	58.5	3 N	5 Pm Fm →	10½	Moonlight and clouds	10½	Moonlight and clouds	None
15	12½	30.516	52.0	33.7	2 N	0	12½	Moonlight	12½	Moonlight	Aurora
16	11	30.577	49.8	34.7	0 calm	0	11	Moonlight	11	Extensive; irregular	Aurora
17	11¼	30.604	46.5	32.7	0 calm	0	11¼	Moonlight	11¼	Moonlight	None
18	9	30.485	50.4	40.0	1 S	9 Pm Fm	9	Cloudy	9	Moonlight and clouds	None
19											Obsc.
20											Obsc.
21	11	30.348	47.2	32.8	2 N	0 Pm haze	11	Moonlight	11	Moonlight	None
22	8¼	30.396	47.3	34.8	0 W	2 P haze	8¼	Hazy	8¼	Hazy	None
23											Obsc.
24											Obsc.
25											Obsc.
26	11 11/12	29955	46.7	38.2	0 calm	0 haze	11 11/12	None	11 11/12	None	None
27											Obsc.
28											Obsc.
29	8¼	29.447	53.1	61.9	3 S	10 Pm	8¼	Cloudy	8¼	Cloudy	Obsc.
30	8	29.69	58.4	53.5	2 SW	0 Fm.	8	Suspected	8	Suspected	None
31											None

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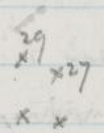
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October, 1883.

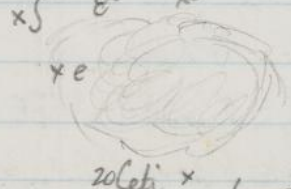
4, 11½ P.M. Day and evening clear and cool; no aurora seen. Slightly hazy at present, but band from Pleiades visible; seems to come to a maximum before reaching 44 Piscium; centre of supposed Gegenschein half way from ε Piscium to 44 Piscium; somewhat as in sketch.



Place of 44 Psc. 0h 19.2m +1° 17'
" " ε " 1 2.2 +5 1
" " Gegenschein 0 40.7 +3 9



3, 9¾ A.M. Yesterday cloudy and cool, with rain, sometimes heavy.
4, 12½ A.M. Barom. 30.087; attached therm. 54.9; No. 4, 43.5; wind 2 N; clouds 1 P Fm. Yesterday clear and cool; no aurora seen. Strong suspicion of Gegenschein about 12¼ A.M. today; centre half way from δ Piscium to 20 Ceti.



Place of δ Psc. 0h 42.5m +6° 56'
" " 20 Ceti 0 46.9 −1 48
" Gegenschein 0 44.7 +2 34

Band from Pleiades well seen.

4, 2½ A.M. Appearance of Gegenschein as before. Band from Pleiades very distinct, but no place in it as bright as that south of δ Piscium until the neighborhood of δ Arietis, where there seems to be a slight maximum, probably permanent.
4, 4 A.M. Eastern zodiacal light conspicuous; vertex near Praesepe; vertex of what might be called the "Stronger" light perhaps half way from α Leonis to Praesepe. This division of the light into "Stronger" and "Diffuse" may easily be made, but there is no such boundary as to make

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it likely that different observers would all regard the distinction in the same way. At the altitude of α Leonis, the middle part of the light is as bright as the Milky Way at the same altitude in the northwest, below Cassiopeia. The light is brighter below α Leonis than above; haze interferes for several degrees above the horizon. The light undoubtedly fades out gradually, both from below upwards, and also laterally; but laterally the diminution of light is ~~not sudden~~ more gradual near the middle and near the extreme edge than between them. At some place where the light fails pretty rapidly, the observer will set the boundary between the "Stronger" and "Diffuse" Light. I should put it in this instance near γ Leonis on the northern side, and carry the "Diffuse" Light as far as ζ Leonis. On the south side the "Stronger" Light would end about $\frac{2}{3}$ of the way from α to σ Leonis, and the "Diffuse" Light some degrees beyond σ Leonis. The medial line of the "Stronger" Light would pass north of α Leonis. The southern edge of the "Stronger" Light is the best defined, especially above α Leonis; but this is not the case with the "Diffuse" Light.

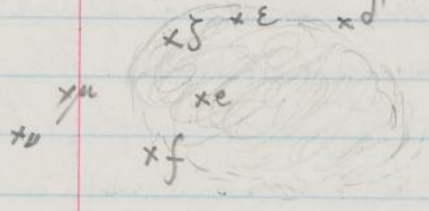
4, 11 P.M. Day and evening clear and cool; no aurora seen. Gegenschein now slightly suspected; not so decidedly suspected as last night; if seen, it has got clear altogether of 44 Piscium. Its centre would be about half way from ζ Piscium

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to a point two thirds of the way from 20 Ceti to f Piscium. Place of 20 Ceti $0^h 46^m.4$, $-1° 48'$



" " f Psc. 1 11.6, +2 59
" " intermediate point 1 3.4, +1 23
" " δ Psc. 0 42.5, +6 56
" " Gegenschein 0 53.0, +4 10

6, 3 A.M. Yesterday clear and cool; aurora most of the evening, not now visible, or at most suspected; arch with sky not specially dark below, and occasional streamers. Gegenschein suspected at 10 P.M. and at 2 A.M. Today, much as last night; centre half way from δ Piscium to 29 Ceti (B.A.C. 324; a star visible in the sky and in the Atlas of Heis, but not found in his catalogue.)

Place of δ Piscium $0^h 42^m.5$, $+6° 56'$
" " 29 Ceti 1 1.8, +1 38
" " Gegenschein 0 52.2, +4 17

Instead of 29 Ceti, the star may be 33 Ceti ($1^h 4^m.5$, $+1° 47'$), which is in Heis; but the place on the map seems to be due south of ε Piscium. It is within the boundary of Pisces according to the map.

7, 9¾ A.M. Yesterday cool and somewhat cloudy; thin clouds and irregular haze in the evening, but stars somewhat visible; no aurora seen.

8, 12¾ A.M. Yesterday clear and warm; evening cool, with increasing fog; now foggy and cloudy.

8, 8¼ P.M. Dry rather dim and warm; evening hazy; cloudy near horizon, especially in the north; faint lunar halo. α Aquarii now on inner edge of halo.

9, 10 A.M. Clearer at 10½ P.M. last night; no aurora seen.

α Capric. α 303°, δ −13°; Moon α 281°.5, δ −18°; hence radius of halo about 22° (from a chart).

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October, 1883.

9, 10¼ P.M. Day mostly rather clear and warm; evening nearly clear; auroral light slightly suspected, but at all events faint and not appearing certainly in the moonlight.

10, 11 P.M. Day mostly clear and warm; evening somewhat foggy; no aurora seen.

11, 11 P.M. Day warm and mostly rather clear; evening rather clear, with frequent thin clouds; no aurora seen.

13, 10 A.M. Yesterday cloudy day and evening, with a little rain.

14, 9¾ A.M. Yesterday cloudy and rather hot, day and evening.

14, 10½ P.M. Day rather hot and somewhat cloudy, with a thunder shower about 3¼ P.M.; evening partly clear; no aurora seen.

16, 12½ A.M. Meteorological record made at this time on p. 63 under date of Oct. 15, 12½ P.M. Day mostly clear and cool; evening clear after 7 P.M.; aurora visible about midnight, notwithstanding moonlight.

16, 11 P.M. Day and evening clear and cool; much auroral light 10 to 11 P.M.; some red light, apparently, at times; too much moonlight to let it appear distinctly.

17 11¼ P.M. Day and evening clear and cool; no aurora seen.

18, 9 P.M. Day clear and cool; clouds came on from the south about 8½ P.M.; no aurora seen.

20, 10¼ A.M. Yesterday cloudy and warm day and evening; partly clear 2½ to 3½ A.M. today; rain later.

21, 9¾ A.M. Yesterday cloudy and warm day and evening, with a little rain.

21, 11 P.M. Day mostly cloudy; evening rather clear, with some haze; no aurora seen.

22, 10½ P.M. Day rather clear and cool; evening hazy; no aurora seen; some clouds near horizon.

24 9¾ A.M. Yesterday mostly cloudy and cool; rain in the evening after 10 P.M.

25, 10 A.M. Yesterday cloudy day and evening with some rain.

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26, 10 A.M. Yesterday cloudy day and evening, with a few drops of rain.

26, 11 11/12 P.M. Day cloudy with rain, evening rather clear, but hazy; no aurora seen; zodiacal light suspected early in the evening.

27, 12 1/4 A.M. Hazy, and band from Pleiades not visible west of ν Piscium; but between ν Piscium and δ Arietis it seems to extend farther north than usual and to form a sort of rounded expansion. If this is Gegenschein the centre is half way from β Arietis ~~and~~ to ξ² Ceti, and the boundaries nearly reach these stars. The lower edge is pretty well defined, along the boundary of Aries and Cetus. Place of β Arietis 1ʰ 48ᵐ.0 +20° 13′
" " ξ² Ceti 2 21.8 +7 53
" " Gegenschein 2 4.9 +14 4

28, 9 1/2 A.M. Yesterday cloudy day and evening.

29, 10 1/4 A.M. Yesterday cloudy; evening hazy at first, cloudy later.

30, 10 A.M. Yesterday cloudy, with strong southy wind and rain.

30, 11 3/11 P.M. Day clear and warm; evening hazy, with occasional clouds; band from Pleiades hardly visible; zodiacal light in Capricornus suspected about 8 P.M.; no aurora seen.

Nov. 1, 10 A.M. Yesterday rather cloudy with a little rain towards night; evening rather cloudy, partly clear at times; no aurora seen.

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Report to Signal Service, sent Nov. 1, 1883.

Aurora looked for every clear evening; results as follows:

Oct. 5. Aurora most of the evening; arch with sky not specially dark below, and occasional streamers.

Oct. 9. Auroral light slightly suspected, but too faint to appear certainly in the moonlight.

Oct. 15. Aurora visible about midnight this evening, notwithstanding moonlight.

Oct. 16. Much auroral light 10 to 11 P.M.; apparently some red light at times; too much moonlight to let it appear distinctly.

Zodiacal light suspected early in the evenings of Oct. 26 and 30; conspicuous in the morning of Oct. 4.

Lunar halo noticed Oct. 8, at 8¼ P.M.

Frost. Reading of minimum thermometer below the freezing point on the mornings of Oct. 6, 16, 17, 18, 22, 23,

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Observations of Gegenschein by Prof. E. E. Barnard, Nashville, Tenn.
See his letters, 1883, Oct. 8, 18, 30, Nov. 20

1883 Oct. 8 $0^h\ 50^m$, $+6°$ (by Burritt's Atlas, epoch thought to be about 1820)
Oct. 29 $2^h\ 5^m$, $+15°$ (" " " " " " ")
Nov. 18 (8 P.M.) $3^h\ 25^m\ 00$ $3^h\ 30^m$, $+19°$ (" " " " " " ")

See also Sidereal Messenger for November, 1883, Vol. II. p. 254.

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November, 1883.

Date	Time a.m.	Barometer	Attached Thermometer	Wet	Minimum before	Minimum after setting	Maximum before	Maximum after setting	Gauge.	Rainfall in inches	Wind	Clouds.
1	10	29.739	48.4	44.6	36.1	43.8	57.0	45.3	0 1/4	0.022	2 SW	1 Pm
2	9 3/4	29.832	45.9	41.1	34.6	40.3	49.0	41.3	0		2 NW	10 Pm M fm →
3	10	30.162	43.6	40.4	30.4	39.9	44.6	40.8	0		2 NW	0 Pm Rs
4	9 1/2	30.058	44.9	45.5	33.3	44.9	45.5	45.4	0		1 SW	10 Pm
5	10	30.318	46.6	47.4	33.9	46.8	55.3	47.3	0		1 SW	0
6	9 1/2	30.020	51.0	54.3	44.0	53.8	59.0	54.2	0		2 SW	8 P Rs fm
7	9 3/4	29.915	52.1	46.4	44.2	45.7	64.0	46.8	0		3 NW	8 Pr Rs
8	10	30.029	45.3	37.6	29.8	37.1	50.0	38.1	0		0 N	0 Rs
9	10	29.900	49.0	50.1	37.0	49.2	49.6	49.6	0		0 calm	9 P fog
10	10	29.876	53.8	53.0	47.4	52.2	57.0	53.0	2 5/8	0.232	1 SW	10 Pm
11	9 3/4	29.966	52.7	52.5	46.4	51.9	55.8	52.9	0 5/8	0.055	1 W	10 P fm →
12	10 3/4	29.520	45.1	38.0	37.1	37.1	56.5	38.6	0 1/2	0.044	4 W	5 Pm M fm →
13	10 3/4	29.760	36.4	34.6	26.0	34.0	38.7	34.6	0		4 NW	0 Rs
14	10 1/4	29.582	44.0	44.5	33.9	43.5	44.5	44.2	0 1/4	0.022	2 W	10 Pm fm →
15	10	30.190	37.2	26.6	20.9	26.1	44.2	27.4	0		1 N	0 Rs
16												
17	10 1/4	30.127	34.7	28.3	16.2	27.8	34.0	29.7	0		2 SW	1 Pm fm
18	9 3/4	30.288	38.1	36.2	27.9	35.5	37.5	36.4	0		1 SW	0 Rs
19	10 3/4 Eastern Time	30.284	42.8	45.1	31.1	44.2	48.7	44.8	0		1 S	2 Pm fm
20	9 3/4 Eastern Time	30.340	43.8	40.4	32.3	40.0	52.8	40.7	0		0 W	5 P Rs
21	9 1/4 Eastern Time	30.242	47.6	53.3	39.7	52.4	54.0	52.7	0		1 S	10 Pm fm
22	9 Eastern Time	29.989	53.7	64.0	52.2	63.1	63.2	62.4	0		2 S	10 Pm fm
23	10 3/4 Eastern Time	30.091	55.7	50.6	49.9	49.9	66.4	50.6	1	0.088	2 N	10 Pm
24	10 1/4 Eastern Time	30.134	49.8	46.1	42.5	45.3	50.7	46.3	1	0.088	1 NE	10 Pm
25	9 3/4 Eastern Time	30.472	45.8	40.7	36.2	40.0	46.4	41.0	0		2 N	5 Pr Rs
26	10 Eastern Time	30.462	45.5	44.6	30.2	43.8	46.6	44.7	0		2 E	10 Pm fm ←
27	9 3/4 Eastern Time	30.194	47.6	42.9	40.2	42.1	47.1	43.2	15 7/8	1.401	2 NW	5 Rs fm
28	10 1/4 Eastern Time	30.298	40.0	32.8	24.2	32.2	43.4	33.7	0		0 SW	0
29	10 Eastern Time	30.402	36.0	21.6	17.3	20.8	42.7	24.0	0		2 N	1 P Rs haze
30	10 Eastern Time	29.832	38.0	44.0	20.6	43.2	43.7	43.2	0		2 S	10 P
	10.1	871.342 30.046 -.045 30.001	1315.5 45.3	1247.2 43.0	995.5 34.3	1220.6 42.3	1449.9 50.0	Max. set inside building	22 1/8	1.952 Rainfall for month 1.95 inches.	46 1.6	160 5.5

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Date	Time P. M.	Barometer	attached Thermometer	No. 4	Wind	Clouds.	Time P. M.	Zodiacal light.	Time P. M.	Aurora.	Report & Sigsbee
1	8½	29.754	49.4	40.2	1 SW	1 Pm haze	8½	Cloudy	8½	Light-cirrus clouds	Aurora
2	11¼	30.054	46.7	34.8	1 NW	5 Pm Fm	11¼	Cloudy	11¼	Diffused light	Aurora
3	9½	30.099	43.3	34.2	1 SW	6 P haze	9½	Hazy	9½	Hazy	None
4	9¾	30.209	50.0	42.5	1 S	1 haze	9¾	Hazy	9¾	None	None
5	8½	30.240	54.0	48.7	1 S	0	8½	Moonlight	8½	Moonlight	Aurora
6	9½	29.836	56.2	54.7	2 SW	10 Pm Fm	9½	Cloudy	9½	Cloudy	None
7	8¾	29.996	50.2	38.0	2 NW	0	8¾	Moonlight	8¾	Moonlight	None
8	11½	29.941	49.3	42.4	0 S	10 Pm Fm →	11½	Cloudy	11½	Cloudy	None
9	11½	29.555	53.5	57.3	4 S	1 Pm Fm	11½	Moonlight	11½	Moonlight	None
10											Obsc.
11											Obsc.
12	11¼	29.508	36.2	28.3	5 W	0	11¼	Moonlight	11¼	Moonlight	None
13											Obsc.
14	9	29.913	38.8	30.4	3 NW	0	9	Moonlight	9	Moonlight	None
15											Obsc.
16	11	30.379	33.3	21.8	1 SW	0	11	Moonlight	11	Moonlight	None
17	11¾	30.252	39.4	32.3	3 S	0	11¾	Moonlight	11¾	Moonlight	None
18	10 Eastern Time	30.270	44.8	36.8	0 calm	0 P Rs	10 Eastern Time	Moonlight	10 Eastern Time	Moonlight	None
19											None
20											None
21											Obsc.
22											Obsc.
23											Obsc.
24											None
25	11½ Eastern Time	30.536	47.0	34.2	1 N	1 P Rs	11½ Eastern Time	Hazy	11½ Eastern Time	Hazy	None
26											Obsc.
27	8½ Eastern Time	30.400	44.0	32.8	2 N	0 haze	8½ Eastern Time	None	8½ Eastern Time	None	None
28	9½ Eastern Time	30.189	43.4	35.3	3 N	2 P haze	9½ Eastern Time	Hazy	9½ Eastern Time	Hazy	None
29	10½ Eastern Time	30.193	37.8	26.1	2 SW	5 P. haze	10½ Eastern Time	Hazy	10½ Eastern Time	Hazy	None
30	8½ Eastern Time	29.858	43.4	39.7	1 W	3 P haze	8½ Eastern Time	Suspected, hazy	8½ Eastern Time	Hazy	None

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November, 1883.

2, 12½ A.M. Yesterday mostly rather clear; evening clear at times with frequent clouds. Aurora all the evening with occasional streamers among clouds; particularly bright about 9 P.M.; a little red light then suspected, but this may have been due to contrast between the bright greenish light below and the dark clouds on the border of which the reddish tint appeared. A little lightning suspected in the south on the evening of Nov. 1.

2, 8½ P.M. Extensive irregular, and variable aurora among clouds; bright and in form of curtain in the northwest about 8¼ P.M.

2, 11¼ P.M. Day rather cloudy and cold; evening rather clear at times, sometimes cloudy; aurora continues, not very bright, but rather extensive, diffused, and irregular.

3, 9½ P.M. Day mostly rather clear; evening hazy, with clouds near horizon; haze increasing; no aurora seen; band from Pleiades somewhat visible as late as 9 P.M.

4, 9¾ P.M. Day cloudy at first, hazy afternoon; evening rather clear, but with some haze; no aurora seen; band from Pleiades hardly visible.

5, 11½ P.M. Day and evening rather clear and warm; slight aurora noticed by Prof. Pickering about 10 P.M.; band from Pleiades not now traceable beyond ν Piscium; it is pretty wide between β Arietis and ξ² Ceti, but perhaps there is a change since Oct. 27. The observation of that date, however, is doubtful.

6, 9½ P.M. Day warm and clear early; rather cloudy later; nearly clear 7½ to 9½ P.M., afterwards mostly cloudy; no aurora seen.

7, 11 P.M. Day mostly clear and cool; evening clear; no aurora seen.

8, 11½ P.M. Day mostly clear and cool; evening mostly cloudy,

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rather clear early; no aurora seen.

9, 11½ P.M. Day warm and cloudy with some rain; mostly clear about 11 P.M.; no aurora seen.

11, 9¾ A.M. Yesterday cloudy and warm, with a little rain.

12, 10¾ A.M. Yesterday cloudy and warm, with a little rain; clear today at 3 A.M.; cloudy again soon after 4 A.M.

12, 11¼ P.M. Day windy and cold with some clouds and a snow squall about 2 P.M.; evening clear and windy; no aurora seen.

14, 10¼ A.M. Yesterday mostly clear and cool; evening cloudy.

14, 9 P.M. Cloudy at first, clear towards night; evening clear; no aurora seen.

16, 11½ A.M. Barom. 29.968; attached therm. 37.2; No. 4, 29.3; minimum (not set) 22.3; maximum (not set) 34.0; wind 3 NW; clouds 8 Pa Ro Fm ; gauge 0. Yesterday clear at first, soon rather cloudy; evening cloudy; a little snow late in the night or early today.

16, 11 P.M. Day rather cloudy at first, becoming clear and cold; evening clear; no aurora seen; zodiacal light somewhat visible in Capricornus before moonrise.

17, 11¾ P.M. Day and evening clear; no aurora seen; zodiacal light slightly visible early.

18, 10 P.M. (Eastern Time). Day and evening clear, not cold; no aurora seen; zodiacal light slightly visible about 8 P.M. and earlier; band from the Pleiades moderately well seen; the maxima in Pisces and Aries noticed earlier in the autumn at different times do not now exist, apparently. The known maximum near δ Arietis seems to be permanent.

20, 9¾ A.M. (Eastern Time). Yesterday rather clear, but with clouds at times; evening rather cloudy, generally partly clear; no aurora seen.

21, 9¾ A.M. (Eastern Time). Yesterday somewhat cloudy and warm. Evening

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November, 1883.

partly clear, but hazy; haze thickening; no aurora seen.
23, 10½ A.M. (Eastern Time). Yesterday and previous day warm and mostly cloudy.
24, 10½ A.M. (Eastern Time). Yesterday cloudy day and evening with a little rain.
25, 9¾ A.M. (Eastern Time). Yesterday cloudy day and early evening; somewhat clear at 11 P.M. and later; no aurora seen.
25, 11½ P.M. (Eastern Time). Day clear and cool; evening mostly clear, but hazy and somewhat cloudy after 10½ P.M. No aurora seen; Zodiacal light visible early in the evening with dark triangular space between it and band from Aquila as usual. Tried experiment suggested by a recent observation of supposed Gegenschein by E. E. Barnard. On turning the head in different ways, there seemed to be a light above Saturn, that is, on the side of Saturn towards the forehead, which could be perceived only by indirect vision. It is possible that there may be some internal reflection in the eye which will produce such an effect. It will be well to try the experiment with Jupiter or Venus as the object. Experiment tried with Jupiter and Sirius; same result; see note p. 75.
27, 9¾ A.M. (Eastern Time). Yesterday cloudy; evening raining.
27, 10¼ P.M. (Eastern Time). Day rather clear and cool; evening clear, slightly hazy. no aurora seen; Zodiacal light visible about 7 P.M.; its N. edge nearly reaching band from Aquila. Experiments on looking near Saturn as on Nov. 25, with similar result; tried removing hat, and found that this did not affect the result. The appearance of light, however, is a mere suspicion, and may be imaginary.

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November, 1883.

28, 11½ P.M. (Eastern Time). Day mostly clear; evening rather clear, but hazy; no aurora seen; zodiacal light slightly visible early.

29, 10¾ P.M. (Eastern Time). Day and early evening clear and cold; clouds and haze later; no aurora seen.

30, 11¼ P.M. (Eastern Time) Day cloudy; evening clear after 7 P.M., but hazy; no aurora seen; zodiacal light suspected at 8½ P.M. (Eastern Time).

On several occasions towards the end of the month the experiment described p. 74 was tried with Saturn, Jupiter, and once with Sirius. It seems to be a general rule that by indirect vision a suspicion of light above a bright star (that is, towards the forehead) may be produced, however the head is held. But O. C. Wendell found no such appearance.

Report to Signal Service.

Aurora looked for every clear evening; results as follows:
Nov. 1. Aurora all the evening, with occasional streamers among clouds; particularly bright about 9 P.M.; a little red light then suspected.
Nov. 2. Extensive, irregular, and variable aurora among clouds; bright, and in form of curtain in the northwest, about 8¼ P.M.; continuing at 11¼ P.M., not very bright.
Nov. 5. Slight auroras noticed about 10 P.M.

Zodiacal light visible early in the evening Nov. 16, 17, 18, 25, 27, 28; suspected Nov. 30, in haze.

Lightning suspected in the south on the evening of Nov. 1. (Thunder shower Oct. 14, about 3¼ P.M.; not mentioned, by oversight, in report for October).

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Eastern Time.

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December, 1883

Date	Time A. M.	Barometer	attached Thermometer	No. 4	Minimum before sunrise	Minimum after sunrise	Maximum before sunset	Maximum after sunset	Gauge	Rainfall in inches	Wind	Clouds
1	10 1/4	30.109	37.8	27.2	20.1	26.3	48.4	28.0	0		2 N	1 P 7m L
2	10	29.533	38.1	38.8	26.2	38.0	38.8	38.3	0 1/4	0.022	0 W	10 P; raining
3	10	30.032	28.3	14.9	11.0	14.2	39.0	16.4	1 3/4	0.154	3 NW	0 7m
4	10	30.248	31.2	26.8	14.1	26.2	27.0	27.3	0		1 S	0
5	9 1/2	29.931	37.0	37.0	26.3	36.2	36.4	36.4	0 3/8	0.033	0 S	10 P
6	9 1/2	30.320	37.7	36.5	32.8	36.0	41.8	36.8	0 1/4	0.022	2 N	0
7	10	30.503	37.9	38.2	24.5	37.4	41.9	38.3	0		1 S	5 P Rs
8	10	30.178	43.3	49.8	37.3	48.8	49.4	49.0	0 1/8	0.011	1 S	10 Pm; a little rain
9	9 3/4	30.077	47.8	44.0	43.3	43.3	54.8	44.2	0 3/4	0.066	0 W	9 P Rs
10	9 1/2	30.104	41.2	33.3	28.0	32.8	45.2	34.3	0		1 SW	0 P haze
11	10	29.980	36.6	29.1	27.2	28.5	44.0	30.0	0		2 NW	1 Rs 7m
12	10	30.057	36.5	27.5	23.2	27.0	32.3	28.3	0		2 N	0 7m
13	10	29.976	37.1	35.4	23.7	34.7	35.0	35.2	0		3 SW	0 haze
14	9 3/4	29.520	42.8	47.1	34.5	46.2	46.7	46.3	0		2 SW	10 Pm 7m
15	9 3/4	29.634	36.0	16.9	16.2	16.2	51.2	19.0	0		3 NW	0 7m
16	9 1/2	30.008	21.0	8.8	0.2	8.3	19.0	10.3	0		1 SW	0
17	9 3/4	29.638	29.0	19.7	8.3	19.0	23.0	20.4	Sep. 77		3 N	10 P; snowing
18	9 3/4	29.890	27.8	23.4	10.0	22.8	24.0	24.0	Sep. 79		1 SE	10 P; snowing
19	10	30.241	33.2	27.1	22.5	26.1	35.7	27.5	Sep. 79	0.951	1 NW	10 P; snowing
20	10	30.378	29.9	19.8	18.0	19.1	27.6	21.0	Sep. 80	0.434	2 N	9 P 7m
21	10	29.952	27.7	15.1	13.8	14.4	22.4	16.2	Sep. 80		2 N	10 P; snowing
22	10	30.032	21.9	12.7	10.8	11.3	18.0	13.5	Sep. 80		2 NW	0
23	9 1/2	30.550	out of sight to the left	−10.1	−14.0	−10.5	14.0	Below graduation			1 NW	0 Rs
24	10	29.912	18.8	15.6	−10.5	14.7	15.6	16.0	Sep. 80		1 NW	10 P; snowing
25	10 3/4	29.912	26.6	26.4	14.5	25.9	26.3	26.3	Sep. 81	1.211	2 N	10 R Rs
26	—	—	—	—	—	—	—	—	Sep. 81	0.305	—	—
27	9 3/4	29.918	32.0	35.5	23.0	34.6	35.0	35.0	0		0 calm	10 P fog
28	10 1/4	29.310	33.6	24.5	23.2	24.0	44.2	25.7	4 1/4	0.375	3 W	6 R Rs 7m
29	10 1/4	30.061	29.2	24.9	15.6	24.2	27.0	26.0	0		1 SW	0
30	—	—	—	—	—	—	—	—	—		—	—
31	10	30.162	31.7	28.1	17.1	27.5	31.8	28.5	0		1 N	10 P
	9.9	870.166 30.006 29.996	941.1 32.4	673.5 23.2	540.9 18.6	753.3 26.0	995.5 34.3	Max. at single building	See 74, 80, 81	3.584 Rainfall for month 3.58 inches	44 1.5	151 5.2

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December, 1883.

Date	Eastern Time P.M.	Barometer	Attached Thermometer	No. 4	Wind	Clouds	Eastern Time P.M.	Zodiacal Light	Eastern Time P.M.	Aurora	Report to Signal Service.
1	10	29.913	38.8	27.8	2 SE	9 Phaze	10	Hazy	10	Hazy	None
2	10¼	29.720	36.2	26.5	3 NW	4 haze	10¼	Hazy	10¼	Hazy	None
3	8½	30.147	29.3	19.8	2 W	0 haze	8½	Suspected	8½	None	None
4	9	30.122	39.0	30.7	0 N	10 P	9	Cloudy	9	Cloudy	None
5											None
6	11	30.514	40.8	29.8	1 S	0	11	Moonlight	11	Moonlight	None
7											None
8											Obsc.
9											None
10	10½	29.888	44.8	37.0	1 SW	10 Ru	10½	Cloudy	10½	Cloudy	None
11											Obsc.
12	8½	30.168	38.8	25.2	1 SW	1 P R Rs	8½	Moonlight and clouds	8½	Moonlight and clouds	None
13	8½	29.800	43.2	39.7	2 SW	5 P R Rs	8½	Moonlight and clouds	8½	Moonlight and clouds	None
14											Obsc.
15	11	29.900	24.5	1.7	2 NW	0	11	Moonlight	11	Moonlight	None
16											Obsc.
17	8¾	29.823	30.2	18.3	1 W	1 Phaze	8¾	Hazy	8¾	Hazy	Obsc.
18											Obsc.
19											Obsc.
20											Obsc.
21	9	29.802	26.0	13.4	2 SW	5 Phaze	9	Hazy	9	Hazy	None
22	9½	30.233	18.3	0.3	2 NW	0	9½	Suspected	9½	None	None
23											Obsc.
24											Obsc.
25											Obsc.
26											Obsc.
27											Obsc.
28	8½	29.662	30.8	21.4	2 W	0	8½	Visible	8½	None	None
29	8¼	30.164	33.4	23.4	0 calm	1 Phaze	8¼	Hazy	8¼	Hazy	None
30											Obsc.
31	11½	30.181	30.6	25.6	2 N	10 P a little snow	11½	Cloudy	11½	Cloudy	Obsc.

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78 Eastern Time. December 1883.

1, 10 P.M. Day mostly cloudy and chilly: evening partly clear; thick haze coming on after 9½ P.M.; no aurora seen.

2, 11½ A.M. Barom. 29.510; attached therm. 38.7; No. 4, 39.1.

2, 10¼ P.M. Day cloudy with a little rain early; clearing off towards night; evening rather clear, with passing clouds, and afterwards haze; no aurora seen.

3, 11 P.M. Day clear and cold; evening clear, but somewhat hazy; clouds now gathering; no aurora seen.

4, 9 P.M. Day clear and cool; clouds came on soon after 7 P.M.; no aurora seen.

5, 9½ A.M. Yesterday evening: partly clear at 11 P.M.; cloudy again later.

6, 9½ A.M. Yesterday cloudy and cool; a little rain; evening cloudy, somewhat clear about 10 P.M.; no aurora seen.

6, 11 P.M. Day and evening mostly clear and cool; no aurora seen.

8, 10 A.M. Yesterday rather cloudy and warm; evening mostly cloudy, but clouds thin and broken, many stars visible; no aurora seen.

9, 9¾ A.M. Yesterday cloudy and warm day and evening, with a little rain.

10, 9½ A.M. Yesterday cloudy; evening partly clear at times; no aurora seen.

10, 6 P.M. Answers to questions relating to thermometers, proposed by Signal Office, answered today as follows:

Height of bulbs above ground, 5½ feet.
Distance of nearest building or tree, 6 inches.
Thermometers, always in shade.
" have northern exposure.
Shelter about 29 inches high, 24 inches wide, 21 inches deep (from front to rear); sides and roof of one thickness of board; north end closed by blinds; no bottom; south end open against window on north side of room containing meridian circle.
Thermometers not exposed on roof.
" often wet by snow, seldom

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Eastern Time

by rain (in driving storms).

Two small sketches added to show place of shelter on plan of Observatory, and section of shelter seen from the west.

The ground north of the building is mostly open, with some trees and houses, but none near; grass grows on the ground below the shelter.

10, 10½ P.M. Day clear at first, cloudy later; nearly clear about 8 P.M.; occasional clouds from the northwest; cloudy after 10 P.M.; no aurora seen.

13, 8½ P.M. Dec. 11 clear at first evening; mostly cloudy; clear for a time about 5 A.M. Dec. 12; that day mostly clear; some clouds in the evening, becoming generally cloudy about 9½ P.M.; today clear, evening somewhat cloudy; no aurora seen yesterday or today.

14, 9¾ A.M. Clouds increasing late yesterday evening.

15, 9¾ A.M. Yesterday cloudy day and evening, with a few drops of rain.

15, 11 P.M. Day and evening clear and cold; no aurora seen.

17, 9¾ A.M. Yesterday clear, becoming cloudy with snow in the evening; snow now about 5 inches deep.

17, 10½ P.M. Day rather cold and cloudy, with snow; clear after 7 P.M.; no aurora seen.

18, 9¾ A.M. Snow measured in 5 places 9, 8½, 10, 8½, 9; mean 9.00 inches.

18, 4½ P.M. Snow measured in 10 places 6, 7, 6¾, 7, 7½, 9, 8, 8½, 8, 9; mean 7.675 inches. 21 inches of this snow in cylinder 1 13/16 inches across weigh 3⅞ ounces.

9.82714 9.09319
8.67778 10.85504
0.15492 9.94823

Hence rainfall to 1 inch of snow 0.1239 inches, total rainfall 0.951 inches. Gauge cleared out.

19, 10 A.M. Yesterday cloudy day and evening, with a little snow before noon; this morning cloudy, with snow very little as yet.

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December, 1883.

Eastern Time

20, 10 A.M. Yesterday cloudy day and evening, with some snow. The new snow this morning may be estimated as 3½ inches deep; there are no means of measuring it correctly; it is of about the same density as that previously fallen. By estimate, rainfall 0.434 inches.

21, 10 A.M. Yesterday clear after 10 A.M.; cloudy again towards night; evening cloudy; about 2 inches of new snow now fallen.

21, 9¾ P.M. Day cloudy and snowy, clearing off about 5 P.M.; evening clear at first, then hazy and at times cloudy; no aurora seen; Zodiacal light visible early.

22, 10 A.M. Snow of yesterday apparently about 5 inches deep.

23, 12½ A.M. Yesterday clear and cold day and evening; No. 4 now −4.0; no aurora seen.

23, 11½ A.M. No. 4 now −5.3.

23, 5 P.M. No. 4 now +0.4. Day clear at first, becoming cloudy during the afternoon.

23, 7 P.M. No. 4 now +0.2.

23, 10 P.M. No. 4 now +1.1. Evening cloudy.

24, 10 A.M. New snow about 2 inches deep.

24, 5 P.M. Day cloudy with snow, changing to sleet and freezing rain; temperature rising slowly; No. 4 now 22.2. Not now snowing or raining; but still cloudy. Gauge cleared out. New snow 3 inches deep; 11½ inches in cylinder 1 13/16 inches across receiving 3 3/8 ounces. 9.82714 9.29247 / 8.93930 6.47712 / 9.52827 9.77183 Hence rainfall to 1 inch of snow 0.1970 inches; total rainfall 0.591 inches. If the snow of Dec. 21 is considered as 5 inches at 0.1239 inches of rainfall to the inch of snow, the rainfall of that day is 0.620 inches.

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Eastern Time

25, 10¾ A.M. Yesterday evening cloudy; partly clear about 11 P.M., but still cloudy near horizon. Nothing in gauge this morning; the rainfall since 10 A.M. Dec. 20 may be estimated from the preceding data as 1.211 inches.

26, 11¼ A.M. Barom. 30.050; attached therm. 30.0; No. 4, 31.4; minimum 25.3 (not set); maximum 31.0 (not set); wind 1 SW; clouds 1 P 1m. Yesterday cloudy, with snow in the evening; new snow this morning 3¾ inches, 23 inches in cylinder 1 13/16 inches across weigh 3¼ ounces.
9.827 14 4.96026
8.638 27 0.87403
0.49185 9.53429
Hence rainfall to 1 inch of snow 0.0913 inches; total rainfall 0.342 inches. Gauge 3¼ ounces; 0.267 inches; as there was little wind, the mean of the two results, 0.305 inches, is adopted.

26, 12 M. No. 4 in ice and water 32.4

26, 1 P.M. No. 4 in ice and water 32.4. Psychrometer (covered bulb) 32.0.

27, 9¾ A.M. Yesterday mostly clear; evening cloudy; stars sometimes seen.

28, 10¼ A.M. Yesterday cloudy day and evening with fog and rain; lightning and distant thunder (the sound apparently from the south) between 7½ and 8 P.M.

28, 11¾ P.M. Day clear; evening clear, somewhat hazy; no aurora seen; zodiacal light visible early.

29, 10½ P.M. Day clear; evening becoming hazy and somewhat cloudy after 8 P.M.; no aurora seen; zodiacal light visible early.

30, 12½ P.M. Barom. 30.099; attached therm. 30.7; No. 4, 31.9; minimum 17.2 (not set); maximum 31.7 (not set); wind 2 NE; clouds 10 P; gauge 0. Clear part of the night; cloudy after 5 A.M.

31, 10 A.M. Yesterday cloudy day and evening.

31, 11½ P.M. Day cloudy and rather chilly, with a little snow in the evening.

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December, 1883.

Report to Signal Service, Sent Jan. 1, 1884.

Aurora Looked for every clear evening; none seen.

Zodiacal light visible early in the evenings of Dec. 21, 28, 29; suspected at 8½ P.M. Dec. 2, and at 6½ P.M. Dec. 22; observations mostly hindered by moonlight or clouds.

Thunder and lightning. Dec. 27, cloudy, with fog and rain; lightning and distant thunder (the sound apparently from the south) between 7½ and 8 P.M. (Eastern Time).

Low temperature. The minimum thermometer indicated −14°.0 Fahrenheit on the morning of Dec. 23.

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General remarks on Observations for 1883.

Range of barometer and of temperature.

The highest and lowest (uncorrected) reading of the barometer for each month, with the corresponding reading of the attached thermometer, are given below. As the barometer was usually read only once or twice a day, these readings may differ considerably from the actual maxima and minima for the successive months. The highest reading for each month of the maximum thermometer (Casella 13399) and the lowest reading of the minimum thermometer (Green 2205), both uncorrected, are also given below.

	Barometer. Maxima.				Minima.				Temperature. Max.		Min.	
	Date	Time	Barom.	Attached therm.	Date	Time	Barom.	Attached therm.	Date	C.13399	Date	G.2205
January	16	10 A.M.	30.456	24.8	21	9¾ A.M.	29.464	33.0	22	42.2	23	−1.0
February	24	9¾ A.M.	30.660	18.0	7	10¾ A.M.	29.428	30.7	18	51.9	24	5.1
March	1	10 A.M.	30.344	22.7	10	6¾ P.M.	29.000	31.9	19	54.0	9	1.6
April	14	10 A.M.	30.476	44.6	20	10 A.M.	29.650	51.6	11	66.3	1	20.0
May	1	9 P.M.	30.408	51.8	15	10 A.M.	29.553	52.0	26	77.2	1	32.2
June	2	9½ A.M.	30.522	61.0	11	11¼ P.M.	29.588	75.4	14	86.8	3	45.5
July	21	9¾ A.M.	30.238	68.7	24	9¾ A.M.	29.790	71.8	5	92.0	1	49.7
August	15	9¾ A.M.	30.345	66.7	3	10 A.M.	29.727	71.0	24	89.6	28	45.3
September	10	10¼ A.M.	30.404	54.2	25	10½ A.M.	29.381	63.0	18	78.2	11	39.0
October	17	10 A.M.	30.624	43.0	30	10 A.M.	29.380	58.2	15	77.7	18,23	26.2
November	26	10 A.M.	30.482	45.5	12	11¼ P.M.	29.508	36.2	23	66.4	17	16.2
December	23	9½ A.M.	30.550	10.0	28	10¼ A.M.	29.310	33.6	9	54.8	23	−14.0

Range of barometer 30.660 Feb. 24 to 29.000 March 10.
" " temperature 92.0 July 5 to −14.0 Dec. 23.

Observers

A. Searle usually; O. C. Wendell July 29, 11½ P.M., July 30, 9¾ A.M., and August 20, 7½ P.M., to August 27, 9 A.M., inclusive.

Times of observation

Observations made 9 to 10 A.M. and occasionally at other times, especially on clear evenings; time recorded with each observation. In the evening observations recorded on the second page of the record for each month, the time given in the second column is that at which the entire record was made; the columns headed "Time" just preceding

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the columns headed "Zodiacal light" and "Aurora", contain the times to which the record of these phenomena relates; but the record itself was made at the time given in the second column on the page, as already explained.

Change of time — The mean time clock of the Observatory was set back on November 18 to effect the change made on that day in the reckoning of local time. The times given in the meteorological record denote Boston mean time until noon of November 18, and "Eastern Time" (5h slow of Greenwich) afterwards.

Instruments — Barometer J. Newman, No. 68; external thermometer No. 4; maximum thermometer Casella 13399; minimum thermometer Green 2205; vane; rain gauge; all as described in book Q 5, just before the record for 1878. See also references given in the general remarks on the observations of 1882, book R 67, p. 216.

Thermometer No. 4 — See remarks just mentioned. The freezing point of the instrument appeared to be 32.4 by an observation made on December 26, 1883; see p. 81; but see also p. 101 for evidence tending to show that the true reading was 32.3 as before.

Wind — recorded as in 1880; see pp. 50, 51, of book R 67; also pencil memorandum on inside of cover of this book.

Clouds — Observations of clouds recorded on the system adopted at the beginning of 1877; see record for January and February of that year in book Q 4; also book Q 5, p. 4.

Reductions — See general remarks on observations of 1882, book R 67, p. 216. The reductions for 1883 were made mostly by Mr. C. C. Eaton.

Reports to the Signal Service — The results reported monthly to the Signal Service are also recorded in this book; see book R 67, p. 51.

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January 1884.

Date	Time A.M.	Barometer	Attached Thermometer	No. 14	Minimum before and after setting		Maximum before and after setting		Gauge	Rainfall in inches	Wind	Clouds	Date
1	9.9	30.138	30.3	23.7	22.2	23.0	28.7	25.0	sep. 88		2 NE	10 Pz; snowing	1
2	10.2	29.624	33.6	37.2	23.0	36.5	37.0	36.8	7 1/8	0.629	2 NE	10 P; raining	2
3	10.5	29.599	32.6	26.5	20.5	25.9	39.0	27.7	sep. 88 0 3/8	0.938 0.033	2 SW	0 Fm	3
4	10.0	29.962	25.8	12.8	8.1	12.0	29.0	15.4	0		3 SW	3 Rs	4
5	10.8	29.958	23.0	12.3	5.2	11.6	16.0	14.5	0		2 W	10 R	5
6	10.1	29.925	18.0	1.8	−2.3	1.2	15.0	4.5	0		2 NW	0	6
7	10.3	30.412	19.6	9.7	1.1	9.0	13.0	11.0	0		1 W	0	7
8	9.8	30.563	20.0	8.0	0.9	7.1	18.0	10.0	0		1 NW	1 Rs haze	8
9	10.1	29.151	33.9	46.3	7.1	45.2	45.6	44.0	20 3/8	1.798	1 SE	10 Pm	9
10	10.0	29.737	31.7	29.2	24.3	28.6	46.2	29.5	0		3 W	3 Fm → haze	10
11	10.0	29.809	34.0	38.6	26.1	37.8	38.2	38.0	0		2 SW	4 PRs Fm	11
12	10.0	29.989	29.4	16.4	14.5	15.8	39.0	17.5	0 1/2	0.044	2 NW	10 P	12
13	9.9	29.942	24.4	15.4	7.4	14.7	19.7	16.2	0		1 SW	1 PRs	13
14	9.9	29.678	33.0	38.3	14.3	37.5	38.7	38.0	0 1/4	0.022	1 W	5 PRs Fm →	14
15	9.8	30.108	29.1	16.0	15.1	15.2	38.1	17.2	0		2 N	3 Pz Rs	15
16	10.0	30.264	22.9	7.4	4.1	6.9	21.0	9.5	0		2 NW	0	16
17	10.7	30.178	24.0	19.9	6.5	19.1	20.2	20.6	0		2 SW	8 Pz Fm →	17
18	10.1	29.810	29.0	31.0	18.9	30.2	30.7	30.5	0		2 SW	9 P Fm →	18
19	10.2	29.779	21.9	27.9	26.9	27.5	39.0	28.2	sep. 89		2 N	10 Pz; snowing	19
20	10.6	30.000	24.0	14.8	9.7	14.0	28.4	16.0	sep. 89	0.390	1 N	10 Pz; a few snowflakes	20
21	10.2	30.160	22.8	11.2	0.7	10.3	16.1	14.0	0 1/2	0.044	1 W	0	21
22	9.9	30.093	23.0	20.4	5.0	19.8	21.0	21.2	0		2 SW	3 Rs Fm	22
23	10.1	30.079	29.7	32.3	19.6	31.7	32.0	32.0	0		1 S	5 PRs	23
24	10.1	30.048	32.3	37.8	27.8	37.2	40.4	37.2	0		1 S.	10 P; raining	24
25	10.5	30.210	31.6	20.4	19.2	19.9	37.8	21.3	10	0.883	2 NW	10 P	25
26	9.9	30.460	25.3	14.3	8.7	13.5	23.5	15.6	0		1 NW	0 P	26
27	10.0	30.700	21.5	17.0	12.3	16.2	23.0	18.0	0		2 NW	0 Rs Fm	27
28	9.9	30.597	25.0	17.6	13.2	16.7	21.2	18.3	0		1 NW	9 P Fm	28
29	10.3	30.400	24.6	19.9	13.8	18.9	23.0	20.3	0		1 NW	10 P; a little snow	29
30	10.1	30.190	28.0	25.9	18.8	25.0	27.3	26.0	0 1/4	0.022	1 S	10 P	30
31	10.0	29.650	33.8	38.7	25.0	37.9	38.1	38.0	4 1/2	0.397	2 SW	10 P	31
	10.1	931.213 30.039 +.004 31.043	837.8 27.0	698.7 22.5	416.7 13.4	567.9 18.3	903.9 29.2			~~3.865~~ 5.200	53 1.7	174 5.6	

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January 1884.

Date	Time P.M.	Barometer	Attached Thermometer	No. 4	Wind	Clouds	Zodiacal light	Aurora	Report to Signal Service
1									Obsc.
2	9.3	29.142	36.0	33.8	2 W	2 P 7m	Hazy	None	None
3	8.2	29.668	33.2	21.6	2 SW	0	Moonlight	Moonlight	None
4	8.2	29.996	28.7	10.0	1 SW	5 P	Moonlight and clouds	Moonlight and clouds	None
5	8.8	29.870	22.8	6.3	2 NW	1 R	Moonlight	Moonlight	None
6	8.3	29.990	22.0	10.9	2 W	1 Rs	Moonlight	Moonlight	None
7	6.9	30.535	24.8	13.0	1 S	1 Rs	Moonlight	Moonlight	None
8									Obsc.
9	8.6	29.262	35.3	33.6	2 SW	10 P	Cloudy	Cloudy	Obsc.
10	6.5	29.976	35.3	27.8	2 SW	5 P Rs	Moonlight and clouds	Moonlight and clouds	None
11									Obsc.
12									Obsc.
13									Obsc.
14									Obsc.
15									Obsc.
16	8.9	30.277	26.6	13.6	1 W	0 haze	Hazy	None	None
17	6.6	30.018	31.0	22.4	1 SW	9 P	Cloudy	Cloudy	Obsc.
18	7.8	29.893	35.2	31.70	W	4 P haze	Cloudy	None	None
19									Obsc.
20									None
21	8.5	30.211	25.7	10.9	1 W	0	Visible	None	None
22	8.2	30.001	30.6	28.4	1 S	9 P	Cloudy	Cloudy	Obsc.
23	7.6	30.068	33.6	33.3	2 S	8 P	Cloudy	Cloudy	Obsc.
24									Obsc.
25									Obsc.
26	8.4	30.494	26.2	16.4	1 NW	0	Visible	None	None
27	8.6	30.682	28.2	15.2	0 NW	5 P haze	Cloudy	Cloudy	None
28									Obsc.
29									Obsc.
30									Obsc.
31									Obsc.

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January 1884.

1, 9.9 A.M. Snow fine, with but little on the ground.

1, 10.2 A.M. Yesterday cloudy day and evening with a little snow. The result from the gauge this morning includes the snow of yesterday, as well as this morning's rain.

2, 4.6 P.M. Day mostly rainy; little or no rain now; gauge $10\frac{5}{8}$ ounces; 0.938 inches.

3, 10.5 A.M. Yesterday evening rather clear 9 P.M. and later, with some haze and clouds; no aurora seen.

3, 10.5 P.M. Day and evening clear, rather cold; clouds coming on at 10 P.M.; no aurora seen.

4, 8.2 P.M. Day clear and cold; thin clouds in the evening; no aurora seen; imperfect lunar halo since 6.5 P.M.

5, 10.8 A.M. Last night rather clear at 11 P.M. and 3 to 4 A.M.

6, 12.2 A.M. Yesterday rather cloudy, clouds thin; rather clear after 7 P.M. but generally some thin clouds; lunar halo 9.1 P.M.; clearer late in the evening; no aurora seen. Clouds at 9 P.M. seemed to move from the south. No. 4 now 3.0.

6, 9.9 P.M. Day clear and cold; thin clouds at times after 8 P.M.; lunar halo about 9 P.M.; no aurora seen.

7, 6.7 P.M. Day clear and cold; many bands of thin cloud in the evening; lunar halo; at 6h 35m (Eastern Time) ζ Persei was a little nearer the Moon than was the inner edge of the halo and β Trianguli was involved in the halo, about as far from the inner edge.

7, 11 P.M. Thin clouds continued; no aurora seen.

9, 10.1 A.M. Yesterday clear at first, becoming cloudy towards night; a little snow in the evening, followed by rain.

10, 10.0 A.M. Yesterday cloudy, partly clear for a time about 5 P.M.; evening cloudy.

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January 1884.

11, 10.0 A.M. Yesterday rather clear; evening at first rather clear, with light clouds; lunar halo about 6½ P.M.; clearer at 7½ P.M.; cloudy at 10 P.M., with a little snow or sleet; no aurora seen.

12, 10.0 A.M. Yesterday somewhat clear at first, cloudy later, with a little rain; evening cloudy.

13, 9.9 A.M. Yesterday cloudy with a few snowflakes; evening mostly cloudy; clear before 11½ P.M.; no aurora seen.

14, 9.9 A.M. Yesterday rather clear, early becoming cloudy with a little snow; evening cloudy.

15, 9.8 A.M. Yesterday mostly rather clear; evening rather cloudy; clouds increasing after 6 P.M.

16, 10.0 A.M. Yesterday rather clear at first, cloudy later; evening cloudy.

16, 11.5 P.M. Day and evening clear and cold; no aurora seen; zodiacal light visible about 7.5 P.M.

18, 10.1 A.M. Yesterday mostly rather clear; evening cloudy after 6 P.M.

19, 10.2 A.M. Yesterday mostly rather cloudy; somewhat clear about 6½ P.M.; zodiacal light then visible; clouds increasing after 7 P.M.; snow this morning, now about 1½ inches deep.

20, 10.6 A.M. Yesterday cloudy with light snow; partly clear for a short time about 7½ P.M. Snow this morning by measure in 5 places 3, 4, 2, 3, 3½; mean 3.10 inches; 16 inches in cylinder 1 13/16 inches across weigh 3 ounces: 6.82714 9.19014 / 6.79568 6.47136 / 6.47712 9.59152 hence rainfall to 1 inch of snow 0.1259 inches; total rainfall 0.390 inches. (Gauge 1½ ounces; 0.132 inches; rejected.)

21, 10.2 A.M. Yesterday cloudy with snow; clear late in the evening, at 11 P.M.; no aurora then seen. Little additional snow on the ground this morning; result from gauge accepted.

~~21~~ 22, 10.8 P.M. Day and evening clear and rather cold; no aurora seen; zodiacal light visible early.

23, 10.1 A.M. Yesterday mostly clear; evening cloudy after 6½ P.M.

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January 1884

24, 10.1 A.M. Yesterday rather cloudy; evening mostly cloudy, clouds variable and thin.

25, 10.5 A.M. Yesterday cloudy day and evening, with rain.

26, 9.9 A.M. Yesterday cloudy day and evening, with a few snowflakes.

26, 11¼ P.M. Day and evening clear and rather cold; no aurora seen; Zodiacal light easily visible early in the evening.

27, 10 P.M. Day clear and rather cold; evening clear at first becoming hazy; no aurora seen; Zodiacal light visible early.

29, 10.3 A.M. Yesterday cloudy and cold with a little snow in the evening; apparently less than 0.1 inches.

30, 10.1 A.M. Yesterday cloudy and rather cold with a little snow at times. Fine frostwork on the trees this morning.

31, 10.0 A.M. Yesterday cloudy with a little snow; rain in the evening.

32, 10.2 A.M. Yesterday cloudy day and evening, with a little rain.

Report to Signal Service, sent Feb. 2, 1884.

Aurora — looked for every clear evening; none seen.

Zodiacal light — visible in the evenings of Jan. 16, 18, 21, 26, 27; observations on most evenings hindered by moonlight or clouds.

Lunar halos — visible in the evenings of Jan. 4, 5, 6, 7, 10.

Note, Feb. 2, 1884. The blanks for Signal Service Reports lately furnished do not have the column for daily returns of results of observations of aurora, which the previous blanks had. One of the new blanks was used for the report sent today, but the column for aurora on page 87 of this book has been filled out as usual.

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Observations of Gegenschein.

In same form as those printed in A.N. CII. 263.

See p 105.

I. Observations comparatively certain.

Date	M α	M δ	Obs.	Ren.	E−M α	E−M δ
1882 Sept. 12	~~23h 38m.3~~ 352°.5	−5°.5	SW	cmgr	~~11h 24m.2~~ − 1°.5	~~+3°.8~~ +1°.7
16	~~23h 47m.7~~ 357°.0	−1.9	S	cmr	~~11h 38m.5~~ −2°.4	~~+2.3~~ −0°.4
Oct. 3	~~0h 5m.0~~ 14°.2	+5.0	S	mr	~~12h 39m.8~~ −4°.3	~~−4.3~~ −0°.7
1883 Feb. 25	~~10h 23m.9~~ 156°.0	+14.6	S	cm	~~22h 35m.8~~ + 3°.0	~~−8.8~~ −5°.8
28	~~10h 28m.4~~ 157°.1	+14.0	S	cm	~~22h 47m.1~~ +4°.6	~~−7.7~~ −6°.3
March 3	~~10h 52m.1~~ 163°.0	+10.5	S	cm	~~22h 58m.3~~ +1°.6	~~−6.6~~ −3°.9
4	~~10h 52m.3~~ 163°.1	+8.4	S	fr	~~23h 2m.0~~ +2°.4	~~−6.2~~ −2°.2
5	~~11h 4m.2~~ 166°.0	+7.6	S	fr	~~23h 5m.8~~ +0°.4	~~−5.8~~ −1°.8
30	~~12h 28m.8~~ 187°.2	−3.5	S	m	~~0h 37m.2~~ +2°.1	~~+3.6~~ −0°.1
April 3	~~12h 34m.3~~ 188°.6	−4.1	S	m	~~0h 51m.7~~ +4°.4	~~+5.5~~ −1°.4
10	~~13h 27m.3~~ 201°.8	−9.3	S	cm	~~1h 17m.3~~ −2°.5	~~+8.2~~ +1°.1
29	~~14h 33m.7~~ 218°.1	−14.6	S	cm	~~2h 29m.2~~ − 1°.8	~~+14.7~~ −0°.1
Sept. 6	~~22h 54m.4~~ 342°.6	−4.5	S	cmr	~~11h 1m.7~~ + 2°.8	~~+6.2~~ −1°.7
9	~~23h 4m.6~~ 346°.1	−4.2	S	cmr	~~11h 12m.5~~ +2°.0	~~+5.1~~ −0°.9
25	~~0h 7m.4~~ 1°.8	−1.2	S	mr	~~12h 10m.0~~ +0°.6	~~−1.1~~ +2°.3
26	~~0h 19m.2~~ 4°.8	+1.3	S	mr	~~12h 13m.1~~ −1°.4	~~−1.5~~ +0°.2
Oct. 1	~~0h 40m.7~~ 10°.2	+3.2	S	mr	~~12h 31m.7~~ −2°.2	~~−3.4~~ +0°.2
3	~~0h 44m.7~~ 11°.2	+2.6	S	mr	~~12h 36m.7~~ −1°.5	~~−4.2~~ +1°.6
1884 Feb. 23	~~10h 31m.5~~ 157°.9	+13.6	S	cm	~~22h 27m.3~~ −1°.0	~~−9.7~~ −3°.9
March 1	~~10h 43m.6~~ 160°.9	+10.3	S	cm	~~22h 53m.7~~ +2°.6	~~−7.1~~ −3°.2

II. Observations comparatively doubtful.

Date	M α	M δ	Obs.	Ren.	E−M α	E−M δ
1882 Sept. 15	~~23h 44m.7~~ 355°.4	−3°.4	S	rd	~~11h 35m.0~~ − 1°.7	~~+2°.7~~ +0°.7
Oct. 8	~~1h 7m.5~~ 16°.9	+7.0	S	rd	~~12h 58m.2~~ − 2°.3	~~−6.2~~ −0°.8
10	~~1h 18m.0~~ 19°.5	+7.5	S	rd	~~13h 9m.5~~ − 3°.1	~~−7.0~~ −0°.5
1883 Feb. 8	~~9h 20m~~ 140°.0	+18.0	S	frd	~~21h 30m.3~~ + 2°.6	~~−14.8~~ −3°.2
March 7	~~11h 10m.9~~ 167°.7	+7.0	S	fr	~~23h 13m.9~~ + 0°.6	~~−5.0~~ −2°.0
8	~~11h 10m.9~~ 167°.7	+7.0	S	frd	~~23h 17m.1~~ + 1°.5	~~−4.6~~ −2°.4
9	~~11h 14m.0~~ 168°.5	+5.7	S	rd	~~23h 30m.7~~ + 1°.7	~~−4.2~~ −1°.5
11	~~11h 22m.3~~ 170°.6	+5.6	S	r	~~23h 28m.1~~ + 1°.4	~~−3.5~~ −2°.1
13	~~11h 30m.8~~ 172°.7	+5.4	S	r	~~23h 33m.4~~ + 1°.1	~~−2.7~~ −2°.7
May 6	~~15h 5m.4~~ 226°.3	−19.3	S	d	~~2h 53m.4~~ − 2°.5	~~+16.7~~ + 2°.6
Sept. 3	~~22h 49m.8~~ 342°.5	−5.8	S	rd	~~10h 51m.2~~ + 0°.4	~~+7.3~~ −4°.0
Oct. 4	~~0h 53m.0~~ 13°.2	+4.2	S	rd	~~12h 42m.7~~ − 2°.6	~~−4.6~~ +0°.4
5	~~0h 57m.2~~ 13°.0	+4.3	S	r	~~12h 46m.3~~ − 1°.5	~~−5.0~~ +0°.7
26	~~2h 4m.9~~ 31°.2	+14.1	S	frd	~~14h 4m.0~~ −0°.0	~~−12.6~~ −1°.5
1884 Feb. 20	~~10h 15m.4~~ 153°.8	+15.6	S	d	~~23h 46m.1~~ − 0°.2	~~−10.7~~ −4°.9

Observations of 1882 Nov. 1, 2, 4, 8, 14, not here entered; they show a permanent maximum of light, confirmed by later observations.

During the same period, remarks on allied subjects occur in the record as follows:

I. Descriptions of stellar or of zodiacal bands, supposed to be permanent phenomena; 1882, April 8, 12, 15, May 7, 15, June 6, 9, 13, 16, 20, July 6, Nov. 2, 4; 1883, March 4, 5, 13, 30, April 9, 10, 29, May 6, 27, 29, June 1; Sept. 6, 9, 27, Oct. 4, Nov. 18; 1884, March 19, April 27.

II. Dark region of sky; darkness of Capricornus; 1882, June 6, Sept. 16; 1883, Sept. 6.

III. Effect of moonlight; of bright stars or planets; 1883, Jan. 15, 17, Nov. 25.

IV. Zodiacal light; 1883, Jan. 31, April 25, Oct. 4.

V. General notes on zodiacal light and bands; 1882, Oct. 15, Dec. 12, 29; 1883, Jan. 11, 12, Feb. 5, 9, 25, March 3, 7, 8, 9, 29, Aug. 5, Oct. 6; 1884, Feb. 1, March 16, 19, 22, 31, April 27.

VI. Light of θ Ceti; 1883, Oct. 3, 8, Nov. 2.

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February 1884.

Day	Time A.M.	Barometer	Attached Thermometer	No. 4	Minimum before and after sr.		Maximum before and after sr.		Gauge	Rainfall in inches	Wind	Clouds
1	10.2	29.511	36.7	37.8	35.9	37.6	41.0	38.0	1 1/8	0.099	2 NW	10 Pm Fm
2	9.9	30.050	27.3	21.1	12.8	20.2	38.0	22.6	0		1 S	6 R Fm →
3	9.6	30.269	29.6	29.8	20.2	29.1	29.5	29.6	0		1 NW	7 R Rs
4	10.2	30.315	32.4	25.4	24.1	24.7	35.0	26.0	sen. 94		2 N	10 R
5	10.5	29.816	28.9	28.2	15.5	27.8	31.0	28.5	5 1/2	0.485	1 N	10 P; a little rain
6	10.1	29.793	37.0	42.9	27.1	41.9	45.4	42.0	0 7/8	0.077	1 S	10 Pm
7	9.7	30.019	39.7	39.7	37.3	38.9	49.7	39.0	2 1/4	0.199	0 calm	10 Pm fog; a little rain
8	10.3	30.445	35.4	29.7	28.1	29.0	41.9	30.0	0 1/2	0.044	3 NE	10 P
9	10.0	30.146	31.4	28.3	18.8	27.4	31.1	28.6	0 1/8	0.011	0 calm	10 P fog
10	9.6	30.333	35.7	34.0	27.2	33.3	37.2	34.0	0 3/4	0.066	3 N	7 R Rs R Fm → Fm
11	9.9	30.530	34.0	31.1	26.3	30.3	36.3	31.0	0		1 N	10 P
12	9.9	30.250	34.1	30.1	27.4	29.4	34.9	30.2	2 7/8	0.254	1 N	10 P
13	9.9	29.859	36.0	36.3	29.2	35.4	36.0	36.0	1 1/4	0.110	0 calm	10 P fog
14	9.9	29.605	42.0	50.1	35.4	49.1	53.3	48.0	2	0.177	2 S	10 Pm; a little rain
15	9.9	30.284	33.7	24.9	24.0	24.2	56.8	26.0	0		2 N	10 R
16	10.2	30.700	29.8	24.8	14.9	24.2	27.0	25.8	0		1 NW	4 R Rs
17	10.0	30.320	34.7	35.6	24.2	34.8	35.0	35.0	0		0 calm	10 Pm
18	10.5	29.710	37.8	38.9	34.7	38.1	42.0	38.5	7 3/4	0.684	2 NE	10 P mist
19	10.0	30.230	36.0	31.0	30.1	30.5	39.3	31.2	0 3/4	0.066	1 NE	10 P
20	10.2	29.356	37.8	48.2	29.3	47.0	48.0	46.0	5 1/2	0.485	3 S	10 Pm Fm M
21	—	—	—	—	—	—	—	—	sen. 95	0.066	—	—
22	10.5	30.251	32.2	30.7	17.4	30.2	50.3	31.0	0		1 NW	0 Rs haze
23	10.4	29.488	37.0	37.1	30.1	36.4	36.8	37.0	5 1/2	0.485	0 calm	10 P fog; raining
24	9.9	30.071	21.1	13.8	10.7	13.1	37.3	15.0	10	0.883	3 NW	0 Rs
25	10.1	30.258	28.8	23.3	13.0	22.3	23.0	23.3	0		0 N	10 P
26	10.2	29.778	34.2	34.0	22.3	33.3	33.7	33.8	3 1/8	0.276	2 N	10 P
27	10.6	29.712	34.7	34.8	27.1	33.9	34.3	34.5	sen. 96 7 3/4	0.684	0 SW	9 P; a little snow
28	10.2	29.271	36.0	33.0	30.8	32.2	38.6	33.0	sen. 96		1 E	10 P; snowing
29	9.7	29.156	out of sight 15.0	7.3	3.6	6.5	33.0	9.0	sen. 97	1.237	3 W	5 R
	282.4 10.1	889.526 ~~29.636~~ -.012 ~~29.614~~ 29.983 -.012 29.971	929.0 33.1	881.9 31.5	677.7 24.2	860.8 30.7	1074.6 38.4			6.388	37 1.3	238 8.5

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February, 1884.

Date	Time P.M.	Barometer	Attached Thermometer	No. 4	Wind	Clouds	Zodiacal Light	Aurora	Report of Signal Service.
1	8.5	29.930	31.8	21.7	2NW	0 Rs	Moonlight	Moonlight	None
2	9.3	30.050	32.7	27.4	1SW	9 Pm 7m /	Cloudy	Cloudy	None
3	9.2	30.250	34.8	31.3	OSE	9P	Cloudy	Cloudy	Obsc.
4									Obsc.
5	10.2	29.682	33.3	42.1	1S	1 Rs	Moonlight	Moonlight	None
6									Obsc.
7									Obsc.
8									Obsc.
9	9.9	29.932	34.5	35.6	2SW	1 P 7m	Moonlight	Moonlight	None
10	8.8	30.506	36.7	29.9	1N	1 P 7m	Moonlight	Moonlight	None
11									Obsc.
12									Obsc.
13									Obsc.
14									Obsc.
15	8.2	30.431	33.5	22.1	2NW	0	Visible	None	None
16	9.4	30.564	36.1	28.5	1SE	5 P Rs haze	Cloudy	Cloudy	Obsc.
17									Obsc.
18									Obsc.
19									Obsc.
20	8.0	29.686	36.0	28.2	3NW	0 7m	Visible	None	None
21	9.6	30.050	36.9	29.8	1S	1 P haze	Hazy	Hazy	None
22	8.7	30.070	38.6	32.2	2SE	10P	Cloudy	Cloudy	None
23	11.4	29.584	32.6	20.4	4NW	1 P 7m	None	None	Aurora
24	7.3	30.218	29.7	19.4	1NW	2 haze	Visible; some haze	None; some haze	None
25									Obsc.
26									Obsc.
27									Obsc.
28									Obsc.
29	8.3	29.350	out of Sight; 2nd 15.0	8.1	2W	2 P haze	Hazy	Cloudy	Obsc.

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February 1884

1, 10½ P.M. Day cloudy at first; clear later; evening clear; no aurora seen. The presence of Jupiter and Mars prevents any observation of light in region between the Milky Way and δ Leonis; but the band below δ Leo is somewhat visible and the sky north of δ Leonis relatively dark.

2, 11½ P.M. Day mostly cloudy; evening cloudy and clear by turns, but frequently cloudy till 10 P.M.; clear about that time and later; no aurora seen.

3, 10.2 A.M. Yesterday cloudy, clouds rather thin; faint lunar halo most of the evening; a few stars visible. New snow this morning about 1½ inches deep.

5, 10.5 A.M. Yesterday cloudy day and evening. The gauge furnishes the best means of determining the total rainfall of the past two days, but the true amount is probably a little larger than that given by the gauge.

5, 10.2 P.M. Day cloudy with a little rain; evening partly clear after 8 P.M., but clouds frequent; temperature high towards night; no aurora seen.

7, 9.7 A.M. Yesterday cloudy and warm day and evening.

8, 10.3 A.M. Yesterday cloudy day and evening; a little rain; this morning a little sleet.

9, 10.0 A.M. Yesterday cloudy day and evening, with a little snow.

10, 9.6 A.M. Yesterday cloudy, with rain becoming rather clear after 9½ P.M.; no aurora seen.

10, 11.5 P.M. Day rather cloudy; evening at first rather cloudy, rather clear for a time about 8 P.M.; hazy & thickening later, with lunar halo; no aurora seen.

12, 9.9 A.M. Yesterday cloudy; a little snow falling about 11 P.M.

13, 9.9 A.M. Yesterday cloudy day and evening.

14, 9.9 A.M. Yesterday cloudy and warm day and evening; a little rain.

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February, 1884

15, 9.9 A.M. Yesterday cloudy with a few drops of rain; evening cooler, cloudy; a few stars visible near the zenith late in the evening.

15, 11.5 P.M. Day cloudy at first, clear towards night; evening clear; no aurora seen.

16, 11 P.M. Day rather clear at first, afterwards thin clouds; evening mostly cloudy; bright stars somewhat visible; clouds variable.

18, 10.5 A.M. Yesterday cloudy day and evening, with rain.

19, 10 A.M. Yesterday cloudy day and evening, with a little rain.

20, 10.2 A.M. Yesterday cloudy day and evening.

20, 10.4 P.M. Day cloudy with rain, clearing off with west wind towards night; evening clear, with passing clouds at first; zodiacal light visible early; no aurora seen.

20, 10.6 P.M. Band below Leo somewhat visible, and apparently
— brighter than body of Leo; no Gegenschein perceptible; sky apparently clear, but may be somewhat hazy; clouds seen forming rapidly near Leo, carried away by wind.

21, 2.8 A.M. At 2 A.M., suspicion of Gegenschein with centre
— about 42 Leonis (α 10h 15m.4, δ +15° 35'). Nothing suspected preceding α Leonis or following k Leonis.

21, 12 M. Barom. 30.136; attached therm. 30.0; No. 4, 27.7; minimum 17.6 (not set); maximum 50.3 (not set); gauge $0\frac{3}{4}$ ounces; wind 1 W; clouds 9 Pc.

22, 10.5 A.M. Yesterday somewhat cloudy; evening mostly cloudy till after 9 P.M.; nearly clear at 9.5 P.M. and later; no aurora seen.

23, 10.4 A.M. Yesterday clear at first; evening rather clear but hazy till 7.5 P.M., becoming cloudy later; no aurora seen.

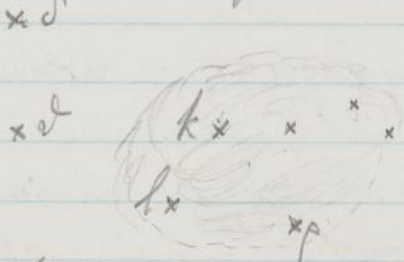
23, 11.5 P.M. Day cloudy with rain becoming cooler, with
— snow and high wind in the afternoon and evening; clearing off 10.5 to 11 P.M.; no aurora seen; at 11.3 P.M. Gegenschein suspected;

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February, 1884.

body of Leo brighter than sky above, and about as bright as band below; appearance somewhat as in sketch; centre estimated two thirds of the way from ℓ Leonis to 46 Leonis.



Place of ℓ Leonis	$10^h\ 42^m.9$	$+11°\ 11'$
" " 46 "	10 25.8	+14 45
" " Gegenschein	10 31.5	+13 34

Light did not appear to extend as far as ζ and η Leonis on the preceding side, nor farther north than η Leonis. Southern limits undistinguishable from band below Leo.

24, 10.9 A.M. Some appearance of auroral light visible last night about midnight.

24, 10.1 P.M. Day mostly clear and cold; evening rather clear, but somewhat hazy; no aurora seen.

26, 10.2 A.M. Yesterday mostly cloudy; some snow after dark.

27, 10.8 A.M. Yesterday cloudy and rather warm, with snow day and evening. Snow today measured in 5 places 8, 9, 8, 8, 8½; mean 8.30 inches; 21 inches in cylinder $1\frac{13}{16}$ inches across weigh 3½ ounces; 9.82 7149.04899 / 8.67778 8.919018 / 0.3440 79.96807 hence rainfall to 1 inch of snow 0.1119 inches; total rainfall 0.929 inches; subtracting 0.276 for amount previously entered, total rainfall 0.653 inches; result by rain gauge, 0.684, accepted, as the snow fell without much wind, and as some of the previous day's precipitation had probably melted.

28, 10.2 A.M. Yesterday mostly cloudy; clouds thin in the evening, stars often generally visible through haze; clouds increasing after 9 P.M.; snowing hard this morning; about 2 inches of new snow.

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February, 1884

28, 7.3 P.M. Baron. 28.999; attached therm. 35.9; No. 4, 32.2. Day cloudy and snowy; clouds broken for a time about 6 P.M.

29, 9.7 A.M. Yesterday evening cloudy with a little snow. Thin clouds this morning.

29, 1.7 P.M. Snow measured in 5 places 10, 12, 11, 11; 10½; mean 10.90 inches; 24½ inches in cylinder 1 13/16 inches across weigh 7¼ ounces; 2.82714 9.29831 / 8.61083 1.05743 / 0.86034 0.33574 hence rainfall to 1 inch of snow 0.1987 inches; total rainfall 2.166 inches; subtracting 0.929 inches obtained from measure of snow Feb. 27, total rainfall from new snow 1.237 inches. Probably about six inches of new snow when freshly fallen; now considerably settled.

29, 4½ P.M. Gauge cleared out.

29, 11½ P.M. Day mostly cold and cloudy; evening hazy, with clouds especially in the north; whitish clouds near northern horizon, probably not auroral.

Report to Signal Service, sent March 3, 1884.

Aurora looked for every clear evening; none seen with certainty. Some appearance of auroral light in the evening of Feb. 23, about midnight. On Feb. 29, among clouds in the north, there were some whitish bands, apparently of cloud, but possibly auroral.

Zodiacal light seen Feb. 15, 20, 24; evenings generally cloudy.

Lunar halos Feb. 4, 10.

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March, 1884

Date	Time P.M.	Barometer	Attached thermometer	Wet	Minimum Dry	Grass	Maximum Dry	Grass	Range	Rainfall in inches	Wind	Clouds
1	10.1	29.624	20.3	10.3	3.3	9.9	12.2	12.4	0		2 W	0
2	10.0	29.680	22.8	12.4	4.4	11.7	18.0	14.0	0		1 NW	8 Rs
3	10.6	29.482	21.6	17.7	4.0	16.6	21.2	18.2	0		0 W	8 Rs
4	10.1	29.900	19.1	15.4	6.3	15.0	24.0	17.0	0		1 W	0 7m
5	10.0	30.300	20.2	15.8	2.8	15.0	19.9	16.6	0		1 S	1 Rs Rs
6	10.2	29.966	29.7	32.8	15.0	32.0	32.0	32.1	2 1/4	0.199	1 W	10 P
7	10.2	30.224	32.0	30.8	25.3	30.2	38.6	31.0	0		2 NE	10 P
8	10.4	29.990	32.0	32.5	24.6	31.8	33.0	32.5	11 1/4	0.993	2 N	10 P, raining
9	10.5	30.148	28.7	24.3	17.8	23.9	32.9	24.7	3 7/8	0.342	2 NE	10 Ps
10	10.5	29.891	32.8	31.9	23.4	31.2	33.0	31.8	5 1/4	0.463	2 NW	2 P 7m \
11	10.1	30.328	31.0	33.1	17.8	32.2	34.3	32.6	0		1 S	10 P
12	10.2	29.875	37.8	48.6	32.2	47.3	47.5	46.5	0 1/2	0.044	1 S	10 Pm
13	10.6	30.290	39.5	41.0	32.0	40.1	(wet)	41.0	0		1 SW	5 Ps Rs
14	9.9	30.114	40.2	43.6	36.2	42.1	45.0	42.6	0		0 calm	10 P
15	10.3	29.770	37.2	33.3	31.8	33.0	46.2	33.3	2 3/4	0.243	2 N	10 P, snowing
16	9.8	30.065	35.7	31.9	24.7	31.5	38.3	32.3	0 1/8	0.011	2 NW	5 Rs Rs
17	9.9	30.244	35.3	37.7	23.2	36.8	37.0	37.0	0		2 S	10 P
18	10.1	30.208	37.3	34.1	32.1	33.8	43.2	34.7	0		2 NW	0
19	10.5	30.284	36.5	36.0	25.0	37.0	38.8	37.4	0		0 S	10 P haze
20	10.2	29.624	38.0	34.5	32.3	34.0	39.2	34.5	9 3/8	0.827	3 NE	10 Pm, raining
21	10.2	30.241	38.0	40.1	32.4	39.4	39.2	39.2	7 1/2	0.662	1 NE	6 P Rs
22	10.0	30.159	37.8	42.4	28.0	42.0	43.0	42.2	0		1 SW	0 haze
23	—	—	—	—	—	—	—	—	—	—	—	—
24	[illegible]	29.690	46.6	53.9	31.9	53.1	54.2	53.3	2 7/8	0.254	1 NW	9 P
25	10.0	29.932	46.0	48.0	36.3	47.1	56.2	48.0	0		2 NW	0 7m
26	10.0	29.842	45.6	45.0	37.1	44.2	54.2	45.0	0 1/8	0.011	2 SE	10 Pm
27	9.9	29.431	45.2	47.0	37.3	46.1	49.0	46.0	8 1/4	0.728	2 NW	10 Pm 7m
28	10.1	29.568	44.6	46.0	37.1	47.2	48.2	47.8	0 1/2	0.044	2 NW	9 Pm M 7m \
29	9.9	29.482	44.0	44.0	35.4	43.1	49.9	43.4	0		1 N	10 Pm M 7m
30	10.0	29.610	28.0	14.0	12.0	13.3	46.6	15.5	33 1/2		3 N	10 Rs, snowing
31	10.9	29.736	30.8	28.3	13.3	27.2	28.3	28.5	0 3/4	0.066	3 N	4 Rs
	10.2	897.698 29.923	1034.3 34.5	1010.4 33.7	715.0 23.8	978.8 32.6	1106.1 36.8		53 3/8	4.887	46 1.5	207 6.9

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1893phar.proj.16600

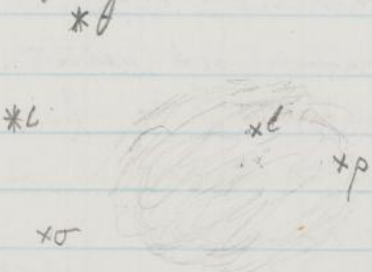
Date	Time P.M.	Barometer	attached Thermometer	No. 4	Wind	Clouds	Zodiacal Light	Aurora	Report of Signal Service
1	7.6	29.700	25.0	12.2	1 SW	7 Pc Rs	Cloudy	Cloudy	Aurora
2	8.7	29.660	20.8	13.8	1 SW	0	Moonlight	Moonlight	Aurora
3	8.7	29.555	25.3	15.5	2 NW	0	Moonlight	Moonlight	None
4	11.1	30.212	22.5	8.2	1 SW	0	Moonlight	Moonlight	None
5									Obsc.
6									Obsc.
7									Obsc.
8									Obsc.
9									Obsc.
10	9.6	30.258	35.2	28.0	1 NW	5 Pc Rs	Moonlight and clouds	Moonlight and clouds	None
11									Obsc.
12	9.6	29.950	43.1	41.5	1 W	2 Rs	Moonlight and clouds	Moonlight	None
13									Obsc.
14									Obsc.
15	9.1	29.929	40.2	33.3	2 NW	2 haze Rs	Hazy	Hazy	None
16	11.4	30.321	37.6	28.0	0 SW	0	Moonlight	Moonlight	None
17									None
18	7.9	30.310	42.0	31.0	1 NW	0	Distinct	None	None
19									Obsc.
20									Obsc.
21	8.0	30.265	42.6	35.7	0 calm	5 PRS haze	Hazy	Hazy	None
22	9.2	30.210	48.2	42.7	0 S	0	Visible	None	Aurora
23									Obsc.
24	9.6	29.732	49.9	44.6	1 NW	4 PRS haze	Haze and clouds	Haze and clouds	None
25	9.4	29.960	52.1	44.0	0 calm	1 Rs haze	Visible	None	None
26									Obsc.
27									Obsc.
28	9.8	29.585	47.7	42.1	2 NW	7 Pm 7m	Cloudy	Extension	Aurora
29									None
30									Obsc.
31	11.5	29.760	36.0	29.2	2 N	0	Moonlight	None	None

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1883phae.proj.11668C

March 1884

1, 12.4 P.M. Day mostly clear, thin clouds early in the evening; clear before 10.5 P.M., and later, with a pronounced arch sky dark below; some appearance of Gegenschein, as in sketch below; there seemed to be some change since Feb. 23; centre estimated one third of the way from ρ to ι Leonis:



Place of ρ Leonis $10^h 26.^m5$ $+9° 55'$
" " ι " 11 17.7 +11 11
" " Gegenschein 10 43.6 +10 20

2, 10.8 P.M. Day rather clear with thin clouds till towards night; evening clear; no aurora seen; clouds now coming.

2, 10.9 P.M. Faint auroral streamers now pretty certainly visible.

3, 10.9 P.M. Day somewhat cloudy; a little snow towards night; mostly clear after 8.5 P.M.; no aurora seen.

4, 11.1 P.M. Day rather clear, with passing clouds; evening clear; no aurora seen.

6, 10.2 A.M. Yesterday rather clear at first, becoming cloudy; a little snow in the evening.

7, 10.2 A.M. Yesterday rather cloudy; evening cloudy.

8, 10.4 A.M. Yesterday cloudy day and evening with a little snow; turning to rain during the night.

9, 10.5 A.M. Yesterday cloudy with rain and afterwards snow, continuing through the evening.

10, 10.5 A.M. Yesterday cloudy day and evening, with snow and rain. There is no way of obtaining the rainfall except by the gauge, which probably gives a rather small result.

11, 10.1 A.M. Yesterday clear; thin clouds after 7.5 P.M.; clear late in the evening; no aurora seen.

12, 10.2 A.M. Yesterday cloudy and thawing with a little rain late in the evening.

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12, 10.5 P.M. Day cloudy and warm, rather clear after 8 P.M., but with thin passing clouds; slight appearance of lunar halo about 9.5 P.M.; no aurora seen.

14, 9.9 A.M. Yesterday mostly cloudy and thawing; evening cloudy.

15, 10.3 A.M. Yesterday cloudy with rain late in the evening.

15, 10.5 A.M. Bulb of No. 4 put into snow and water.

15, 12.5 P.M. No. 4 33.7; snow still left in water, but only near top of water; dry bulb of psychrometer 35.5. More snow added to water.

15, 12.8 P.M. No. 4, 32.3; dry bulb of psychrometer 36.0. [See p. 81, Dec. 26. There may be a suspicion that the ice used on that occasion was not sufficient in quantity to occupy the lower part of the tumbler, around the bulb; still the temperature of the air was then very near the freezing point.]

15, 12.9 P.M. No. 4, 32.9; snow still as low in the tumbler as the bulb of the thermometer. This shows that it is necessary that in experiments of this kind the snow should be thoroughly mixed with the water throughout ~~and~~ at the time when the reading is taken, unless the water can be kept constantly stirred. It cannot be supposed that the reading 32.3 at 12.8 P.M. is below the freezing point of the thermometer, for as the outside temperature was above the freezing point when the snow was collected, and as the snow was actually melting when collected, it cannot have had a lower temperature than the freezing point. Temperature now 38 by psychrometer. More snow added to the water.

15, 5.2 P.M. No. 4, 32.3 + Snow and water removed after this reading.

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March, 1884

15, 10½ P.M. Day cloudy with a little snow, clearing off towards night; evening rather clear with some clouds and haze; no aurora seen.

16, 11.4 P.M. Day mostly clear and cool; evening clear; no aurora seen; zodiacal light visible about 7.5 P.M.; at 10.5 P.M. sky generally light to ~~with~~ a considerable altitude; moon perhaps beginning to interfere; band below Leo somewhat visible; body of Leo rather light as high as γ Leonis, darker above; farther east, too much diffused light for observation of zodiac.

18, 10.1 A.M. Yesterday cloudy; a few drops of rain early in the evening; rather clear, but hazy at 10.5 P.M. and later; no aurora seen.

19, 1.7 P.M. Yesterday clear day and evening; no aurora seen; zodiacal light distinct early in the evening, although Venus hinders observation. At 11¾ P.M. haze coming on from southwest, but sky apparently clear above; band below Leo distinctly visible to Coma Berenices as usual; body of Leo not so light as March 16, but possibly darker above γ Leonis than below; band below β and γ Virginis distinctly visible, as in former years; no Gegenschein detected; sky generally light as high as α Virginis.

20, 10.2 A.M. Yesterday cloudy with snow towards night, and rain later.

21, 10.2 A.M. Yesterday cloudy, with rain and snow; evening cloudy.

22, 10.0 A.M. Yesterday cloudy; evening hazy with some clouds, gradually becoming clearer; no aurora seen; Gegenschein looked for at 11 P.M., but none seen; band below Leo and to Coma Berenices as usual; band below β and γ Virginis somewhat visible.

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22, 10.8 P.M. Day and evening clear and cool; now becoming somewhat hazy; faint aurora since 10 P.M. over mist or dark sky; slight appearance of streamers; bands seen as March 16 and 18, but no Gegenschein; the whole southeastern sky is light as high as α Virginis; the increasing use of electric light in Boston probably prevents observation in that direction.

23, 11.2 A.M. Baron. 30.180; attached therm., 43.9; No. 4, 49.8; minimum, 31.9 (not set); maximum 51.3 (not set); wind 1 S E; clouds 10 Cm 7m; gauge 0.

24, 10.2 A.M. Yesterday cloudy and rather warm, with rain in the evening.

25, 10.0 A.M. Yesterday mostly cloudy; evening partly clear, but hazy with occasional clouds: no aurora seen.

26, 10.0 A.M. Yesterday mostly clear and warm; evening hazy, haze increasing; Zodiacal light easily visible early in the evening; no aurora seen.

27, 9.9 A.M. Yesterday cloudy with rain, rather heavy towards night; funnel of gauge found partly out of place this morning, and owing to its mouth not being level, the measured rainfall may be too small.

28, 10.1 A.M. Yesterday cloudy, with rain towards night and in the evening; clearing off later.

28, 9.8 P.M. Day and evening cloudy ~~now~~ clearing, with extensive aurora among clouds; bright auroral cloud near zenith about 9.7 P.M.; soon fading.

29, 9.9 A.M. Almost wholly cloudy near midnight last night.

30, 10.0 A.M. Yesterday cloudy; evening partly clear at times; no aurora seen; cloudy about midnight with a little rain, followed by snow; wind high early today with snow rather thick; the snow now on the ground may be 2 to 3 inches, but lies entirely in drifts and cannot be measured.

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March 1882.

31, 10.9 A.M. Yesterday cloudy with a little snow; evening cloudy with snow; clouds thin, stars sometimes visible.

Record by gauge probably too small, but accepted in default of a better determination of rainfall since March 29.

31, 11.5 P.M. Day and evening. Clear and rather cold; no aurora seen.

31, 11.7 P.M. Body of Leo dark; band below and to Coma as usual; band below β & γ Virginis somewhat visible; sky generally light — to near α Virginis; no Gegenschein perceptible.

Report to Signal Service (sent towards the middle of April).

Aurora looked for every clear evening; results as follows:

March 1. Early evening cloudy; after 10h 30m P.M. auroral arch visible; sky dark below.

March 2. Faint auroral streamers pretty certainly visible at about 11 P.M.

March 22. Faint aurora after 10 P.M. over mist or dark sky; slight appearance of streamers.

March 28. Extension aurora among clouds visible about 9h 45m P.M.; bright auroral cloud near zenith, soon fading; cloudy early and late in the evening.

Zodiacal light visible March 16, 18, 22, 25; observations generally hindered by haze, clouds, or moonlight.

Lunar halo, faint, on March 12, about 9h 30m P.M.

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March 1884

Observation of Gegenschein by E. E. Barnard on the night of March 29, at 11 P.M. R.A. of centre about that of γ Virginis; decl. a little south of γ Virginis; diameter fully 15°. In his postal card of March 30, 1884.

Combination of observations of Gegenschein from p. 91, with half weight to those more doubtful.

α 140° to 144.9	1 obs., doubtful;	α 140.0	δ +18.0	α 340° to 344.9	2 obs., 1 doubtful; mean by wts.	α 342.5	δ −4.9
			β +2				β +2
α 150 " 154.9	1 " "	153.8	+15.6	345 " 349.9	1 ", good	346.1	−4.2
			+5				+2
α 155 to 159.9	3 " good; mean	157.0	+13.1	350 " 354.9	1 ", "	352.5	−5.5
			+3				−2
α 160 " 164.9	3 " " ; "	162.3	+9.7	355 " 359.9	2 ", 1 " ; mean by wts.	356.5	−2.4
			+2				0
α 165 " 169.9	4 ", 1 " ; mean by wts.	167.2	+7.0	0 " 4.9	2 ", good; mean	3.3	0.0
			+1				−1
α 170 " 174.9	2 ", doubtful; mean	171.6	+5.5	10 " 14.9	5 ", 3 good; mean by wts.	12.2	+3.8
			+1				−2
α 185 " 189.9	2 ", good; "	187.9	−3.8	15 " 19.9	2 ", doubtful; mean	18.2	+7.2
			0				−1
α 200 " 204.9	1 " "	201.8	−9.3	30 " 34.9	1 ", "	31.2	+14.1
			+1				+2
α 215 " 219.9	1 " "	218.4	−14.6				
			0				
α 225 " 229.9	1 " doubtful	226.3	−19.3				

Similar combination from A.N. CII. 263; those marked d, p, d, p having half weight if combined with others.

α 150° to 154.9	6 obs., 3 good; mean by wts.	α 152.2	δ +14.4	α 340° to 344.9	1 obs., doubtful;	α 341.5	δ −8.0
			β +3				β 0
155 " 159.9	2 ", good; mean	156.0	+16.5	10 " 14.9	1 ", " ;	10.0	+1.0
			+6				−3
160 " 164.9	1 ", "	160.0	+13.0				
			+4				
170 " 174.9	3 ", doubtful; mean	171.3	+3.3				
			0				
175 " 179.9	1 ", "	176.0	+2.5				
			0				
180 " 184.5	2 ", good; mean	181.5	−1.0				
			0				
185 " 189.9	3 ", " ; "	187.7	0.0				
			+3				
190 " 194.5	2 ", 1 " ; mean by wts.	192.7	−3.3				
			+2				
195 " 199.5	1 ", good;	197.5	−7.5				
			0				
205 " 209.9	2 ", 1 " ; mean by wts.	205.7	−10.8				
			0				
210 " 214.9	3 ", 2 " ; — " —	211.5	−9.1				
			+3				
215 " 219.9	2 ", doubtful; mean	217.5	−14.2				
			0				
220 " 224.9	4 ", 3 good; mean by wts.	220.7	−14.8				
			0				

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April 1884

Date	Time A.M.	Barometer	Attached thermometer	No. 4	Minimum in open and after setting	Maximum before and after setting		Gauge	Rainfall in inches	Wind	Clouds
1	10.1	29.702	35.4	35.4	26.1	35.0	36.0	35.8	0		2 N	0
2	10.2	29.454	37.3	35.0	30.2	34.3	44.0	35.0	0		0 calm	10 P
3	11.1	28.861	37.2	37.0	29.6	36.1	36.5	36.0	6 in. Sent to Prof. Pickering	1.594	3 NW	10 P, raining
4	9.7	29.070	38.2	35.9	34.7	35.2	38.8	36.0	$2\frac{3}{8}$	0.210	2 NW	10 P, snowing
5	10.2	29.255	39.0	38.7	35.1	38.2	39.2	38.6	$0\frac{1}{2}$	0.044	2 NW	10 P
6	10.4	29.530	37.8	41.7	32.1	41.0	41.3	41.2	0		1 W	10 P
7	10.1	29.624	40.0	40.5	34.6	39.8	49.0	40.2	0		2 NW	10 P, a little rain
8	10.0	29.834	42.0	43.9	38.2	43.1	47.3	43.5	$0\frac{1}{8}$	0.011	1 NE	10 P
9	9.9	29.780	41.1	37.4	34.5	36.9	47.0	37.3	$0\frac{1}{4}$	0.122	2 E	10 Pm
10	10.0	29.348	38.8	38.0	32.8	37.5	38.3	38.0	$6\frac{1}{4}$	0.552	2 N	10 Pm
11	10.2	29.742	41.0	45.8	36.1	45.0	45.3	45.3	$1\frac{1}{4}$	0.110	1 NE	10 Pm M 7m
12	10.1	29.992	41.7	47.0	34.6	46.3	48.2	47.0	0		1 NW	2 M 7m \ Rs
13	9.7	29.998	45.0	47.4	35.4	46.5	57.7	47.2	0		2 N	0
14	9.7	30.120	44.4	46.7	31.5	46.0	53.0	46.3	0		1 W	1 Rs
15	10.2	30.031	47.7	53.6	36.7	52.4	57.6	52.8	0		2 E	10 P 7m
16	10.1	29.599	50.0	56.1	41.0	55.0	55.2	55.0	$9\frac{5}{8}$	0.849	1 SW	10 Pm
17	9.8	29.797	52.0	54.8	46.6	54.0	68.0	54.3	$0\frac{3}{4}$	0.066	1 NE	10 Pm
18	9.9	29.850	48.5	41.8	41.1	41.1	59.7	42.2	$0\frac{7}{8}$	0.077	3 N	10 P, fine rain
19	9.6	29.894	45.8	43.0	40.7	42.3	44.3	43.2	$1\frac{1}{8}$	0.099	2 NE	10 Pm
20	9.4	29.890	46.6	49.0	42.0	48.2	48.7	48.7	0		2 NE	10 Pm
21	9.5	29.929	49.0	51.5	46.3	50.9	51.1	51.0	1	0.088	3 N	10 Pm
22	9.6	30.031	41.8	40.0	31.1	39.4	52.0	40.0	0		3 NW	0
23	9.7	29.953	45.2	47.1	31.4	46.4	51.7	47.0	0		2 SW	0
24	10.3	29.558	50.2	51.8	38.3	51.0	60.1	51.5	0		2 E	2 Rs 7m
25	10.1	29.725	48.4	48.0	41.4	47.2	53.9	47.8	$1\frac{1}{4}$	0.110	3 N	10 Pm 7m
26	10.1	29.663	48.0	47.9	42.2	47.1	50.3	47.5	6	0.530	2 NE	10 Pm 7m //
27	9.3	30.101	48.0	50.1	39.9	49.4	54.8	50.0	0		2 NE	2 Rs 7m /
28	9.9	30.078	47.1	48.5	33.9	47.4	52.5	48.1	0		0 calm	5 P 7m \ haze
29	10.2	29.888	47.3	49.9	37.1	49.1	49.9	49.4	0		2 NW	10 Pm 7m \
30	10.2	29.961	48.1	53.8	39.8	53.0	55.3	55.1	0		2 N	1 7m
	10.0	892.293 / 29.742 / -.042 / 29.700	1322.6 / 44.1	1359.5 / 45.3	1095.0 / 36.5	1336.8 / 44.6	1480.7 / 49.4		$57\frac{5}{8}$	0.530 / 4.392 / 4.362	54.8	217 / 7.1

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April, 1884

Date	Time Obs.	Barometer	Attached thermometer	No. 4	Wind	Clouds	Zodiacal Light	Aurora	Report to Signal Service.
1	11.4	29.670	41.0	33.7	0 calm	0	Moonlight	Moonlight	None
2									Obs.
3									Obs.
4									Obs.
5									Obs.
6	10.1	29.582	43.7	37.4	1 NW	3 Rs	Moonlight	Moonlight	None
7									Obs.
8									Obs.
9									Obs.
10									Obs.
11	9.5	29.906	45.1	40.6	0 calm	4 Pm Fm →	Cloudy	Moonlight	None
12	8.1	29.996	52.3	44.5	0 W	1 Rstm haze	Visible	None	None
13	8.1	30.084	47.1	39.9	0 SW	0 haze	Visible	None	None
14	8.2	30.050	50.5	45.3	1 E	0 haze	Visible	None	None
15									Obs.
16									Obs.
17									Obs.
18									Obs.
19									Obs.
20									Obs.
21									Obs.
22	10.5	30.052	47.7	37.5	0 calm	1 Phaze	Hazy	None	None
23	8.2	29.919	53.6	47.9	1 S	0 haze	Visible	None	None
24									Obs.
25									Obs.
26	8.3	29.838	52.2	48.6	0 calm	1 Phaze	Visible	Suspected	Aurora
27	8.6	30.152	52.3	41.2	0 calm	0 Rs	Visible	None	None
28	8.3	30.001	50.7	43.5	2 E	1 Pm Fm →	Moonlight	Moonlight	None
29									Obs.
30	8.4	30.008	56.1	53.6	0 calm	0	Moonlight	Moonlight	None

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April 1884

1, 11.4 P.M. Day clear and cool; evening rather clear, with thin passing clouds; no aurora seen.

3, 10.7 ~~A.M.~~ Yesterday cloudy with snow ~~towards night~~ in the afternoon and evening; rain today. Snow measured in 5 places; 6, 7½, 8, 8, 7½; mean 7.40 inches; 23 inches in cylinder 1 13/16 inches across weigh 7⅜ ounces; 9.5214 9.3331 7 8.6362 8.8697 3 0.8577 6 0.2540 Hence rainfall to 1 inch of snow 0.2154; total rainfall 1.594 inches. Result by gauge (0.552 inches) rejected

4, 9.7 A.M. Yesterday cloudy with a little rain day and evening.

5, 10.2 A.M. Yesterday cloudy with a little snow and rain; evening cloudy.

6, 10.4 A.M. Yesterday cloudy day and evening.

6, 10.1 P.M. Day cloudy at first, clearing off after noon; evening rather clear, with some thin clouds; no aurora seen.

8, 10.0 A.M. Yesterday cloudy day and evening, with a few drops of rain.

9, 10.0 A.M. Yesterday cloudy day and evening, with a few drops of rain.

10, 10.9 A.M. Yesterday cloudy day and evening, with some rain and a little snow.

11, 10.2 A.M. Yesterday cloudy day and evening; a little rain.

12, 10.1 A.M. Yesterday cloudy with a little rain; evening partly clear; no aurora seen.

12, 10.6 P.M. Day rather warm with passing clouds; evening mostly clear; no aurora seen.

13, 10.6 P.M. Day and evening rather warm and clear; no aurora seen.

14, 11.0 P.M. Day and evening rather warm and clear; no aurora seen.

16, 10.1 A.M. Yesterday cloudy day and evening, with rain.

17, 9.8 A.M. Yesterday mostly cloudy day and evening, with a little rain.

18, 9.9 A.M. Yesterday cloudy day and evening.

19, 9.6 A.M. Yesterday cloudy and cool day and evening, with a little rain.

20, 9.4 A.M. Yesterday cloudy day and evening.

21, 9.5 A.M. Yesterday cloudy day and evening, with a little rain.

22, 9.6 A.M. Yesterday cloudy day and evening.

22, 11.0 P.M. Day clear and cool; evening clear with clouds near the horizon, especially in the south, and some haze; no aurora seen; Zodiacal Light visible early in the evening.

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23, 11.3 P.M. Day and evening clear, somewhat hazy; no aurora seen

25, 10.1 A.M. Yesterday rather clear, soon cloudy; a little rain towards night; evening cloudy.

26, 10.1 A.M. Yesterday cloudy day and evening; with a little rain.

26, 11.2 P.M. Day cloudy with rain, becoming clear towards night; zodiacal light visible early in the evening; aurora suspected at 8.3 P.M.; at 9 P.M. distinct arch over dark sky; less visible later.

27, 10.7 P.M. Day and evening clear, rather chilly; no aurora seen; zodiacal light visible early in the evening; also much general appearance of zodiacal band, but on close examination this seemed compound of the various well known bands. Southeastern sky too light to permit observation of zodiac in that direction.

29, 10.2 A.M. Yesterday mostly clear; evening somewhat cloudy; no aurora seen.

30, 10.2 A.M. Yesterday mostly cloudy; evening cloudy.

30, 11.2 P.M. Day and evening clear and rather warm; no aurora seen.

Report to Signal Service, sent about May 4.

Aurora looked for every clear evening; results as follows:
April 26. Aurora suspected at about $8^h 20^m$ P.M.; at 9^h P.M. distinct arch over dark sky; less visible later.

Zodiacal light visible on the evenings of April 12, 13, 14, 22, 23, 26, 27; observations on the evenings hindered by moonlight or clouds.

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May 1884

Date	Time A.M.	Barometer	Attached thermometer	No. 4	Minimum before and after setting	Maximum before and after setting		Gauge	Rain fall in inches	Wind	Clouds	Date
1	9.9	30.080	52.8	51.0	43.1	50.1	65.7	51.0	0	~~2.5~~	62 E	0	1
2	10.3	29.836	52.1	55.4	42.0	54.3	53.4	55.0	0		1 SW	10 Pm	2
3	10.0	30.131	53.9	54.8	44.1	54.1	72.2	54.5	0		2 NW	0	3
4	9.7	30.140	54.0	61.7	44.1	60.9	61.8	60.7	0		1 W	4 P Rs	4
5	10.1	30.020	56.1	53.4	50.7	54.6	69.0	55.1	0 1/4	0.022	0 calm	10 Pm	5
6	10.3	30.048	54.8	51.4	45.1	50.2	57.9	51.2	0 1/4	0.022	2 NE	9 P 7m	6
7	10.1	30.148	51.1	47.7	42.7	47.0	52.0	47.8	0 3/8	0.033	3 NE	10 P	7
8	10.2	30.061	48.1	42.8	40.8	42.1	48.6	43.0	2 1/8	0.188	2 NE	10 P; fine rain	8
9	10.3	29.829	48.8	55.0	39.8	53.5	57.8	51.3	4 3/8	0.386	1 SW	10 Pm	9
10	9.9	29.494	54.0	60.8	49.5	59.7	63.8	59.4	0		2 W	8 Pm M 7m →	10
11	9.6	29.534	53.4	57.4	45.1	56.4	63.0	56.9	2 1/8	0.188	2 W	8 P M 7m	11
12	9.8	29.674	52.7	55.1	44.0	54.3	63.1	55.0	0		2 NW	8 M 7m →	12
13	9.9	29.976	52.7	55.2	42.2	54.1	60.7	54.9	0		2 NE	9 Pm M 7m →	13
14	10.2	29.659	54.7	47.8	43.5	47.1	55.6	47.7	6 1/4	0.552	2 NE	10 Pm	14
15	9.9	29.847	52.0	59.0	41.0	58.2	58.3	58.3	0		2 W	0 7m	15
16	10.0	29.636	55.2	57.8	50.2	57.0	67.5	57.2	0 1/2	0.044	1 SW	10 Pm; a little rain	16
17	10.5	29.605	53.2	59.1	38.4	58.2	65.3	58.1	0		2 W	8 M 7m →	17
18	9.7	29.802	53.0	59.4	44.9	58.8	60.0	59.0	0 3/8	0.033	2 NW	8 M 7m →	18
19	10.1	29.922	56.7	69.2	46.7	67.9	68.0	67.0	0		1 SW	3 haze	19
20	9.9	29.992	59.4	66.0	51.6	65.0	78.2	64.3	0		2 S	10 Pm 7m ↑	20
21	9.8	30.027	61.0	67.4	57.0	66.3	68.9	66.7	7 1/4	0.640	2 N	1 M 7m	21
22	9.7	30.190	61.5	71.9	52.6	70.4	73.4	70.0	0		0 calm	2 haze	22
23	9.7	30.153	62.0	61.3	56.0	60.2	74.1	60.8	0 1/8	0.011	0 SE	10 Pm 7m →	23
24	10.3	29.876	63.7	74.1	59.1	72.9	76.1	72.0	0 3/4	0.066	2 SW	0 M 7m	24
25	9.7	29.912	67.8	64.7	60.9	63.9	see p. 114	64.1	0		3 E	10 Pm 7m	25
26	10.2	29.990	61.1	60.4	46.8	59.5	64.4	60.0	0		2 E	8 P 7m haze	26
27	10.1	29.807	60.0	66.1	46.2	65.1	65.0	64.8	0		2 E	5 Pm 7m	27
28	10.4	29.796	51.3	53.3	53.7	54.7	67.0	55.1	1 3/4	0.154	1 N	10 Pm; raining	28
29	10.0	29.840	53.7	51.7	40.3	50.9	55.3	51.8	8 3/8	0.739	2 NW	5 M 7m →	29
30	10.7	29.977	51.0	47.6	35.0	46.5	54.8	47.5	0		0 NW	10 Pm M 7m ↘	30
31	10.1	30.200	51.8	58.0	37.1	56.9	57.0	57.0	0		1 SW	7 M 7m →	31
	10.0	927 29.911 29.871 29.816	1710.6 50.2	1800.5 58.1	1434.2 46.3	1770.8 57.1	1905.5 61.5		34 1/8	2.924 3.078	49 1.6	213 6.9	

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May 1884.

Date	Time P.M.	Barometer	Attached Thermometer	No. 4.	Wind	Clouds	Zodiacal light	Aurora	Abstract.
1	10.3	30.049	54.2	44.7	1 S	9 P Fm	Cloudy	Cloudy	None
2	9.4	29.855	61.8	58.3	2 W	2 P haze	Moonlight and clouds	Moonlight and clouds	None
3	8.7	30.136	58.7	54.8	2 W	9 P Fm	Cloudy	Cloudy	None
4	8.7	30.076	60.6	59.3	2 SW	7 Pm Fm ↘	Cloudy	Cloudy	Obsc.
5	8.4	29.953	57.9	53.3	0 NW	3 P Fm	Moonlight and clouds	Moonlight and clouds	None
6									Obsc.
7									Obsc.
8									Obsc.
9	9.2	29.717	56.0	52.4	2 S	3 P Rs haze	Moonlight and clouds	Moonlight and clouds	None
10	8.8	29.516	57.0	52.3	2 SW	2 Pm Fm	Moonlight	Moonlight and clouds	None
11	9.1	29.569	57.8	50.7	1 W	3 P Fm haze	Moonlight	Moonlight and clouds	None
12	8.5	29.830	56.4	51.8	2 N	0 Fm	Suspected; twilight	None	None
13									Obsc.
14	9.0	29.831	54.8	44.7	0 calm	0 haze	None	None	None
15									None
16	8.6	29.708	58.3	51.0	1 W	0	Twilight	None	None
17	8.7	29.716	55.1	47.3	2 W	5 Pm Fm ↘	Cloudy	None; some clouds	None
18	8.7	29.878	60.7	57.8	1 W	2 haze	Hazy	Hazy	None
19	8.5	29.983	64.0	62.4	2 SW	4 P haze	Twilight and haze	Hazy	None
20									Obsc.
21	8.5	30.111	65.9	58.8	0 calm	2 P haze	Hazy	Hazy	Obsc.
22	8.7	30.208	66.9		0 calm	5 P haze	Hazy	Cloudy	Obsc.
23	8.5	30.033	66.3	64.1	2 S	6 P haze	Cloudy	Cloudy	Obsc.
24	8.5	29.806	72.6	75.1	0 calm	1 Rs haze	Twilight	Twilight	None
25	8.7	29.987	67.6	54.1	0 NE	0 Fm	Twilight	Twilight	None
26	8.7	29.904	63.2	53.8	1 E	0 Rs Fm	Twilight	Twilight	None
27									Obsc.
28									Obsc.
29	8.8	29.980	55.7	44.0	1 NW	5 Pm Fm ↑	Moonlight and twilight	Moonlight and twilight	None
30	8.5	30.095	55.0	45.5	0 W	1 Fm →	Moonlight and twilight	Moonlight and twilight	None
31	8.8	30.293	59.2	51.5	2 S	0	Moonlight	Moonlight	None

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1883phae.proj.1668C

May 1884.

1, 10.3 P.M. Day mostly clear, somewhat hazy; evening mostly rather cloudy, partly clear at times; no aurora seen; imperfect lunar halo occasionally visible.

2, 6.1 P.M. Sun disappeared behind clouds at 6.0 P.M. For some time previously its color, as seen through thick haze, was a remarkably strong red.

2, 10.9 P.M. Day cloudy early, rather clear later; hazy towards night as above noted; windy with much dust after 6.5 P.M.; evening cloudy at first, clear after 9 P.M.; no aurora seen.

4, 9.7 A.M. Yesterday clear and rather warm; evening partly cloudy; no aurora seen.

4, 8.7 P.M. J.B.G. aneroid 768.7

5, 10.1 A.M. J.B.G. aneroid 767.0. Yesterday rather cloudy day and evening.

5, 8.4 P.M. J.B.G. aneroid 765.2.

5, 11.7 P.M. Day rather cloudy, clearer towards night; evening rather clear, with thin clouds; no aurora seen.

6, 10.3 A.M. J.B.G. aneroid 768.2

7, 10.1 A.M. J.B.G. aneroid 771.8. Yesterday cloudy and cool day and evening, with a little rain.

8, 10.2 A.M. J.B.G. aneroid 769.7. Yesterday cloudy and cool day and evening, with a little rain.

9, 10.3 A.M. J.B.G. aneroid 763.1. Yesterday cloudy and cool day and evening with some rain; thunder and lightning after midnight. No minimum and especially maximum thermometer, somewhat out, which explains low readings.

9, 9.2 P.M. J.B.G. aneroid 759.1

9, 10.2 P.M. Day warm and cloudy; evening partly clear; no aurora seen; clouds now increasing.

10, 9.9 A.M. J.B.G. aneroid 753.0

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1883phae.proj.16698

May 1883.

Barometer Newman 68

Time.	Barom.	Att. th.	Red.	Barom. red. to freezing point in.		J.B.G. aneroid	Corr. to aneroid.
4, 8.7 P.M.	30.076	60.6	−.086	29.990	761.7	768.7	−7.0
5, 10.1 A.M.	30.020	56.1	−.074	29.946	760.6	767.0	−6.4
5, 8.4 P.M.	29.953	57.9	−.079	29.874	758.8	765.2	−6.4
6, 10.3 A.M.	30.048	54.8	−.070	29.978	761.4	768.2	−6.8
7, 10.1 A.M.	30.148	51.1	−.060	30.088	764.2	771.8	−7.6
8, 10.2 A.M.	30.061	48.1	−.052	30.009	762.2	769.7	−7.5
9, 10.3 A.M.	29.829	48.8	−.054	29.775	756.3	763.1	−6.8
9, 9.2 P.M.	29.717	56.0	−.073	29.644	752.9	759.1	−6.2
10, 9.9 A.M.	29.494	54.0	−.067	29.427	747.4	753.0	−5.6
10, 8.8 P.M.	29.516	57.0	−.075	29.441	747.8	753.5	−5.7
11, 9.6 A.M.	29.534	53.4	−.066	29.468	748.5	755.0	−6.5

10, 8.8 P.M. J.B.G. aneroid 753.5

10, 10.2 P.M. Day cloudy with thundershowers; a little hail about noon; afternoon with occasional showers; evening mostly clear; no aurora seen.

11, 9.6 A.M. J.B.G. aneroid 755.0

11, 9.8 P.M. Day rather cloudy with a few drops of rain; evening partly clear; no aurora seen.

12, 11.2 P.M. Day rather clear and warm; evening clear at first, becoming cloudy late in the evening; no aurora seen.

14, 10.2 A.M. Yesterday clear at times; haze and clouds towards night; rain late in the evening.

14, 11 P.M. Day cloudy, becoming clear; evening clear with some haze; no aurora seen; Zodiacal light suspected about 8½ P.M.

16, 10 A.M. Yesterday clear at first becoming cloudy; rain towards night; evening rather clear early; with increasing haze and clouds; no aurora seen.

16, 11.7 P.M. Day cloudy at first, clear towards night; evening clear; no aurora seen.

17, 9.3 P.M. Day clear at first becoming cloudy with a little hail and rain; evening rather clear at first cloudy later; no aurora seen.

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May 1884.

May 18, 10.7 P.M. Day rather cloudy, clearer towards night; evening hazy; no aurora seen.

May 19, 10.3 P.M. Day warm and hazy; haze rather thick in the evening; no aurora seen.

May 21, 9.8 A.M. Yesterday cloudy day and evening, with rain.

21, 10.9 P.M. Day warm and rather clear; evening hazy, with some fog.

23, 9.7 A.M. Yesterday hazy and warm; thick haze in the evening, and increasing clouds.

24, 10.3 A.M. Yesterday rather cloudy; evening hazy with increasing clouds; ~~heat~~ lightning without thunder 8.7 P.M. and later; one peal of thunder about 11.7 P.M. and a short shower about the same time.

24, 11.1 P.M. Day rather hot, mostly clear; some haze and clouds in the evening; no aurora seen; faint distant lightning in the southwest about 10 P.M., without thunder.

25, 9.7 A.M. Maximum reading lost by disturbance of thermometer; but when looked at last night it appeared to have reached 79 during the day.

25, 11.3 P.M. Day warm at first, mostly cloudy and cool with east wind; evening mostly clear; no aurora seen.

26, 11.2 P.M. Day rather cool and clear; evening clear; no aurora seen.

29, 10.0 A.M. May 27 rather clear, evening cloudy; May 28. cloudy day and evening, with rain.

30, 10.7 A.M. Yesterday cool and mostly cloudy; evening partly clear at times; no aurora seen.

30, 11.6 P.M. Day mostly rather cloudy and cool; evening mostly clear; no aurora seen.

31, 10.4 P.M. Day and evening rather clear and cool; no aurora seen.

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Report ~~to~~ Signal Service, sent ~~14~~ June 5, 1884.

Aurora — looked for every clear evening; none seen.

Zodiacal light — suspected about 8½ P.M. on May 12 and 14; observations on other days generally prevented by moonlight, clouds, or haze.

Lunar halo — May 1. Imperfect lunar halo occasionally visible during the evening.

Thunder and lightning. — May 9. Thunder and lightning early today, after midnight.
May 10. Day cloudy, with thundershowers; a little hail about noon.

May 23. Lightning without thunder 8¾ P.M. and later; one peal of thunder about 11¾ P.M. and a short shower about the same time.

May 24. Faint distant lightning ~~at~~ in the southwest about 10 P.M., without thunder.

Remarks. The thunder and lightning on May 23 and May 24 are also recorded on the separate cards furnished recently for that purpose. No observer here is sufficiently at leisure to undertake the minute observations proposed in the circular of May 1, (No. III), but such observations as can be made will be sent.

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June, 1883

Date	Time 7h. M.	Barometer	Attached Thermometer	Wet	Minimum Before and after setting		Maximum Before and after setting		Gauge	Rainfall in inches	Wind	Clouds.	Date
1	9.8	30.375	54.7	57.3	43.2	58.3	64.2	57.0	0		2 E	0 haze	1
2	9.5	30.216	53.6	60.6	41.2	60.0	69.4	60.0	0		3 NE	0	2
3	10.2	29.900	58.2	68.7	47.9	67.3	67.2	67.0	0		0 SW	1 haze	3
4	10.0	29.973	64.6	75.5	61.7	74.5	77.2	74.1	0		1 N	2 haze Fm	4
5	9.9	30.091	66.7	77.1	59.6	75.8	81.9	75.0	0		1 SW	2 haze	5
6	10.0	30.100	68.8	78.4	62.6	76.9	85.3	76.3	0		1 SW	1 haze	6
7	9.3	30.032	69.7	77.5	63.1	76.1	85.0	75.9	0		1 W	9 P haze	7
8	9.9	29.960	70.8	79.0	64.2	77.4	86.3	77.0	0 1/4	0.022	2 SW	0 haze	8
9	9.8	29.826	71.4	76.2	64.3	75.1	85.2	75.0	0		1 SW	0 M Fm	9
10	10.0	29.950	68.0	55.6	55.0	55.0	82.9	56.2	0		2 NE	10 Pm	10
11	9.5	30.134	62.3	55.3	52.7	54.5	56.6	55.7	0		2 E	10 Rm	11
12	9.7	30.032	60.6	59.4	50.4	58.2	58.5	58.5	0		0 E	10 Rm fog; a few drops of rain	12
13	9.7	30.209	63.5	60.4	57.6	59.8	64.3	60.0	4	0.353	2 E	10 Rm M Fm	13
14	10.2	30.546	61.9	58.6	49.8	57.9	65.0	58.7	0		2 E	1 R Fm →	14
15	9.4	30.549	57.2	59.0	40.5	58.3	60.3	58.2	0		2 E	0 haze	15
16	9.9	30.170	59.6	67.8	47.0	66.3	66.4	66.0	0		2 SW	10 Rm Fm	16
17	9.6	30.102	66.8	78.4	61.3	77.1	78.7	76.3	0		0 NW	2 haze	17
18	9.9	30.049	68.9	77.0	58.8	75.7	88.0	75.2	0		1 SW	0 haze	18
19	10.7	29.900	72.0	83.9	61.1	82.5	88.5	82.3	0		1 NW	0	19
20	10.2	29.995	70.9	74.1	62.1	73.0	89.3	72.0	4 3/8	0.386	1 N	6 M Fm	20
21	9.9	29.916	73.4	82.4	65.0	81.3	81.0	80.9	0		1 W	5 P haze	21
22	9.7	30.090	74.1	71.7	66.6	70.4	90.0	71.2	0		2 E	1 haze	22
23	9.9	30.221	67.0	72.0	52.0	71.0	72.6	70.7	0		1 S	1 haze	23
24	9.8	29.970	69.5	75.8	61.3	74.2	79.0	74.0	0		1 SW	10 Rm	24
25	9.9	29.799	75.9	84.0	70.6	83.0	84.7	82.7	0		2 NW	7 Rm M Fm	25
26	10.3	30.199	67.0	59.2	53.9	58.4	84.7	58.0	see p. 119	3.067	3 NE	10 Rm	26
27	10.2	30.346	63.9	70.6	49.3	69.8	69.7	69.6	0		2 NE	0 R Fm	27
28	10.3	30.348	65.7	71.9	51.8	70.9	74.2	70.2	0		1 SW	1 haze	28
29	9.9	30.201	67.2	75.1	55.9	74.0	80.3	73.2	0		1 SW	0 haze	29
30	10.0	30.070	71.7	78.1	61.0	76.9	85.5	76.5	0		1 SW	1 haze	30
	9.9	903.269 30.109 30.008	198.5.6 66.2	212.0.6 70.7	169.1.5 56.4	208.7.6 69.6	2293.9 76.5		4 3/8 see p. 119	3.828	42 1.4	110 3.7	

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1883phae.proj.16080

June 1884

Date	Diff. T. M.	Barometer	Attached Thermom.	No. 4	Wind	Clouds.	Zodiacal Light	Aurora.	Report to Signal Service
1	8.2	30.350	60.2	49.4	0 calm	0 P haze	Moonlight and twilight	Moonlight and twilight	None
2									None
3	8.0	29.861	68.0	70.4	0 calm	1 PRs 7m	Moonlight and clouds	Moonlight and clouds	None
4	8.1	30.040	72.6	71.0	1 SW	2 haze	Moonlight and haze	Moonlight and haze	None
5									Obsc.
6	8.6	30.078	74.0	70.4	1 SW	4 P 7m haze	Moonlight and haze	Moonlight and haze	None
7	8.6	30.030	75.8	73.1	1 SW	8 Pm 7m	Cloudy	Cloudy	None
8	8.6	29.880	76.0	72.2	2 S	0 P haze	Moonlight	Moonlight	None
9	9.0	29.784	74.5	68.4	2 S	1 Pm 7m	Moonlight	Moonlight and clouds	None
10									Obsc.
11									Obsc.
12									Obsc.
13	8.4	30.340	66.5	57.3	0 calm	7 Pm 7m →	Cloudy	Cloudy	Obsc.
14	8.2	30.536	63.4	51.7	1 SE	1 PRs 7m	Twilight and clouds	Twilight	None
15	8.2	30.374	64.9	56.9	1 S	1 PRs 7m	Twilight and clouds	Twilight	None
16	8.7	30.078	69.1	71.2	0 W	5 P 7m	Twilight and clouds	Twilight and clouds	None
17	8.2	30.085	75.2	73.8	1 S	1 PRs haze	Twilight	Twilight	None
18	8.9	29.963	76.0	69.9	1 S	0	Twilight	Twilight	Aurora
19									None
20									None
21	10.2	29.893	79.8	75.4	1 W	5 Rs haze	Hazy	Hazy	None
22									None
23	8.5	30.144	72.4	65.4	2 S	2 PRs haze	Twilight	Twilight	None
24									Obsc.
25									Obsc.
26	8.7	30.278	67.1	56.5	1 E	0	Moonlight and twilight	Moonlight and twilight	None
27	9.0	30.328	69.8	61.1	0 calm	6 P haze	Cloudy	Cloudy	Obsc.
28	8.6	30.266	73.3	67.1	1 SW	4 P haze	Moonlight and haze	Moonlight and haze	None
29	8.8	30.134	76.1	72.5	2 S	0 haze	Moonlight	Moonlight	None
30	8.8	30.028	78.1	72.9	1 SW	1 haze	Moonlight	Moonlight	None

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June, 1884

2, 9.7 P.M. Day rather clear and cool; evening somewhat hazy; no aurora seen.

3, 10.2 A.M. Yesterday rather clear and cool; evening somewhat hazy with faint lunar halo about 8 P.M.; no aurora seen.

3, 10.0 P.M. Day warm, cloudy at times; evening rather clear, with thin clouds, increasing; irregular lunar halo about 9 P.M.; no aurora seen.

4, 10.2 P.M. Day hot, mostly clear; evening somewhat hazy; no aurora seen.

5, 10.0 P.M. Day hot, somewhat cloudy; evening hazy, with clouds becoming thicker.

7, 9.3 A.M. Yesterday hot and hazy; evening hazy and somewhat cloudy; no aurora seen.

7, 8.6 P.M. Day hot and rather clear; thunder in the west 4 to 6½ P.M., with a little lightning about 6 P.M.; a few drops of rain about 6⅓ P.M.; afterwards somewhat clear.

7, 10.2 P.M. Evening gradually becoming clear; little haze or clouds now; no aurora seen.

8, 10.9 P.M. Day and evening hot and clear; no aurora seen.

9, 11.2 P.M. Day hot and mostly clear; evening rather clear with passing clouds; lightning without thunder in the northwest 8½ to 9 P.M.

11, 9.5 A.M. Yesterday cloudy and cool day and evening.

12, 9.7 A.M. Yesterday cloudy and cool day and evening.

13, 9.7 A.M. Yesterday cloudy with rain in the evening.

14, 10.2 A.M. Yesterday rather clear; evening mostly cloudy.

14, 9.6 P.M. Day cool and rather clear with thin clouds; thin clouds also in the evening, thicker in the northwest; no aurora seen.

15, 11.5 P.M. Day and evening clear with a few clouds; no aurora seen.

16, 10.8 P.M. Day rather cloudy and warm; evening rather clear, with some clouds [illegible] no aurora seen.

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1668phot.proj.1668C

June 1882.

17, 10.5 P.M. Day hot and rather clear; evening mostly clear with some haze and at first clouds; no aurora seen.

18, 11.3 P.M. Day hot and clear; evening clear; some appearance of auroral arch, 9 P.M. and later; sky dark below.

19, 1.5 P.M. Day hot, becoming cloudy; thunder heard about 1h 20m P.M. At 1h 27m P.M. a moderate breeze began from the north, clouds moving eastwards.

19, 10.9 P.M. Rather heavy shower beginning about 2.8 P.M. Cloudy till evening, gradually becoming clear with haze; no aurora seen. Some thunder and lightning before and during the shower; one smart peal of thunder.

21, 9.9 A.M. Yesterday hot and rather clear, with haze; no aurora seen.

21, 10.7 P.M. Day hot and rather clear, becoming cloudy towards night; clearer again about 9 P.M. and later; no aurora seen.

23, 9.9 A.M. Yesterday rather clear and warm; evening rather clear with haze; no aurora seen.

23, 10.8 P.M. Day warm and rather clear; evening rather clear, some haze and clouds; no aurora seen.

25, 9.9 A.M. Yesterday hot and somewhat cloudy; evening cloudy.

25, 5.5 P.M. Day mostly cloudy, with thundershowers; rain most of the afternoon; very heavy for a time about 4 P.M., with northeast wind.

25, 5.7 P.M. Gauge 16 3/4 ounces; 1.478 inches; still raining.

26, 10.3 A.M. Gauge 18 ounces; 1.589 inches. Yesterday evening rainy.

26, 10.9 P.M. Day cloudy at first, clear towards night; evening clear; no aurora seen.

28, 10.3 A.M. Yesterday rather clear; thick haze and some clouds in the evening.

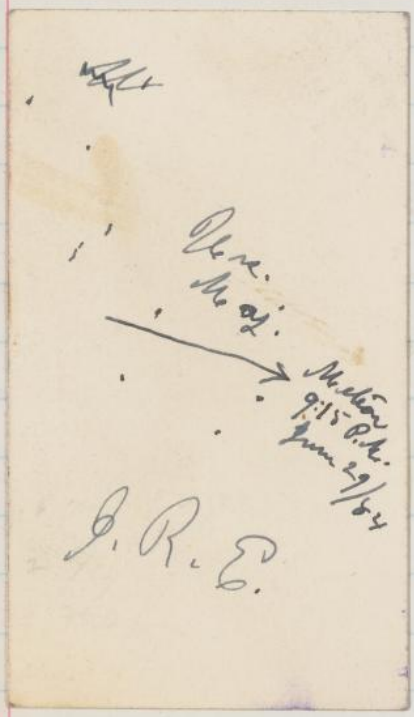
28, 11.6 P.M. Day warm and hazy; evening hazy; no aurora seen.

29, 10.9 P.M. Day rather hot and clear; evening clear; no aurora seen; meteor seen by Mr. Edmands; see his record, p. 120.

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June 1884.



30 11.6 P.M. Day and evening hot and rather clear, with some haze; no aurora seen.

Report to Signal Service, sent July 1, 1884.

Aurora — looked for every clear evening; results as follows:
June 18. Some appearance of an auroral arch 9 P.M. and later; sky dark below.

Zodiacal light — not seen.

Lunar halos. June 2. Faint lunar halo about 8 P.M.
June 3. Irregular lunar halo about 9 P.M.

Thunder and lightning. June 7. Thunder in the west 4 to 6½ P.M. with a little lightning about 6 P.M.; a few drops of rain about 6h 20m P.M.
June 9. Lightning without thunder in the northwest 8½ to 9 P.M.
June 19. Thunder heard about 1h 20m P.M.; at 1h 27m P.M. a moderate breeze began from the north, clouds moving eastwards; rather heavy shower beginning about 2h 50m P.M. preceded and accompanied by some thunder and lightning; one smart peal of thunder.
June 25. Day mostly cloudy, with thunder showers, followed by heavy rain in the afternoon and night; total rainfall 3.07 in.

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July 1884

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Date	7 A.M. Barometer	Attached thermometer	No. 4	Minimum before and after setting	Maximum before and after setting	Gauge	Rainfall in inches	Wind	Clouds	Date
1	10.3 29.950	74.0	79.1	66.5	77.4 86.5	77.6	0	1 SW	9 Pm Fm	1
2	10.0 29.826	76.0	80.9	69.2	79.3 85.2	79.3	0	1 SW	10 Pm	2
3	10.0 29.986	77.1	77.8	70.2	76.4 88.0	77.0	0	2 NE	8 Pm Fm	3
4	10.2 30.119	72.2	74.4	61.0	73.4 79.2	74.3	0	2 E.S.E.	7 R. Ra.-haze also.	4
5	9.7 29.900	73.0	74.4	63.1	73.1 76.2	74.3	11½ oz.	1.015	2 S.S.W.	10 Pm.	5
6	9.7 29.796	72.9	73.2	66.9	72.3 80.2	73.9	2 oz.	0.177	3. S.W.	10 Pm.	6
7	8.9 29.932	71.7	67.7	61.7	67.1 80.8	68.8	0		2. N.W.	8 Ra.	7
8	10.2 29.889	71.0	67.2	62.1	66.1 77.2	66.7	0¼	0.011	0 NE	10 Pm	8
9	9.6 29.706	69.0	68.8	59.4	68.0 68.0	68.0	7¾	0.684	2 N	10 Pm Fm	9
10	9.8 29.764	69.2	70.2	59.2	69.2 75.4	70.2	0⅞	0.077	1 N.W.	7 R. Ra. Pm.	10
11	9.2 29.950	70.8	73.0	61.0	72.0 78.8	72.5	0		1 S.W.	1 R. Ra.	11
12	9.7 29.886	73.8	76.3	65.4	74.9 82.6	75.0	0		1 SW	10 Pm	12
13	10.7 29.685	71.5	68.2	61.3	67.0 83.3	69.2	See p. 125		1 W.	10 Pm. Pr.	13
14	9.2 29.594	67.0	65.4	55.9	64.8 75.4	65.9	2⅜	0.210	3 N.W.	3 Fm. Pm.	14
15	10.0 29.720	67.0	67.3	56.5	66.3 72.6	66.8	0⅛	0.011	3 NW	5 M Fm →	15
16	10.1 29.700	66.8	67.1	52.3	66.0 72.7	66.5	0		2 NW	4 Pm M Fm →	16
17	10.5 29.756	67.7	71.2	56.2	70.1 71.0	70.7	0⅜	0.033	2 NW	6 Pm M Fm ↘	17
18	10.8 29.924	69.3	73.4	60.0	72.1 74.8	72.2	0		1 SE	8 Pm M Fm	18
19	9.9 29.868	70.0	74.7	61.1	73.5 78.0	73.7	3½	0.309	1 S	1 Pm M Fm	19
20	9.8 29.795	68.7	67.7	57.0	67.0 79.2	67.2	0¾	0.066	2 W	0 Fm	20
21	10.3 29.784	66.0	66.3	52.5	65.1 72.7	65.6	0		2 W	8 M Fm →	21
22	10.7 29.850	68.2	70.9	56.1	69.8 70.7	70.0	0		1 W	10 Pm Fm	22
23	10.3 29.912	70.2	78.9	60.2	77.1 77.3	76.8	0		1 S	4 haze	23
24	10.1 29.796	74.0	76.3	67.3	75.2 84.3	75.5	0¼	0.022	2 NW	1 M Fm	24
25	9.7 29.902	72.4	70.1	64.3	69.0 82.3	69.7	0½	0.044	1 SW	3 Fm	25
26	10.5 30.028	68.9	68.6	52.4	67.6 78.2	68.0	0		2 SE	2 P R Ra	26
27	10.6 30.049	70.5	72.3	59.2	71.0 72.7	71.2	0		2 E	5 Pm M Fm → Fm ↗	27
28	10.4 29.938	67.0	65.6	53.9	64.5 72.0	65.7	5⅜	0.474	1 NE	7 M Fm	28
29	10.4 29.935	67.7	65.0	60.2	64.0 71.9	64.1	1¾	0.154	1 SE	10 Pm; a little rain	29
30	10.3 29.813	63.8	60.2	54.9	59.7 64.3	60.0	8¾	0.772	1 N	10 Pm Fm; a little rain	30
31	10.1 29.872	70.2	76.2	59.2	75.1 75.2	75.0	0		2 SW	8 Pm Fm	31
	925.592 / 29.858	2177.6 / 70.2	2208.5 / 71.2	1866.2 / 60.2	2174.1 / 70.1	2386.7 / 77.0	2190.7 / 70.7	46	4.059	49 / 1.6	205 / 6.61	

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Date	Time P.M.	Barometer	Attached thermometer	No. 4	Wind	Clouds	Zodiacal light	Aurora	Abstract
1	8.8	29.904	78.2	73.4	2 SW	1 Pm Fm	Moonlight	Moonlight	None
2	8.6	29.827	80.9	77.9	2 S	1 Rs Fm	Moonlight	Moonlight	Aurora
3	8.6	30.034	76.6	68.3	1. N. E.	None, slightly hazy	Moonlight.	Moonlight.	None
4									Obsc.
5	11.7	29.800	75.2	70.0	1 S.S.W.	10 Pm.	Cloudy.	Cloudy.	Obsc.
6	7.7	29.812	77.4	74.3	2 S. W.	7 Rs. P.	Twilight.	Twilight.	None
7									Obsc.
8									Obsc.
9	7.6	29.672	73.5	68.1	1. N. N.W.	9 Pm. Pr.	Cloudy.	Cloudy.	Obsc.
10	8.4	29.864	75.9	70.6	2. S.W.	3 P.	Twilight.	Twilight.	Obsc.
11	8.4	29.951	78.4	72.3	1 SW	5 Pm Fm	Twilight and clouds	Twilight and clouds	None
12									Obsc.
13	9.2	29.592	72.8	63.1	1 N.W.	None.	None seen.	See fo. 125.	Aurora.
14	8.6	29.692	70.2		2 NW	7 Pm Fm	Cloudy	Cloudy	Obsc.
15	8.5	29.760	70.9	64.8	1 NW	1 Pm Fm	Twilight	Twilight and clouds	None
16	8.5	29.707	68.9	62.3	0 SW	0 Pm Rs Fm.	Twilight	Twilight and clouds	None
17	8.7	29.846	72.4	66.8	0 calm	5 Pm Fm	Twilight and clouds	Twilight and clouds	None
18									Obsc.
19									Obsc.
20	8.2	29.804	72.7	62.9	2 W	2 Pm Fm	Twilight and clouds	Twilight	Aurora
21	8.3	29.863	70.2	63.5	0 calm	1 Pm Fm	Twilight	Twilight and clouds	None
22	8.3	29.896	73.8	70.2	1 W	4 P Haze Fm	Cloudy	Cloudy	None
23									Obsc.
24									Obsc.
25	8.7	29.950	76.2	67.3	0 calm	0 P Rs	None	Twilight and clouds	Aurora
26	9.8	30.030	72.7	63.4	0 calm	0	None	None	None
27									Obsc.
28	8.6	29.978	72.0	62.7	0 calm	4 P Rs haze	Cloudy	Cloudy	None
29									Obsc.
30	8.3	29.860	71.4	66.4	1 S	0 P	Moonlight	Moonlight	None
31									Obsc.

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July 1884.

1, 9.6 P.M. Day hot and mostly rather cloudy; evening clear at first, becoming cloudy at 9½ P.M.; no aurora seen.

2, 10.3 P.M. Day hot and at first cloudy, with a few drops of rain; mostly clear towards night; evening rather clear at first; lightning without thunder in the southwest at 9 P.M. and later; aurora suspected by E.C.P. at 9½ P.M.; clouds came on about 10 P.M.

3. 10.7 P.M. Day rather warm in morning with winds shifting to east and somewhat cooler weather in afternoon. Somewhat foggy during afternoon and evening. No aurora seen. W.

5. 10.0 A.M. Yesterday cool and pleasant during day, with increasing cloudiness towards night. Began raining about 9½ P.M., and at 11½ P.M. as well as through the night at intervals, rainfall quite heavy. Dark clouds still cover the sky threatening more rain. No aurora seen last evening. W.

5. 11.7 P.M. Day rather cool and generally cloudy. Rainy at intervals during the latter part of evening. Wind generally south. No aurora seen. W.

6. 7.7 P.M. Day rather cool with clearing weather. Wind generally South west. W.

7. 8.9 A.M. No aurora seen last evening. Moonlight. W.
Solar halo at present time with a radius of about 10° and 120° of arc. W.

8, 10.2 A.M. Yesterday afternoon and evening cloudy.

9. 9.6 A.M. Yesterday cloudy day and evening, with rain.

9. 7.6 P.M. Day rather cool, and cloudy. Rain at intervals, especially in latter part of afternoon when there was also a heavy shower. W.

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July 1884.

10. 9.3 A.M. No aurora seen last evening. Generally cloudy. W.

10. 8.4 P.M. Day mild and comfortable. Cloudy most of the time with tendendency to clearing. Clouds rising at present time, and coming on from North west. W.

11. 9.2 A.M. No aurora seen last evening. Cloudy and moonlight. W.

11, 10.1 P.M. Day mostly clear; increasing clouds and haze in the evening; no aurora seen,

13. 10.7 A.M. Yesterday rather warm and sultry, - also, with gradually increasing cloudiness. Some rain in the evening and towards morning. Raining at present time, consequently gauge undisturbed. No aurora seen. W.

13. 9.2 P.M. Day comfortable and partly cloudy. Brisk shower with considerable wind at about 3 o'clock this P.M. gradually clearing afterwards. Clear this evening. ~~Some~~ Lightning and some thunder accompanied shower this afternoon. Some lightning this evening. An auroral arch in north, about 5° ~~the~~ altitude, with fine streamers extending to an altitude of 20°, at present time. W.

14, 10 P.M. Evening mostly cloudy; sky sometimes clear overhead. There was lightning without thunder during the evening of July 14.

15, 11.2 P.M. Day and evening cool, mostly rather clear, with occasional clouds; no aurora seen.

16, 11 P.M. Day rather cloudy, with occasional showers; evening rather clear; no aurora seen.

17, 9.6 P.M. Day and evening rather clear; some clouds; no aurora seen,

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July 1882

20, 9.8 A.M. Yesterday mostly cloudy and warm; rain late in the evening, preceded by a little lightning in the west, without thunder.

20, 11.0 P.M. Day and evening mostly clear; slight suspicion of auroral light at present over clouds in the north.

21, 10.5 P.M. Day ~~cloudy~~ mostly cloudy; evening rather clear with some clouds; no aurora seen.

22, 11.2 P.M. Day cloudy at first, afterwards rather clear; evening rather clear; no aurora seen.

24, 10.1 A.M. Yesterday hot and hazy; evening cloudy with a little rain.

25, 9.7 A.M. Yesterday hot, becoming cloudy; evening cloudy.

25, 11.2 P.M. Day hot, rather cloudy; evening mostly clear, now rather hazy and cloudy; auroral light most of the evening among clouds in the north.

26, 10.9 P.M. Day and evening mostly clear and warm; now some haze and clouds; no aurora seen; two white clouds in the southwest about 10.8 P.M. one near horizon, the other higher, probably due to reflected light from some fire.

28, 10.4 A.M. Yesterday cloudy with rain in the afternoon and evening.

28, 10.9 P.M. Day rather cloudy, becoming clear during the evening; no aurora seen.

29, 10.3 A.M. Yesterday cloudy day and evening with rain.

30, 11.6 P.M. Cloudy with rain at first; afternoon and evening clear; no aurora seen.

Aug. 1, 11.2 P.M. Yesterday mostly cloudy; rain in the evening.

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Report to Signal Service, dated Aug. 5, 1884.

Aurora looked for every clear evening; results as follows:

July 2. Aurora suspected at 9½ P.M.; clouds came on about 10 P.M.

July 13. Auroral arch and streamers about 9¼ P.M.

July 20. Slight suspicion of auroral light at 11 P.M., over clouds in the north.

July 25. Auroral light most of the evening, among clouds in the north.

Zodiacal light not seen.

Solar halo July 7, 9 A.M. ☉; imperfect.

Thunder and lightning as follows;

July 2. Lightning without thunder in the southwest at 9 P.M. and later.

July 11. Lightning without thunder ~~at~~ the evening.

July 13. Shower about 3 P.M., with lightning and some thunder; some lightning in the evening.

July 19. Rain late in the evening, preceded by a little lightning in the west, without thunder.

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August 1884

Date	Time P.M.	Barometer	Attached thermometer	No. 4	Minimum before and after setting	Maximum before and after setting	Gauge	Rainfall in inches	Wind	Clouds	Date
1	9.2	29.910	69.3	69.6	64.9	68.7 79.2	69.0	2 1/2	0.221	2 NW	0	1
2	10.0	30.180	69.8	70.6	60.4	69.4 77.3	69.9	0		1 SW	4 Rs Fm	2
3	10.1	30.113	70.7	75.3	59.5	74.1 77.6	74.0	0		1 SW	1 P Rs Fm	3
4	10.3	30.007	72.7	76.9	62.6	75.3 82.0	75.5	0		1 S	10 Pm Fm	4
5	9.8	30.000	74.5	74.3	71.2	73.0 82.2	73.2	0 1/4	0.022	1 SW	10 Pm; raining	5
6	10.4	29.993	74.5	76.9	68.4	75.9 77.6	76.0	9 1/4	~~0.816~~ 0.776	1 SW	6 P Rs Fm	6
7	10.2	30.064	73.4	75.3	63.3	73.9 81.9	74.0	0		1 S	10 Pm	7
8	10.5	30.086	71.1	71.8	60.9	70.7 74.9	69.0	25 1/4	2.228	1 SW	5 Rs R M Fm	8
9	10.2	30.324	71.0	68.2	61.1	67.2 77.2	68.0	0		2 NE	6 P Rs	9
10	10.8	30.165	67.2	70.8	52.2	69.3 71.0	69.7	0		2 NE	6 P Fm	10
11	10.3	30.060	68.0	65.8	60.6	64.8 70.3	65.2	0 1/8	0.011	2 NE	10 Pm	11
12	10.5	30.233	67.7	70.7	56.8	69.5 69.6	69.5	0		1 NE	9 P	12
13	10.6	30.162	67.0	61.7	59.1	60.8 71.2	61.2	1 1/2	0.132	2 NE	10 Pm; a little rain	13
14	10.5	30.130	61.8	67.5	60.0	66.3 67.3	66.8	1	0.088	2 N	10 Pm	14
15	10.7	30.049	68.1	74.9	57.4	73.8 73.8	73.8	0		1 N	1 Rs Fm haze	15
16	10.6	30.199	69.7	76.0	59.2	75.0 79.8	74.8	0		1 E	2 P M Fm	16
17	10.3	30.144	70.4	76.3	70.3	76.0 77.8	74.7	0		1 SW	0 haze	17
18	—	—	—	—	—	— —	—	—	—	—	—	18
19	8.9	30.172	75.0	67.8	66.1	66.7 86.7	68.0	0		2 NE	10 P	19
20	10.3	30.089	73.3	77.0	64.2	76.0 75.8	75.8	0		0 SE	2 haze	20
21	10.4	30.0415	76.0	79.4	68.8	78.0 81.0	78.0	0		2 SW	7 Pm Fm	21
22	10.0	30.000	76.0	78.9	68.9	77.3 83.0	77.6	0		2 S	8 Pm Fm	22
23	9.9	29.966	75.0	73.8	65.0	72.3 84.0	73.0	2 3/4	0.243	2 W	9 P Fm	23
24	9.6	30.000	71.5	67.2	62.9	66.4 78.1	67.0	0		2 W	0	24
25	9.5	30.328	62.7	59.0	48.2	58.3 71.0	58.8	0		2 N	3 R Rs	25
26	10.4	30.108	64.8	61.8	52.6	61.0 64.9	61.8	1 1/8	0.099	1 S	10 Pm Fm	26
27	10.2	30.159	66.5	67.0	58.1	66.2 68.4	66.8	1 1/2	0.132	2 NW	1 Rs M Fm	27
28	10.0	30.165	66.9	65.0	54.4	64.0 72.0	64.5	0		1 S	1 haze	28
29	10.2	29.938	67.5	69.0	58.4	67.7 75.5	68.0	0		1 S	10 Pm; a little rain	29
30	9.7	29.822	70.8	75.9	67.6	74.7 74.9	74.9	7 3/4	0.682	3 S	10 Pm Fm	30
31	9.4	29.798	72.0	72.9	66.1	71.5 80.0	72.0	0		1 SW	10 P	31
	303.5	902.409	2104.9	2137.3	1849.2	2102.8 2286.0		53	~~4.656~~ 4.676	44	184	
	10.1	30.080	70.1	71.2	61.6	70.1 76.2				1.5	6.0	

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Date	time P.M.	Barometer	Attached thermometer	No. 4	Wind	Clouds	Zodiacal light	Aurora	Abstract
1	8.5	30.050	74.4	69.1	0 calm	0	Moonlight	Moonlight	None
2	8.4	30.168	75.4	69.6	1 SW	3 Rs Fm →	Moonlight and clouds	Moonlight and clouds	None
3	8.3	30.060	75.8	68.8	0 S	5 PRs	Moonlight and clouds	Moonlight and clouds	None
4									Obsc.
5									Obsc.
6	8.3	30.018	77.5	73.7	0 calm	0 Fm	Moonlight	Moonlight	None
7									Obsc.
8									Obsc.
9	8.5	30.275	72.1	61.9	0 NE	1 PRs	Moonlight and clouds	Moonlight and clouds	None
10									Obsc.
11	7.9	30.141	70.7	62.8	0 calm	4 PRs Fm	Twilight and clouds	Twilight and clouds	None
12									Obsc.
13									Obsc.
14	9.5	30.094	70.2	63.3	0 SE	0	None	None	None
15	9.4	30.138	78.0	65.4	1 N	0 haze	None	None	None
16	7.7	30.214	75.2	68.1	0 NW	5 PRs haze	Cloudy	Cloudy	Obsc.
17	10.3	30.100	76.2	72.0	1 S	1 haze	None	None	None
18	8.3	30.111	80.3	76.9	1 S	1 PRs haze	None	None	None
19									Obsc.
20	7.8	30.030	79.1	74.7	0 calm	2 PRs haze	Cloudy	Hazy	None
21									Obsc.
22									Obsc.
23	9.9	29.918	77.3	70.[illegible]	1 S	1 haze	Hazy	Hazy	None
24									None
25									Obsc.
26	8.8	30.008	67.2	65.8	1 S	1 haze	Moonlight	Moonlight	None
27	10.8	30.170	69.8	61.0	1 SE	0 Rs	None	None	None
28	8.1	30.094	72.2	63.8	2 W	5 PRs	Moonlight and clouds	Moonlight and clouds	Obsc.
29									Obsc.
30		?							Obsc.
31	8.5	29.824	75.9	68.3	2 NW	0	Moonlight	Moonlight	None

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August 1884

1, 11.2 P.M. Day clear and warm; evening clear at first, now mostly cloudy; no aurora seen.

3, 10.1 A.M. Yesterday mostly rather clear; evening somewhat cloudy; no aurora seen.

3, 10.7 P.M. Day somewhat cloudy; evening mostly clear; no aurora seen.

5, 9.8 A.M. Yesterday rather cloudy; evening cloudy.

6, 10.4 A.M. Yesterday cloudy with rain; heavy rain late in the evening.

6, 10.3 P.M. Day rather cloudy; thunder heard at $2\frac{55}{60}$ P.M. Evening clear at first, some clouds later; cloudy at 10 P.M.; no aurora seen.

8, 10.5 A.M. Yesterday cloudy with rain: heavy rain in the evening at times.

9, 10.2 A.M. Yesterday rather clear, cloudy towards night; evening cloudy.

9, 11.3 P.M. Thin clouds rather frequent day and evening; no aurora seen.

11, 10.0 P.M. Yesterday cloudy with a few drops of rain in the evening; today cloudy at first, clear towards night, evening somewhat cloudy, especially in the south; more cloudy now; no aurora seen.

13, 10.6 A.M. Yesterday cloudy day and evening.

14, 10.5 A.M. Yesterday cloudy day and evening; some rain.

14, 11.2 P.M. Day cloudy and rather warm, becoming rather clear with haze and some clouds: no aurora seen; band from Aquila now slightly visible as far as α and β Aquarii.

15, 11.7 P.M. Day and evening mostly clear and warm; no aurora seen.

17, 10.3 A.M. Yesterday rather clear and hot: evening rather cloudy.

17, 10.3 P.M. Day and evening hazy, rather hot; no aurora seen.

18, 1.8 P.M. Barom. 30.074; attached therm. 78.5; No. 4, 88.1; minimum (not set) 66.5; maximum (not set) 86.2; gauge 0; wind 1 S.; clouds 1 R M 7m.

~~18, 1.8 P.M.~~

18, 10.7 P.M. Day and evening hot, rather hazy; no aurora seen.

20, 10.0 P.M. Yesterday mostly cloudy and foggy; evening

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cloudy. Today rather clear and hot with occasional clouds; evening rather clear, with haze and some clouds; no aurora seen.

22, 10.0 A.M. Yesterday warm and rather cloudy; evening cloudy.

23, 9.9 A.M. Yesterday hot and mostly cloudy; between 7 and 9 P.M. some rain with a little thunder and lightning.

23, 9.9 P.M. Day and evening warm and rather clear, with haze and some thin clouds; no aurora seen.

26, 10.4 A.M. Aug. 24 clear and cool; no aurora seen. Yesterday rather cloudy; clouds increasing in the evening; rain later.

26, 10.1 P.M. Day cloudy, clear towards night; evening clear with some haze; lightning without thunder in the north; no aurora seen.

27, 10.8 P.M. Day and evening clear and warm; no aurora seen; moonlight early in the evening.

29, 10.2 A.M. Yesterday rather clear; evening mostly cloudy.

30, 9.7 A.M. Yesterday cloudy and sultry day and evening, with some rain.

31, 9.4 A.M. Yesterday cloudy and sultry day and evening.

31, 10.9 P.M. Day cloudy and sultry with a little rain, becoming clear and cooler toward night; no aurora seen.

Report to Signal Service, sent Sept. 6, 1884.

Aurora looked for every clear evening; none seen.

Zodiacal light not seen.

Thunder and lightning as follows:

Aug. 6. Rather cloudy; thunder heard at $2^h 55^m$ P.M.

Aug. 22. Between 7^h and 9^h P.M., some rain with a little thunder and lightning.

Aug. 26. During the evening, lightning in the north, without thunder.

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September 1884.

Date	7 h. M.	Barometer	Attached thermometer	No. 4	Minimum before and after setting	Maximum before and after setting		Gauge	Rainfall in inches	Wind	Clouds	Date
1	10.3	29.924	68.9	67.5	53.4	66.9	79.3	67.2	0		2 NW	0 Fm	1
2	10.3	30.175	66.5	67.8	52.1	67.0	71.6	67.0	0		1 S	1 haze	2
3	10.4	30.104	68.0	73.1	57.7	72.0	73.0	72.0	0		1 SW	1 haze	3
4	9.8	30.163	72.1	76.6	67.0	75.7	80.0	75.6	0		1 N	1 haze	4
5	10.6	30.139	76.7	83.0	69.3	82.0	86.4	82.0	0		1 W	3 PRs haze	5
6	10.2	30.075	74.2	74.4	62.4	73.2	86.0	73.7	0		2 SW	1 PRs Fm	6
7	10.1	30.110	74.4	67.3	63.0	66.2	83.0	67.2	0		2 SE	4 Pm M Fm ←	7
8	10.3	29.991	72.4	77.6	63.0	76.1	76.2	76.1	0		1 SW	2 PR Rs Fm haze	8
9	10.2	30.047	76.5	79.1	69.6	78.0	85.2	78.0	0 1/4	0.022	0 calm	5 P Fm → haze	9
10	10.2	30.058	77.5	81.0	70.4	80.0	85.0	80.0	0		1 N	0 haze	10
11	10.3	30.021	76.3	75.7	66.3	74.0	87.9	75.0	1 1/4	0.110	0 calm	10 P fog	11
12	10.4	30.096	72.2	67.1	61.2	66.2	79.9	67.0	2	0.177	2 NW	0 Fm	12
13	9.8	30.250	64.4	58.3	48.3	57.6	70.7	59.6	0		3 N.N.W.	1 Fm.	13
14	11.4	30.428	58.6	51.3	39.1	50.2	61.2	52.5	0		1 W.	1 Rs.	14
15	9.6	30.338	56.8	55.3	40.2	54.0	58.2	57.4	0		0 N.W.	10 Pm Pr.	15
16	9.6	29.946	61.5	62.2	52.4	64.0	64.3	64.6	0		3 S.W.	10 Pm Pr.	16
17	9.5	29.800	67.0	70.7	62.2	69.8	73.8	70.9	0		1 S.W.	2 Rs. Rm.	17
18	9.5	29.850	67.0	65.8	59.8	64.9	77.8	67.4	0		2 N.W.	8 Pm Pr.	18
19	10.7	30.250	62.2	58.2	46.6	57.1	70.3	59.8	0 1/8	0.011	2 N.E.	4 Fm Rm.	19
20	9.5	30.136	61.2	63.2	48.8	62.2	62.7	63.0	0		1 S.W.	7 Pm Fm.	20
21	10.3	30.214	58.4	55.4	44.9	54.7	68.8	56.2	0 7/8	0.077	2 N.N.W.	0.	21
22	9.7	30.086	59.7	62.7	45.2	61.3	62.5	62.8	0		2 S.W.	3 Pm Pr.	22
23	11.8	30.150	61.2	60.7	49.2	49.6	68.9	61.7	0 1/4	0.022	3 N.E.	10 Pm	23
24	9.9	30.208	58.1	57.2	48.9	56.1	56.6	56.9	See p. 136.		1 S.E.	10 P.-nimbus fog.	24
25													25
26													26
27	10.0	30.307	60.8	60.9	44.4	60.1	79.6	60.4	1	0.088	2 S	1 PRs Rm	27
28	10.4	29.915	65.1	69.7	58.4	68.4	68.6	68.5	0 5/8	0.055	2 SW	3 Fm	28
29	9.7	29.829	69.1	73.1	65.0	72.1	76.1	72.2	1 1/8	0.099	2 W	0 Fm	29
30	10.0	30.212	67.7	67.1	57.6	66.0	78.8	66.2	0		0 NW	9 P Fm Rs	30
		842.842	1873.9	1875.1	1569.8	1845.4	2072.0						
	10.1	30.102	66.9	67.0	56.1	65.9	74.0		7 1/2	0.661	41	107	
		-.103									1.5	3.8	
		29.999											

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Date	Time P.M.	Barometer	Attached thermometer	No. 4	Wind	Clouds	Zodiacal light	Aurora	Abstract
1	8.2	30.012	71.7	62.7	1 W	0	Moonlight	Moonlight-	None
2	7.9	30.158	72.2	64.7	1 SW	0	Moonlight	Moonlight	None
3	8.0	30.100	75.8	72.9	1 SW	1 haze	Moonlight	Moonlight	None
4	8.1	30.158	80.1	78.9	1 SW	1 haze	Moonlight	Moonlight	None
5	8.2	30.128	80.7	77.0	0 calm	5 P Rs	Moonlight and clouds	Moonlight and clouds	Obsc.
6	8.2	29.958	79.3	74.8	0 SW	2 haze	Moonlight and haze	Moonlight and haze	None
7	8.5	30.062	74.2	64.8	0 E	7 P Rs Fm →	Moonlight and clouds	Moonlight and clouds.	Obsc.
8									Obsc.
9	8.4	30.050	81.1	75.3	0 calm	6 P Fm	Cloudy	Cloudy	None
10	8.9	30.075	82.2	74.7	0 calm	2 P haze	Hazy	Cloudy	None
11	8.8	29.936	79.0	70.7	2 W	6 P Fm	Cloudy	None; some clouds	None
12	8.3	30.167	70.3	59.2	2 N	0	None	None	None
13	8.5	30.358	63.9	49.8	2 N.	0	None.	See p. 134.	Aurora
14	10.8	30.364	60.8	48.2	0 N.W.	2 Pr.	None.	None.	Aurora
15	8.4	30.200	62.9	54.9	1 S.W.	6 Pm Pr.	Cloudy.	None.	None
16	8.5	29.772	67.8	67.2	3 S.S.W.	8 Pm Pr.	Cloudy.	Cloudy.	None
17	8.1	29.764	72.2	69.5	0 S.W.	7 Pm Pr.	Cloudy.	Cloudy.	Aurora
18	8.2	30.078	68.8	61.3	1 N.	10 Pm.	Cloudy.	Cloudy.	Obsc.
19	9.3	30.270	64.2	52.5	0 S.W.	4 R Rs. haze.	Cloudy	Cloudy.	None
20	8.5	30.036	65.0	57.1	1 S.W.	1 Fm. haze.	None.	None.	None
21									None
22	12.7	29.998	64.8	62.1	0 S.W.	10 P.	Cloudy	Cloudy.	None
23	8.9	30.198	59.8	51.2	1 N.	10 Pm Pr.	Cloudy	Cloudy.	Obsc.
24	8.8	30.148	64.2	66.2	2 S.W.	3 Pm Pr. haze.	Cloudy	Cloudy.	Obsc.
25									Blank
26	10.7	30.394	64.3	58.2	0 calm	0 P	None	None	None
27	9.1	30.073	65.0	60.0	1 SW	4 P Fm	Moonlight and clouds	Moonlight and clouds	None
28									Obsc.
29	8.2	30.030	74.2	70.3	0 W	0 Rs	Moonlight	Moonlight	None
30									Obsc.

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September, 1884.

1, 10.7 P.M. Day and evening clear; no aurora seen.

2, 10.5 P.M. Day and evening clear; no aurora seen.

3, 10.3 P.M. Day and evening warm and clear, with a little haze; no aurora seen.

4, 10.9 P.M. Day and evening hot, mostly clear; a little haze; no aurora seen.

6, 10.2 A.M. Yesterday hot and rather clear; thin irregular clouds in the evening.

6, 11.6 P.M. Day and evening mostly hot and rather clear; no aurora seen.

7, 9 P.M. Day and evening rather cloudy; lightning without thunder in the north about 8 P.M.

8, 10.3 A.M. Thin scattered clouds late yesterday evening; somewhat more cloudy in the north

9, 10.2 A.M. Yesterday sultry and rather cloudy; a little rain, thunder, and lightning in the evening.

9, 10.6 P.M. Day sultry and rather cloudy; evening rather cloudy at first, now rather clear but hazy; no aurora seen.

10, 10.9 P.M. Day sultry; rather clear at first; afternoon mostly cloudy with a little thunder and lightning about 4 P.M. and later; moderate shower about 6¼ P.M.; frequent lightning without thunder in the southwest about 8 P.M.; rather clear 9 to 10½ P.M.; now cloudy; no aurora seen.

11, 11.6 P.M. Day sultry, cloudy and foggy at first; clearer afterwards; clouds in west with continuous rumble of thunder after 4 P.M.; moderate thunder shower about 5 P.M.; evening rather clear at 9 P.M. and later, with frequent thin clouds; no aurora seen.

12, 8.6 P.M. Day and evening clear and cool. β Urs. Min. now about same altitude as α Urs. Min., and decidedly brighter: ε Urs. Maj. = β Urs. Min. 3 α Urs. Min.

13, 10.8 P.M. Day cool and pleasant with some clouds.

Rather a fine aurora this evening: first noticed about 9h 30m and still visible.

Most of the evening it has had the form of a low bright arch about 7° or 8° above

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the horizon at the centre but at the present time there are fine streamers extending half way to the zenith and continually changing in form. H.

14. 10.8 P.M. Day cool and generally clear. Some cloud the latter part of day. No aurora seen.
Arora of last night over at about 11½ P.M. H.

15. 9.7 A.M. On coming out of Observatory last night after making previous record, it was seen that an aurora had started in North. There was a low mass of light with streamers but no definite arch. The streamers disappeared in a few minutes and the whole phenomenon when last seen, (about 11h 20m) seemed to be subsiding. H.

15. 8.4 P.M. Day comfortable and cool - slightly warmer however than yesterday. No aurora seen as yet. H.

16. 9.6 A.M. No aurora seen last evening. H.

16. 8.5 P.M. Day generally very windy, but comfortable as regards temperature. No aurora seen as yet. Clouds increasing. H.

17. 9.6 A.M. No aurora seen last evening. H.

18. 9.7 A.M. A diffuse but quite bright aurora seen through clouds in north at 9h 50m ~~P.M.~~ last evening. When last seen at about 10h 8m it was fully as bright as when first seen. One streamer visible in west at 10h 35m - none in north.
Yesterday somewhat warm, but generally comfortable. - somewhat cloudy throughout the day. H.

Supplementary to the above.
Miss. Winlock says that she saw a fine aurora

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streamer at about 11h ± 9m ± last evening, beginning at a point west of the zenith and extending through the zenith to the eastern horizon. W.

Sept. 16. 0.2 P.M. Day slightly warm with considerable cloudiness. Light rain at present time. No aurora seen. W.

Sept. 19. 10.9 A.M. Cloudy all last evening with light rain. Cleared between 12h and 2h this morning. No aurora seen. W.

Sept. 19. 9.4 P.M. Day generally cool and clear. Some clouds latter part of day, and increasing cloudiness in evening. No aurora seen as Feb. W.

Sept. 20. 9.4 A.M. No aurora seen last evening. W.

Sept. 20. 10.9 P.M. Day comfortable and generally cloudy. Clouds drifting from south to south west. A short but vigorous shower this afternoon accompanied by some thunder. Lightning without thunder this evening. Cleared about 2h 15m this evening. No aurora seen. W.

Sept. 21. 10.3 A.M. Gauge emptied. W.

Sept. 22. 9.7 A.M. Yesterday cool and comfortable. Generally clear. No zodiacal light or aurora seen. W.

Sept. 22. 12.7 P.M. Day cool and comfortable. Some cloudiness increasing this evening. No aurora seen. W.

Sept. 23. 0.7 P.M. Gauge emptied. 5/4 oz. water in bottle. W.

Sept. 23. 9.0 P.M. Day raw and chilly. Wind generally north east. Cloudy throughout day. No aurora seen. W.

Sept. 24. 10.1 A.M. A few drops of water in gauge but not enough to measure. Gauge undisturbed. W.

Sept. 24. 8.8 P.M. Day cool and cloudy in forenoon. Cleared somewhat in early part of afternoon. Lower

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cloudy later and during evening. Air warm and saturated with moisture the latter part of day and evening. No aurora seen.

W.

26, 10,7 P.M. Evening clear; some cloud in north near horizon; no aurora seen.

27, 10,4 P.M. Day mostly clear, cloudy towards night; partly clear 8½ to 10 P.M., more cloudy later; no aurora seen.

29, 9,7 A.M. Yesterday mostly clear and warm; evening mostly cloudy.

29, 11.0 P.M. Day mostly clear and warm; evening rather clear, with many thin clouds at times; no aurora seen.

Oct. 1, 9.8 A.M. Yesterday warm and rather cloudy; evening cloudy.

Report to Signal Service, sent Oct. 6, 1884.

Aurora looked for every clear evening (but no record with regard to Sept. 26); results as follows:

Sept. 13. Aurora noticed 7½ P.M. and as late as 10h 45m P.M.; generally low bright arch 7° to 8° altitude; long variable streamers when last noticed. Not seen at 11½ P.M.

Sept. 14. Irregular variable aurora about 11 P.M.; some streamers.

Sept. 17. Bright diffuse aurora seen through clouds in north at 9h 30m P.M.; continuing at 10h 35m P.M., with one streamer visible in the west. About 11 P.M. a streamer from eastern horizon to a point west of the zenith.

Zodiacal light not seen.

Thunder and lightning: Sept. 7. Lightning without thunder in the north about 8 P.M.

Sept. 8. A little rainy thunder and lightning in the evening.

Sept. 10. A little thunder and lightning about 4 P.M. and later; moderate shower about 6¼ P.M.; frequent lightning without thunder in the southwest about 8 P.M.

Sept. 11. Clouds in the west, with continuous rumble of thunder after 4 P.M.; moderate thunder shower about 5 P.M.

Sept. 20. A short but vigorous shower in the afternoon, with some thunder. Lightning without thunder in the evening.

Observation of Gegenschein reported by E. E. Barnard, Nashville Tennessee, Monday, Sept. 15, 1884, at 11h 30m (presumably Central Time), as follows: large Gegenschein in approx. 23h 30m, S 0°; 15° or 20° diam.; irregular patch of haze; fine night.

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October 1884.

Date	7 A.M.	Barometer	Attached thermometer	No. 4	Minimum before and after setting	Maximum before and after setting		Gauge	Rainfall in inches	Wind	Clouds	Date
1	9.8	30.123	67.3	71.3	60.8	70.3	72.0	71.7	0 1/8	0.011	1 W	0 M Fm	1
2	9.7	30.385	64.4	55.2	52.1	54.3	79.2	55.6	0		2 NE	10 P	2
3	10.0	30.437	59.1	52.2	44.1	51.2	58.3	52.4	0		1 E	10 P; a little rain	3
4	9.5	29.880	59.7	66.1	48.8	65.3	65.5	65.2	0 1/4	0.022	1 W	8 P Fm	4
5	9.5	29.914	66.7	62.5	61.3	61.7	78.0	62.3	3 5/8	0.320	2 N	0 M Fm	5
6	10.0	29.970	59.0	53.3	42.2	52.2	64.0	53.0	0		1 N	10 Pm; a little rain	6
7	10.3	29.809	59.9	63.2	48.8	62.5	62.6	62.6	0 1/2	0.044	2 NW	0 M Fm	7
8	10.8	29.890	58.1	57.6	43.5	56.8	64.7	57.2	0		1 SW	0 Rs haze	8
9	9.8	30.042	56.5	46.9	42.9	46.1	66.0	47.4	1	0.088	2 N	0 Rs Fm	9
10	10.4	30.230	52.8	48.7	32.3	47.9	51.9	48.9	0		1 N	0	10
11	10.4	30.149	57.7	62.9	43.8	62.0	61.9	61.5	0		3 SW	7 Pr Rs R	11
12	9.4	29.994	63.5	69.1	60.1	68.0	69.9	68.1	0		2 SW	5 Pr Rs	12
13	9.9	29.844	64.9	67.6	59.9	66.5	72.5	67.0	1 5/8	0.143	2 SW	9 Pm Rsn Fm /	13
14	10.3	30.195	55.0	45.7	39.0	45.0	72.5	46.0	0		2 N	10 Pm Fm	14
15	11.0	30.282	48.9	42.4	32.1	41.8	46.0	43.0	0		2 NW	0 M	15
16	10.8	30.046	49.0	45.6	30.3	44.3	46.0	45.2	0		0 SE	10 Pm Fm —	16
17	10.5	29.632	56.8	63.3	44.3	62.2	62.4	62.4	0		2 W	5 Pm Rs Fm —	17
18	10.2	29.720	52.7	48.0	35.0	46.8	63.0	48.0	0		1 N	10 P Fm	18
19	11.0	30.375	50.0	42.2	31.1	41.2	51.0	42.3	0 1/2	0.044	2 NW	1 Rs	19
20	10.2	30.236	58.0	66.3	41.2	65.1	65.3	64.8	0 1/4	0.022	2 SW	0	20
21	10.4	30.318	60.0	63.7	50.9	62.8	71.8	63.0	0		1 N	1 haze	21
22	10.2	29.967	59.0	68.4	44.3	67.0	67.9	66.0	0 1/8	0.011	4 SW	7 M Fm /	22
23	9.8	29.766	56.3	51.7	49.1	50.9	73.0	52.0	6	0.530	2 NW	5 Rs Fm	23
24	10.3	30.132	50.2	44.8	35.0	44.1	56.0	45.1	0		2 NW	5 M Fm —	24
25	10.6	30.076	48.9	44.8	34.0	44.0	46.0	44.9	0		1 S	10 Pm	25
26	9.9	30.497	44.6	36.1	29.7	36.0	47.7	37.3	0		2 NW	0	26
27	9.8	30.430	51.3	51.2	35.1	50.1	50.4	50.8	0		2 S	10 Pm Fm /	27
28	9.8	30.057	58.5	62.8	50.0	61.9	62.0	61.7	0		2 SW	10 Pm Fm /	28
29	9.5	30.368	50.7	44.5	37.9	43.7	62.1	44.8	0 3/4	0.066	2 N	4 Pr Rs Fm	29
30	10.3	30.200	51.9	43.7	41.8	42.9	49.9	44.0	2	0.177	2 NE	10 Pm; raining	30
31	10.8	29.954	50.4	38.8	37.6	38.0	44.8	39.0	12	1.054	3 NE	10 Pm; raining	31
	10.2	30.094 / 30.076	56.2	54.2	1339.0 / 43.2	53.3	1904.3 / 61.4		28 3/4	2.537	55 / 1.8	167 / 5.4	

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October 1884.

Date	Time P.M.	Barometer	Attached thermometer	No. 4	Wind	Clouds	Zodiacal light	Aurora	Abstract
1									Obsc.
2									Obsc.
3									Obsc.
4									Obsc.
5	8.0	29.995	66.1	53.7	0 calm	0	Moonlight-	Moonlight-	None
6	8.0	29.789	62.0	53.8	0 calm	0 P fog	Moonlight-	Moonlight-	None
7	8.0	29.891	62.2	54.3	1 N	0	Moonlight-	Moonlight-	None
8									Obsc.
9	8.0	30.136	57.1	43.8	0 N	0	Suspected	None	None
10	8.5	30.232	59.3	48.8	0 calm	0	Suspected	None	None
11									Obsc.
12									Obsc.
13	8.8	30.050	63.2	51.1	1 N	0	Suspected	None	None
14									Obsc.
15	8.2	30.248	53.4	37.5	1 N	0	Suspected	None	None
16									Obsc.
17	8.0	29.727	57.6	49.7	1 NW	0 Rs	Suspected	None	None
18	8.7	30.006	54.2	39.8	2 NW	0 R	Suspected	None	None
19									Obsc.
20	8.7	30.246	63.1	59.2	1 SW	1 haze	Hazy	Hazy	None
21	7.8	30.224	61.6	50.8	0 E	2 haze	Hazy	Hazy	None
22									Obsc.
23	8.1	29.822	52.6	44.3	2 W	0	Suspected	None	None
24	8.3	30.238	45.8	36.7	0 calm	0 P Rs	Moonlight and clouds	None	None
25	7.8	30.171	49.0	40.0	3 NW	8 Pm Fm	Cloudy	Cloudy	None
26									Obsc.
27									Obsc.
28									Obsc.
29									Obsc.
30									Obsc.
31									Obsc.

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October 1884.

2, 9.7 A.M. Yesterday warm and mostly clear; evening mostly cloudy.
3, 10.0 A.M. Yesterday cool and cloudy day and evening; clouds thin and broken.
4, 9.5 A.M. Yesterday cool and cloudy day and evening; a little rain.
5, 9.5 A.M. Yesterday warm and rather cloudy; rain in the evening, with a little thunder and lightning.
5, 10.7 P.M. Day clear and rather cool; evening clear with some clouds at times; no aurora seen.
6, 10.5 P.M. Day at first cloudy and cool, with a little rain; becoming clear and warmer in the afternoon; evening nearly clear; no aurora seen.
7, 11.4 P.M. Day and evening clear and rather warm; no aurora seen.
9, 11.3 P.M. Yesterday clear at first, cloudy towards night, with rain in the evening. Today clear and cool day and evening; no aurora seen.
10, 11.0 P.M. Day and evening clear and cool; no aurora seen. Last night sufficiently frosty to kill tomato vines.
12, 9.4 A.M. Yesterday rather warm with thin clouds day and evening
13, 9.9 A.M. Yesterday warm and cloudy day and evening, with a little rain.
13, 11.6 P.M. Day and evening clear and rather warm; no aurora seen.
13, 11.7 P.M. Band from Pleiades visible as far as 27 Piscium; Gegenschein strongly suspected, filling space between α and β Arietis to the north, and μ and ξ Ceti to the south; nearly circular; centre half way from β Arietis to μ Ceti.

β Arietis	1h 48m.0	+20° 13′
μ Ceti	2 38.5	+9 36
Gegenschein	2 13.2	+14 54

13, 12.0 P.M. C. C. Wendell's position for Gegenschein is ⅓ of the way from α Arietis to β Ceti, with a diameter equal to the distance from β to γ Ceti, and diameter of extreme faintest portions equal to distance from β to θ Ceti.
S. C. Chandler also sees Gegenschein. Still

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farther west than Wendell.

α Arietis	2h 0m.4	+22° 54′
β Ceti	0 37.6	−18 39
Gegenschein (C.C.W.)	1 32.8	+9 3

15, 11.0 A.M. Yesterday cloudy and rather cold day and evening. Clear last night after midnight; no aurora seen.

15, 10.8 P.M. Day and evening rather cold and clear; no aurora seen. Region of Aries nearly as on Oct. 13; light not extending west of line from β Arietis to ξ1 Ceti; centre half way from μ Ceti to point half way from α to β Arietis; light connected on eastern side with the permanent maximum near δ Arietis and the borders of the Milky Way beyond.

α Arietis	2h 0m.4	+22° 54′
β Arietis	1h 48m.0	+20° 13′
Point midway between α & β Arietis.	1h 54m.2	+21° 33′
μ Ceti	2h 38m.5	+9° 36′
Gegenschein	2h 16m.3	+15° 34′

17, 10.5 A.M. Yesterday cloudy and cool, becoming warmer towards night.

17, 9.8 P.M. Day and evening rather warm, with occasional clouds; no aurora seen; now hazy with some clouds.

18, 11.8 P.M. Day cloudy and cool, with a little rain about 5 P.M.; evening mostly clear; no aurora seen; region when Gegenschein was suspected Oct. 13 and 15 now occupied only by a comparatively narrow belt, not occupying more than half the space between β Arietis and μ Ceti; this seems only the ordinary band from the Pleiades. Gegenschein not suspected either east or west of this region. To the east the borders of the Milky Way hinder observation.

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October 1884.

20, 10.2 A.M. Yesterday mostly cloudy, becoming rather warm; a little rain in the evening; clear today about 4 A.M.; no aurora seen.

20, 10.9 P.M. Day clear and warm; evening hazy; no aurora seen.

21, 10.5 P.M. Day and evening rather warm and clear, but with much haze; no aurora seen.

23, 9.8 A.M. Yesterday warm and mostly rather cloudy; rain in the evening.

23, 11.1 P.M. Day rather clear and cool; evening clear; no aurora seen; region south of 2 Aries as on Oct. 18.

24, 9.5 P.M. Day mostly clear and cool; evening at first clear; afterwards partly cloudy, with haze; no aurora seen.

25, 10.3 P.M. Day cloudy and rather cold, with a few drops of rain; rather clear towards night; evening partly clear with passing clouds; no aurora seen.

27, 9.8 A.M. Yesterday clear and rather cold; evening cloudy.

28, 9.8 A.M. Yesterday cloudy and rather warm day and evening.

29, 9.5 A.M. Yesterday cloudy and rather warm day and evening.

30, 10.3 A.M. Yesterday cloudy most of the day and in the evening.

31, 10.8 A.M. Yesterday cloudy and rainy day and evening.

31, 10.0 P.M. Day cloudy and cool, with rain and in the evening sleet.

Report to Signal Service, sent Nov. 6, 1884.

Aurora — looked for every clear evening; none seen.

Zodiacal light — suspected on the evenings of Oct. 9, 10, 13, 15, 17, 18, 23; observations on other evenings hindered by moonlight or clouds.

Thunder and lightning. — Rain in the evening of Oct. 4, with a little thunder and lightning.

Frost. — Minimum thermometer below the freezing point on the mornings of Oct. 16 and 19, but 32.3 on the morning of Oct. 10, when, however, the preceding night had been sufficiently frosty to kill tomato vines.

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Report to New England Meteorological Society sent Dec. 6, 1884, to Prof. W. Upton, Providence, R.I. (see note at foot of p. 147).

Station: Harvard College Observatory Cambridge Mass.
Latitude: +42° 22′ 48″.3 Authority: Am. Ephemeris 1887 (investigation by Chandler indicates a small correction).
Longitude: from Greenwich +4ʰ 44ᵐ 30ˢ.98 Authority: Am. Ephemeris, 1887.
Elevation above the sea: of ground, 74 feet. Authority: Record book A 6, page headed 207; see also printed report of G. P. Bond for 1861, p. 27. The assumption to be made is with regard to the "top surface of lower square base of granite pilaster" mentioned in record book as 75 feet above Sea.
Rain gauge: by Casella, funnel 5 inches in diameter; in use since August 1870.
Exposure: the gauge is placed about 100 feet west of the Observatory building; the nearest building to the gauge is a shed about 38 feet distant. The top of the funnel is about 8 inches above ground. It is surrounded by a slight wire fence about 3 feet high, found necessary to keep off dogs.
Maximum thermometer: Casella 13399, mercurial column divided by bubble of air.
Minimum thermometer: Green 2205, alcoholic with index.
Exposure: mounted on north side of Observatory building west of central tower, under a small shelter, open below.
See further remarks on these thermometers in record of observations sent for November, 1884.

The remarks below are not for publication.

General remarks: since 1879 no attempt has been made to keep up a regular meteorological service, as it has been considered that the observations made by the U.S. Signal Service will provide sufficiently for an ordinary weather record, and that the resources of the Observatory should be devoted to astronomical research. The barometer and the external thermometer are read on the arrival of the observer in the forenoon, but, owing to astronomical work, this time is too irregular to make the observations useful for strictly meteorological purposes. The usual time in 1884 has been about 10 A.M., and the maximum and minimum readings may be of sufficient use to be sent.
There has been no time since this blank was received to enter these memoranda until today.

P.O. address of observer: Harvard College Observatory, Cambridge, Mass.; the observer is usually Arthur Searle, but observations are sometimes made by others.
Date: Dec. 6, 1884.

The present reduced resources of the Observatory (after the expiration of the temporary subscription 1879–1883) offer no prospect that anything will be done to extend the meteorological service, or to obtain additional rain gauges or other instruments.

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November 1884.

Date	Time A.M.	Barometer	Attached thermometer	No. 4	Minimum before and after sitting		Maximum before and after sitting		Gauge	Rainfall in inches	Wind	Clouds	Date	Time P.M.
1	10.6	29.984	46.4	38.6	32.7	37.3	40.0	38.6	3 3/8	0.298	1 SW	10 Rm	1	
2	9.0	30.002	52.9	47.5	37.2	46.7	52.3	47.8	0		3 NW	9 P Rs Fm	2	7.9
3	10.4	30.390	49.8	43.3	32.2	42.7	50.3	43.9	0		1 NW	1 P Rs	3	8.
4	9.8	30.316	50.0	43.9	36.8	42.9	49.0	44.0	0		0 N	10 P	4	
5	10.4	29.500	55.0	50.2	42.8	49.3	55.0	50.4	3	0.265	3 W	5 Rm Fm →	5	
6	10.3	29.874	44.4	35.7	31.1	35.0	57.3	36.2	0		3 NW	0 Fm	6	9.
7	10.6	30.076	41.2	39.6	23.0	38.8	39.4	39.7	0		1 SW	10 P Fm	7	8.
8	10.6	29.950	48.0	42.8	38.0	41.9	47.8	43.0	0		3 NW	5 M Fm	8	8.
9	10.8	30.340	42.6	35.1	24.3	34.1	43.0	35.7	0		1 W	0 Rs	9	8.
10	10.3	30.218	45.3	46.8	31.2	46.1	46.3	46.3	0		2 SW	0	10	7.
11	10.4	30.003	51.0	53.1	41.0	52.2	54.0	52.9	0 1/8	0.011	1 SW	0 Rs haze	11	8
12	10.4	30.032	51.0	47.2	39.5	46.3	58.7	47.4	0		2 N	0 Fm	12	8.
13	10.5	29.926	47.1	45.1	29.9	43.9	50.3	44.7	0		1 S	9 Rm Fm	13	7
14	10.5	30.004	47.8	40.5	33.8	40.0	53.6	41.0	0		2 W	5 Rs Rm Fm	14	8
15	10.3	30.078	48.0	48.1	37.3	47.2	47.9	47.8	0		2 NW	0	15	8
16	10.4	30.094	46.1	40.9	26.1	40.0	51.9	41.0	0		1 S	0 haze	16	7
17	10.0	29.703	49.0	45.0	36.8	44.1	53.2	45.0	0		1 NW	8 Rm Fm	17	9
18	10.3	30.199	42.9	28.1	24.5	27.2	53.9	29.2	0		1 NW	4 Rs Rm Fm	18	
19	10.3	30.345	40.0	27.9	24.4	27.0	33.2	28.7	1	0.088	1 N	10 P; snowing	19	
20	—	—	—	—	—	—	—	—	—	—	—	—	20	
21	11.2	30.154	41.3	39.0	24.3	38.2	38.8	39.0	3 1/2	0.309	1 W.	0	21	8
22	10.0	30.438	42.6	38.9	30.4	38.1	42.1	39.0	0		0 SW	1 haze Rs Fm	22	
23	9.9	30.166	46.1	44.8	36.2	47.1	48.0	47.0	0		1 S	10 Rm	23	8
24	10.0	29.550	53.9	42.3	41.4	41.4	61.9	43.0	8 5/8	0.761	3 NW	0 Rs Fm	24	
25	10.5	30.036	37.2	28.8	19.1	28.0	43.0	29.6	0		2 SW	2 Rm Rs	25	
26	10.1	29.602	41.5	41.0	27.9	40.1	40.7	41.0	0 1/4	0.022	1 SE	10 Rm	26	
27	9.8	29.852	37.8	29.7	23.4	29.0	44.0	30.8	0		1 W	5 R Rs	27	
28	10.2	29.850	41.8	46.2	28.8	45.2	45.8	45.6	0 1/2	0.044	0 SE	10 P	28	
29	10.0	29.352	45.0	42.6	40.4	42.1	49.8	42.2	11 7/8	1.048	2 NW	10 Rm Fm	29	
30	9.7	30.065	40.0	33.1	26.8	32.5	44.0	33.5	0		1 W	5 Rm Rs Fm →	30	
	10.3	30.033 29.958	41.6	41.0	31.8	40.2	47.9		32 1/4	2.846	42 1.4	139 4.8		

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November 1884.

Date	Time P.M.	Barometer	Attached thermometer	No. 4	Wind	Clouds	Zodiacal Light	Aurora	Abstract
1									Obsc.
2	7.9	30.158	52.9	41.9	1 W	0 Rs	Moonlight	Suspected	Aurora
3	8.3	30.386	51.6	39.6	1 SW	1 PRs	Moonlight	Moonlight	None
4									Obsc.
5									None
6	9.9	30.070	42.0	26.3	1 W	0 Rs	Moonlight	Moonlight	None
7	8.0	29.840	48.5	41.4	2 SW	4 Pm Fm	Cloudy	Cloudy	None
8	8.8	30.215	45.0	30.3	2 NW	0	None	None	None
9	8.3	30.289	47.5	33.9	1 S	0	Visible	Low arch	Aurora
10	7.9	30.150	51.9	44.0	1 SE	0 haze	Visible	None	None
11	8.1	29.974	56.1	48.9	1 SW	1 haze	Visible	None	None
12	8.4	30.072	52.0	40.8	1 W	1 Rs haze	Visible	None	None
13	7.8	29.794	51.9	46.6	1 W	10 Pm Fm	Cloudy	Cloudy	None
14	8.5	29.950	50.6	40.9	1 W	0	Suspected	None	None
15	8.2	30.171	50.9	40.2	1 SW	0	Visible	None	None
16	7.7	29.930	52.5	43.0	0 calm	1 PRs haze	Hazy	Hazy	None
17	8.2	29.740	53.1	45.5	0 E	0 haze	Visible	None	Aurora
18									Obsc.
19									Obsc.
20	8.1	29.987	40.8	32.9	1 W	0 haze	Visible	None	None
21	8.3	30.302	46.0	37.8	0 SW	1 haze	Visible	None	None
22	8.6	30.400	47.9	41.3	0 calm	1 haze	Hazy	Hazy	None
23	8.1	29.688	51.8	61.3	5 S	10 Pm	Cloudy	Cloudy	Obsc.
24	8.4	29.816	40.9	27.9	2 NW	0	Moonlight	Moonlight	None
25									Obsc.
26	8.4	29.653	42.4	32.6	2 W	1 Pm Fm	Moonlight	Moonlight	None
27									Obsc.
28									Obsc.
29	8.0	29.908	42.2	32.6	1 S	0	Moonlight	Moonlight	None
30									Obsc.

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November, 1884.

3, 10.1 P.M. Day and evening cloudy; partly clear for a time about 6 P.M.
9.1 P.M. Day cloudy, evening clear at first, cloudy later. Fine auroral streamers for a time about 6½ P.M.
4, 9.8 A.M. Yesterday mostly clear; clouds after 9 P.M.; no aurora seen.
5, 10.4 A.M. Yesterday cloudy with a little rain; more rain in the evening.
6, 10.3 A.M. Yesterday mostly cloudy and rather warm; clear at times in the evening, with numerous passing clouds; no aurora seen.
6, 9.9 P.M. Day and evening clear and rather cold; no aurora seen; zodiacal light visible at 7 P.M.
8, 10.7 P.M. Yesterday mostly clear with clouds after 8 P.M.; no aurora seen. Today clear and rather cold; no aurora seen; zodiacal light suspected at 7¼ P.M.
9, 11.1 P.M. Day and evening clear and cool; aurora noticed at 8.3 P.M. not now visible.
10, 11.2 P.M. Day rather clear and cool; evening hazy; no aurora seen.
11, 11.4 P.M. Day and evening mostly clear and rather warm; no aurora seen.
12, 10.5 P.M. Day and evening rather clear and cool; no aurora seen; haze in the evening and some clouds at present.
14, 10.8 P.M. Yesterday rather cloudy; evening partly clear; no aurora seen. Today clear and cool most of the day; evening clear; no aurora seen.
15, 11.3 P.M. Day and evening clear and cool; no aurora seen.
17, 10.0 A.M. Yesterday rather clear; haze and thin clouds in the evening; no aurora seen.
17, 11.1 P.M. Day somewhat cloudy and rather warm; evening clear; low auroral arch now visible.
19, 10.3 A.M. Yesterday rather clear and cold; evening cloudy.
20, 10.3 P.M. Day cloudy and cool, mostly clear after 6 P.M. with clouds for a time about 8½ P.M.; no aurora seen.

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November, 1884.

21, 10.7 P.M. Day clear and cool; evening somewhat hazy; no aurora seen.

23, 9.9 A.M. Yesterday rather clear and warm; evening partly clear with frequent clouds; no aurora seen.

24, 10.0 A.M. Yesterday cloudy and warm day and evening, with high wind and some rain.

24, 11.1 P.M. Day and evening clear and cold; no aurora seen.

26, 10.1 A.M. Yesterday rather cold, becoming cloudy towards night.

26, 10.7 P.M. Day cloudy; clear for a time about 6 P.M. and after 8 P.M.; no aurora seen.

28, 10.2 A.M. Yesterday rather clear at first, cloudy later; evening cloudy.

29, 10.0 A.M. Yesterday cloudy day and evening, with rain.

29, 10.0 P.M. Day cloudy at first, then clear; evening clear, with thin clouds after about 9½ P.M.; no aurora seen.

Dec. 1, 11.2 P.M. Yesterday mostly cloudy; evening cloudy.

Aurora

Report to Signal Service, sent Dec. 3, 1884.
Looked for every clear evening; results as follows:
Nov. 2, Fine auroral streamers for a time about 6½ P.M.; aurora still suspected about 8 P.M.
Nov. 9. Low auroral arch at about 8¼ P.M., not visible about 11 P.M.
Nov. 17. Low auroral arch visible about 11 P.M.

Zodiacal light

visible on the evenings of Nov. 6, 9, 10, 11, 12, 15, 17, 20, 21; suspected Nov. 8, 14; observations on other evenings hindered by moonlight & clouds.

Report to New England Meteorological Society sent Dec. 1, 1884, to Prof. W. Upton, Providence, R.I., with max. and min. thermometer readings for November, 1884; also rainfall, and notes on instruments. A further report made Dec. 6 1884, for copy of which see p. 143.

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December 1884.

Date	Hour A.M.	Barometer	Attached thermometer	No. 4	Minimum before and after setting	Maximum before and after setting	Gauge	Rainfall in inches	Wind	Clouds	Date
1	9.8	30.070	40.0	34.6	29.0	34.0	39.3	35.0	0		2N	2PRs	1
2	10.0	30.148	36.7	28.4	21.8	27.9	39.1	29.0	0		2N	0P	2
3	10.0	29.797	35.6	27.6	20.2	27.0	33.3	28.4	0		1NW	4Rm Rs 7m /	3
4	10.1	30.017	39.6	38.3	26.9	37.8	40.1	38.4	0		1SW	5PRs 7m →	4
5	10.1	30.113	45.2	42.4	34.3	41.7	46.4	42.9	0		1SW	1 7m	5
6	10.4	30.200	44.2	38.1	32.1	37.2	52.0	38.0	0		0 calm	10P fog	6
7	10.2	29.464	50.1	see p. 150	37.1	54.2	57.5	54.2	15 1/4	1.346 ~~1.324~~	3SW	5M 7m →	7
8	10.0	29.626	52.1	46.0	44.6	45.1	57.0	46.3	0		4W	5Rm Rs 7m →	8
9	10.6	29.807	46.3	42.3	34.6	41.4	46.5	42.5	0		2W	9Rm Rs 7m →	9
10	10.4	30.137	42.6	29.7	25.8	29.0	43.9	30.8	0		2NW	9Rm 7m →	10
11	10.3	29.968	42.0	35.7	28.8	34.6	35.3	35.8	see p. 150	0.165	0 S	10R; snowing	11
12	10.2	30.040	42.0	34.7	32.8	34.1	37.2	35.2	see p. 150	0.022	0SW	10R; snowing	12
13	10.2	30.187	38.7	27.3	26.5	26.5	35.6	28.3	see p. 150		2N	10R; snowing	13
14	10.0	30.446	38.9	26.5	24.2	25.6	29.6	27.4	0 7/8	0.077	1N	10R 7m	14
15	10.2	29.479	42.0	52.5	25.6	51.7	52.0	49.5	9 1/4	0.816	1SW	10P 7m /	15
16	10.5	29.962	44.0	38.0	33.0	37.4	52.7	39.0	0		1W	0 7m	16
17	10.2	29.887	39.8	33.1	30.1	32.3	40.0	33.5	see p. 151		1S	10R; snowing	17
18	10.2	29.988	35.0	19.9	16.1	19.0	36.5	21.8	see p. 151	0.220	2NW	10R	18
19	10.2	30.061	21.0	4.0	2.5	3.7	22.0	7.2	0		2N	0	19
20	10.6	30.454	out of use 10.0	-4.9	-12.9	-5.3	7.2	-1.0	0		2NW	0	20
21	10.3	30.179	17.2	13.9	-5.2	13.3	14.3	15.0	see p. 151		1N	10R; a little snow	21
22	10.2	29.752	37.9	41.8	13.2	40.9	49.8	41.7	see p. 151	1.269	2SW	10Rm	22
23	11.0	30.002	33.8	24.7	23.9	24.0	49.8	25.8	1 3/8	0.121	4NW	3Rs 7m	23
24	10.6	30.320	27.4	14.4	12.9	13.5	25.8	16.0	see p. 151		2N	10R; snowing	24
25	11.2	30.180	27.8	18.6	13.0	18.0	22.3	19.3	see p. 151	0.803	3NW	1Rs 7m	25
26	10.5	30.576	20.9	12.5	9.3	11.6	19.7	13.6	0 1/4	0.022	2N	0 haze	26
27	10.2	30.618	19.9	15.2	8.8	14.4	16.9	16.3	0		2N	10R	27
28	10.8	30.475	28.0	31.3	14.4	30.2	30.8	30.8	0 1/4	0.022	0 calm	10P fog	28
29	10.0	30.415	34.1	39.2	30.0	38.2	38.6	38.4	0		1 S	9Rm RsRm 7m	29
30	10.3	30.289	40.1	47.3	38.0	46.2	46.8	46.2	0		1SW	1PRs	30
31	10.9	29.915	44.8	54.0	44.0	52.7	55.2	52.3	0		2SW	10Rm 7m / 7m //	31
	10.3	30.084	2602 / 36.1	1877 / 29.4	3021 / 23.1	715.4 / 7.9 / 30.3	1173.2 / 37.8		see p. 150, 151	~~4.867~~ 4.883	50	1.6	194	6.3

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December 1884.

Date	Time P.M.	Barometer	Attached thermometer	No. 4	Wind	Clouds	Zodiacal light	Aurora	Abstract
1	8.0	30.102	42.0	30.8	0 calm	1 P haze	Moonlight	Moonlight	None
2	8.0	30.071	39.7	27.6	0 calm	0 Pm 7m	Moonlight	Moonlight	None
3	8.2	29.682	40.6		0 W	0	Moonlight	Moonlight	None
4	7.8	30.062	47.1	38.0	0 S	5 P Rs 7m	Cloudy	Moonlight and clouds	None
5	8.0	30.137	50.1	44.7	1 S	0 Rs haze	Visible	None	None
6									Obsc.
7	8.1	29.432	53.4	Sea 150	2 SW	3 Pm 7m haze	Visible; some haze	None; some clouds	None
8	8.4	29.727	46.7	42.5	4 W	1 Pm 7m	Cloudy	None	None
9	8.1	29.790	47.7	35.7	1 W	4 Pm 7m	Cloudy	Cloudy	None
10	10.8	30.059	42.0	31.8	1 S	10 P	Cloudy	Cloudy	Obsc.
11	8.2	29.963	43.5	37.4	1 SW	0 haze	Visible	None	None
12									Obsc.
13									Obsc.
14									Obsc.
15	8.2	29.593	47.3	40.8	2 W	0 P	Visible	None	None
16	8.6	29.886	38.0	33.1	2 SE	1 P Rs haze	Visible	None; some clouds	Aurora
17									Obsc.
18									Obsc.
19	8.6	30.243	18.8	−7.0	2 NW	0	Visible	None	Suspected
20	8.6	30.524	17.0	−1.5	1 NW	0	Visible	Slightly suspected	Suspected
21	9.2	29.799	25.9	34.0	0 N	10 Rm; raining	Cloudy	Cloudy	Obsc.
22									Obsc.
23	8.1	30.286	26.0	19.4	1 SW	1 Rs haze	Moonlight and haze	Moonlight	None
24									Obsc.
25									Obsc.
26									Obsc.
27									Obsc.
28									Obsc.
29	8.5	30.300	42.2	43.8	1 S	9 Pm 7m	Cloudy	Cloudy	Obsc.
30	7.9	30.149	47.6	46.8	1 SW	1 P Rs	Moonlight	Moonlight	Suspected
31									Obsc.

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December 1884

1, 11.2 P.M. Day rather clear and cool; evening rather cloudy at first; mostly clear; no aurora seen.

2, 11.4 P.M. Day and evening mostly clear and cool; no aurora seen.

4, 10.0 P.M. Yesterday and today mostly clear and cool; evenings clear at first, thin clouds later; no aurora seen either evening.

5, 11.8 P.M. Day and evening clear and rather warm; no aurora seen.

7, 10.2 A.M. Yesterday cloudy day and evening with rain in the afternoon and night following; cleared off about 5½ A.M. today. No.4 not in place; probably in use by W.A. Rogers.

7, 10.0 P.M. Day very warm with some clouds; evening warm and partly clear; clouds frequent; no aurora seen.

8, 11.5 P.M. Day rather cool, cloudy, and windy; evening partly clear; many passing clouds after 10½ P.M.; no aurora seen; Zodiacal light visible about 7 P.M.

9, 11.4 P.M. Day mostly cloudy and cool; evening cloudy early and late, mostly clear 7 to 11 P.M.; no aurora seen.

10, 10.8 P.M. Day partly cloudy and cool; evening mostly cloudy.

11, 10.3 A.M. Snow about 2½ inches deep, still falling. No.4 put into snow and water.

11, 10.6 A.M. No.4 in snow and water 32.3

11, 3.3 P.M. Gauge 1⅛ ounces (water); 0.165 inches; No.4, 33.0, the bulb being now surrounded only by water, with snow higher in the glass.

11, 11.2 P.M. Day cloudy, with snow in the forenoon; evening partly clear, with haze and thin clouds at times; no aurora seen.

12, 10.2 A.M. Very little new snow up to this time.

12, 5.2 P.M. Day cloudy with a few snowflakes at times. Gauge now 0½ ounces (water); 0.022 inches.

13, 10.2 A.M. About half an inch of new snow at present.

14, 10.0 A.M. Yesterday cloudy day and evening, with a little snow. Contents of gauge partly frozen.

15, 10.2 A.M. Yesterday cloudy day and evening; following night rainy.

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16, 10.8 A.M. Aurora slightly suspected about 3 A.M.; arch seen by Professor Pickering about 1 A.M.

16, 11.3 P.M. Day and evening mostly clear; some clouds especially early in the evening; no aurora seen.

17, 10.2 A.M. A little snow on the ground; snow partly melts as it falls.

17, 5 P.M. Snow falling slowly through the day; gauge now 1½ ounces (water in gauge and snow in funnel); 0.132 inches.

18, 10.2 A.M. Yesterday evening cloudy; gauge now 1 ounce (ice in gauge and snow in funnel); 0.088 inches; snow on ground 2½ inches deep, light; as it fell with little or no wind, the total result by the gauge, 0.220 inches, is adopted.

19, 11.2 P.M. Yesterday cloudy and rather cold. Today clear and cold; aurora now slightly suspected; No. 4 — 8.8.

20, 9.7 P.M. Day clear and cold; thin clouds now gathering. Aurora slightly suspected at 8.6 P.M.; suspicion not confirmed.

21, 10.3 A.M. About half an inch of light snow on the ground.

22, 9.2 P.M. Day cloudy with snow and afterwards rain; gauge now 6 5/8 ounces (water in gauge and snow in funnel); 0.585 inches.

22, 10.2 A.M. Strong wind apparently from the southeast late yesterday evening, with rain. Gauge now 7¾ ounces; 0.684 inches; total rainfall 1.269 inches.

23, 11.0 A.M. Yesterday cloudy with a little rain; clearing off at 3½ P.M. today.

23, 8.1 P.M. Contents of gauge this morning were partly frozen. Lunar halo about 6½ P.M.

24, 10.6 A.M. Yesterday evening partly clear with thin clouds; no aurora seen; snow now on ground about 2 inches deep, light.

25, 12 M. Yesterday cloudy and rather cold with light snow much of the day. Snow at 11 A.M. today measured in six places 4 inches in one place 5 inches, in three places 5½

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December, 1884.

inches; mean 4,55 inches; 19½ inches of this snow in cylinder $1\frac{13}{16}$ inches across weigh $5\frac{1}{8}$ ounces; 9.82714 9.24679 8.70496 6.65801 0.70069 9.90480
hence rainfall to 1 inche of snow 0.1765 inches; total rainfall 0.803 inches. Gauge $1\frac{3}{4}$ ounces, (snow in funnel, a little in in bottle); 0,154 inches; result by measurement prefered, as the snow was accompanied by some wind.

26, 10.5 A.M. Yesterday mostly rather clear and cold; evening cloudy. A little snow early today.

27, 10.2 A.M. Yesterday mostly cloudy with a few snowflakes; evening cloudy.

28, 10.8 A.M. Yesterday cloudy day and evening.

29, 10.0 A.M. Yesterday cloudy day and evening.

30, 10.3 A.M. Yesterday warm and rather clear; thin clouds most of the evening.

30, 10.4 P.M. Day and evening warm and mostly clear; more clouds at 10 P.M.; aurora slightly suspected about 8½ P.M.

31, 10.9 A.M. ~~Yesterday~~ Rather clear part of the previous night; clouds came on from the southwest at 4 A.M.

Jan. 1, 1885, 10.1 A.M. Yesterday warm and mostly cloudy day and evening.

Report to Signal Service, sent Jan. 3, 1885.

Aurora looked for every clear evening; suspected Dec. 16, 3 A.M.; Dec. 19, 11 P.M.; Dec. 20, 8½ P.M.; Dec. 30, 8½ P.M.

Zodiacal light visible on the evenings of Dec. 5, 7, 8, 11, 15, 16, 19, 20; observations on other evenings hindered by moonlight or clouds.

Lunar halo noticed Dec. 23, about 6½ P.M.

Report to New England Meteorological Society sent Jan. 1, 1885, to Prof. W. Upton, Providence, R.I., with max. and min. thermometer readings for December, 1884; also rainfall.

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Report to Signal Service, sent Feb. 3, 1885.

Aurora — looked for every clear evening; on the evening of Jan. 8 light, perhaps auroral, between clouds in the north.

Zodiacal light — visible Jan. 8, 10, 12, 14, 17, 18; observations on other evenings hindered by moonlight or clouds.

Parhelia — seen Jan. 29, 8 A.M.

Lunar halo — Jan. 27, about 6 P.M.

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General remarks on observations for 1884.

Range of barometer and of temperature

The highest and lowest (uncorrected) reading of the barometer for each month, with the corresponding reading of the attached thermometer, are given below. As the barometer was usually read only once or twice each day, these readings may differ considerably from the actual maxima and minima for the successive months. The highest reading, for each month, of the maximum thermometer (Casella 13399), and the lowest reading of the minimum thermometer (Green 2205), both uncorrected, are also given below. The times are given in hours and tenths.

	Barometer								Temperature			
	Maxima.				Minima.				Max.		Min.	
	Date	Time	Barom.	Attached therm.	Date	Time	Barom.	Attached therm.	Date	C.13399	Date	G.2205
January	27	10.0 A.M.	30.700	21.5	2	9.3 P.M.	29.142	36.0	10	46.2	6	−3.3
February	16	10.2 A.M.	30.700	29.8	28	7.3 P.M.	28.999	35.9	15	55.8	29	3.6
March	11	10.1 A.M.	30.328	31.0	27	9.9 A.M.	29.431	45.2	25	56.2	5	2.8
April	27	8.6 P.M.	30.152	52.3	3	11.1 A.M.	28.861	37.2	17	68.0	1	26.1
May	31	8.8 P.M.	30.293	59.2	10	9.9 A.M.	29.494	54.0	20	78.2	30	35.0
June	15	9.4 A.M.	30.549	57.2	9	9.0 P.M.	29.784	74.5	22	90.0	15	40.5
July	4	10.2 A.M.	30.119	72.2	13	9.2 P.M.	29.592	72.8	3	88.0	16	52.3
August	25	9.5 A.M.	30.328	62.7	31	9.4 A.M.	29.798	72.0	19	86.7	25	48.2
September	14	11.4 A.M.	30.428	58.6	17	8.1 P.M.	29.764	72.2	11	87.9	14	39.1
October	26	9.9 A.M.	30.497	44.6	17	10.5 A.M.	29.632	56.8	2	79.2	16	30.3
November	22	10.0 A.M.	30.438	42.6	29	10.0 A.M.	29.352	45.0	24	61.9	25	19.1
December	27	10.2 A.M.	30.648	19.9	7	8.1 P.M.	29.432	53.4	7	57.5	20	−12.9

Range of barometer 30.700 Jan. 27 and Feb. 16 to 28.861 April 27.
" " temperature 90.0 June 22 to −12.9 December 20.

Observers

A. Searle usually; O. C. Wendell July 3, 8.6 P.M. to July 7, 8.9 A.M. inclusive; July 9, 7.6 P.M. to July 11, 9.2 A.M. inclusive; July 13, 10.7 A.M. to July 14, 9.2 A.M. inclusive; September 13, 9.8 A.M. to September 4, 8.8 P.M. inclusive.

Times of observation

Observations usually made near 10 A.M. and occasionally at other times, especially on clear evenings; time recorded with each observation. In the evening observations entered on the second

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page of the record for each month, a single time of observation is given, which applies to all observations on the corresponding line, (instead of the three times entered in previous years as explained on pp. 83 and 84.) Observations of zodiacal light or aurora, made at other times than those given on the second page of the record for each month, appear in the notes following the record.

Manner of recording times. The times are ordinarily given in hours and tenths; thus 9.9 stands for nine hours and nine tenths. The time employed is "Eastern Time", 5h slow of Greenwich mean civil time.

Instruments. Barometer J. Newman, No. 68; external thermometer No. 4; maximum thermometer Casella 13399; minimum thermometer Green 2205; vane; rain gauge; all as described in book Q5, just before the record for 1878. See also references given in the general remarks on the observations of 1882, book R67, p. 216.

Thermometer No. 4. See remarks just mentioned. The freezing point of the instrument was observed to be 32.3 on March 15 and December 11.

Wind recorded as in 1880; see book R67, pp. 50, 51; also pencil memorandum on inside of cover of this book.

Clouds. Observations of clouds recorded on the system adopted at the beginning of 1877; see record for January and February of that year in book Q4; also book Q5, p. 4.

Reductions. See general remarks on observations of 1882, book R67, p. 216. The reductions for 1884 were made largely by Mr. C. L. Eaton.

Reports. The results reported monthly to the U. S. Signal Service are also recorded in this book; see book R67, p. 51. See also this book, foot of p. 90. The final column of the second page of the record of each month has been filled, as before, with an abstract of observations relating to aurora, although this abstract is not now called for by the Signal Service.

For monthly reports made to the New England Meteorological Society, see pp. 143, 147, 152.

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January 1885.

Date	Time P.M.	Barometer	Attached thermometer	No. 4	Minimum before and after setting	Maximum before and after setting	Gauge	Rainfall in inches	Wind	Clouds	Date
1	10.1	29.700	49.9	48.5	47.7 47.7	57.4 48.5	0 1/8	0.011	1 NW	10 Pm Fm N	1
2	10.3	30.164	32.0	13.4	11.8 12.7	48.9 16.1	0 1/8	0.011	3 N	0	2
3	10.1	30.719	23.0	7.6	0.1 7.0	16.3 11.0	0		1 S	0	3
4	10.1	30.401	28.6	25.7	7.0 24.9	26.0 26.3	0		1 SW	8 R Rs	4
5	10.4	30.000	32.9	34.5	23.9 34.0	34.4 34.6	0		1 SW	7 R Rs	5
6	9.8	29.731	37.1	39.0	34.0 38.1	43.2 38.9	6 7/8	0.607	2 E	10 Pm fog; raining	6
7	10.0	29.303	45.0	49.7	38.2 48.9	54.6 49.8	6	0.580	2 S	10 Pm Fm N	7
8	10.0	29.808	41.0	37.8	34.8 37.1	50.2 38.0	0		2 W	0 Fm	8
9	9.8	29.700	40.8	44.1	30.4 43.3	43.9 43.6	0		3 S	8 R Rs	9
10	10.0	29.788	39.7	28.4	28.0 28.0	51.7 29.1	0		4 W	1 P Fm	10
11	9.8	30.212	31.2	24.4	16.1 23.7	29.3 25.2	0		1 SW	10 R Rs	11
12	10.2	29.418	44.3	51.2	23.7 52.6	54.0 52.3	6 1/2	0.574	4 S	10 Pm Fm N; raining	12
13	10.4	30.226	39.9	32.0	lost 31.9	57.0 32.8	1 1/8	0.099	3 NW	4 Pm M Rs Fm →	13
14	9.7	30.610	31.2	18.3	12.6 17.7	33.0 20.1	0		0 SW	0	14
15	10.2	30.380	32.2	29.0	17.6 28.6	29.0 29.2	0		0 SE	10 R	15
16	10.2	30.099	37.4	29.1	27.0 28.6	32.7 29.9	See p. 158	0.552 ~~0.550~~	0 N	10 P; snowing	16
17	10.3	29.199	26.8	32.7	28.3 32.2	36.0 32.7	See p. 158	1.169	0 calm	10 P; a little rain	17
18	11.1	30.184	29.0	19.4	13.3 18.4	41.0 20.3	0		2 NW	0	18
19	10.5	30.300	27.3	14.7	9.6 13.9	24.0 16.2	0		2 W	1 Rs	19
20	10.2	30.258	25.7	13.7	6.4 13.0	18.9 15.2	0		1 W	0	20
21	10.5	29.705	29.0	31.2	13.1 30.5	31.0 31.0	0		3 S	9 P Fm	21
22	10.0	30.127	out of sight at 15.0	−1.4	−2.5 −2.0	34.2 2.0	0		3 NW	0	22
23	10.2	30.401	17.8	9.0	−2.8 8.4	9.8 10.2	0		0 SW	2 Rs	23
24	10.1	29.688	27.4	30.7	8.4 30.0	30.4 30.4	4	0.353	2 NE	10 P; raining	24
25	9.7	29.560	30.2	33.1	25.6 32.5	32.9 32.7	2	0.177	0 calm	10 P	25
26	10.3	29.386	33.2	29.8	27.0 28.2	38.0 29.2	0		1 W	0 P	26
27	10.1	30.057	23.1	8.1	5.3 7.7	31.2 10.6	0		2 W	0 M Fm →	27
28	9.9	29.507	22.8	8.9	6.1 8.2	24.9 10.3	See p. 159		2 N	10 P; a little snow	28
29	10.3	30.146	out of sight at 15.0	5.1	−4.8 4.5	10.5 7.7	See p. 159	0.768	2 W	0	29
30	10.1	30.204	18.0	11.9	0.7 10.8	13.0 12.6	0		1 W	10 R	30
31	9.9	30.146	22.9	17.6	9.6 17.1	24.2 18.6	0		0 calm	0	31
		30.187	194	1601	496.2	1382	1061.6		See p. 158, 159	4.854 Difference for rainfall for month	49 1.6	160 5.2	
	10.1	29.974	30.6	25.2	16.6	24.5	34.2						
	29.968												

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1883phaq.proj.1668C

January 1885.

Date	Time P.M.	Barometer	Attached Thermometer	No. 4	Wind	Clouds	Zodiacal light	Aurora	Abstract
1									Obsc.
2	11.2	30.550	26.1	5.5	1 N	0	Moonlight	Moonlight	None
3									Obsc.
4									Obsc.
5									Obsc.
6									Obsc.
7									Obsc.
8	8.2	29.930	43.3	33.3	1 E	3 P Fm haze	Visible	Light among clouds	Suspected
9	8.8	29.445	44.1	42.6	1 S	5 P haze	Cloudy	Cloudy	Obsc.
10	8.3	30.112	29.8	21.4	1 W	0	Visible	None	None
11									Obsc.
12	7.9	29.692	47.3	39.9	3 W	1 P Rs	Visible	None	None
13									Obsc.
14	8.6	30.512	30.0	23.0	1 SW	0	Visible	None	None
15									Obsc.
16									Obsc.
17	8.2	29.550	28.6	22.6	4 W	0	Visible	None	None
18	8.1	30.169	28.2	18.2	2 W	0	Visible	None	None
19	8.3	30.282	22.2	12.9	1 SW	4 haze	Hazy	None	None
20									None
21	8.0	29.654	25.0	16.9	2 NW	0	Moonlight	Moonlight	None
22	6.7	30.328	out of sight at 1.50	−0.2	2 N	0	Moonlight	Moonlight	None
23									Obsc.
24									Obsc.
25									Obsc.
26	8.1	29.520	23.4	14.3	2 W	0	Moonlight	Moonlight	None
27									Obsc.
28									None
29	8.1	30.209	out of sight at 1.50	5.8	1 W	0	Moonlight	Moonlight	None
30									Obsc.
31	8.7	30.065	25.5	18.0	1 N	1 P R Rs	Moonlight	Moonlight	None

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1883phae.proj.1668C

January, 1885

1, 10.3 A.M. Yesterday cloudy day and evening, cooler towards night.
2, 11.2 P.M. Day and evening cold and mostly clear; no aurora seen.
4, 10.1 A.M. Yesterday mostly clear; evening cloudy.
5, 10.4 A.M. Yesterday cloudy day and evening.
6, 9.8 A.M. Yesterday rather cloudy, clear at times; evening cloudy.
7, 10.0 A.M. Yesterday warm and cloudy day and evening, with some rain.
8, 10.0 A.M. Yesterday warm and cloudy day and evening.
9, 9.8 A.M. Yesterday warm and rather clear; extensive and frequent clouds, mostly thin, in the evening; light between clouds in the north, perhaps aurora
9, 10.2 P.M. Day and evening warm and mostly cloudy; partly clear at times.
10, 11.2 P.M. Day and evening clear and rather cold; no aurora seen.
12, 10.2 A.M. Yesterday cloudy, beginning warmer; following night rain.
12, 10.7 P.M. Day warm and cloudy, with rain; evening clear after about 7½ P.M.; no aurora seen.
14, 9.7 A.M. Yesterday rather cold and mostly clear; evening mostly cloudy.
14, 11.7 P.M. Day and evening clear and cool; no aurora seen.
15, 4.2 P.M. Snow beginning soon after 10 A.M.; rain after about 3 P.M.; no wind; snow about 2 inches deep. Gauge at 4 P.M. (snow) 3¼ ounces, ~~0.285~~ 0.287 inches.
16, 10.2 A.M. Yesterday evening cloudy; some rain. Gauge now 3 ounces (snow in funnel, water and ice in bottle); 0.265 inches. Total rainfall for last 24 hours ~~0.550~~ 0.552 inches. New snow about half an inch.
16, 5.8 P.M. Snow early, changing to sleet and afterwards to rain. Gauge about 5½ P.M. (snow in funnel, water in bottle) 4 ounces, 0.353 inches.
17, 10.3 A.M. Yesterday evening cloudy, with rain. Gauge now 9¼ ounces, 0.816 inches; (water in bottle, a little ice in funnel); total rainfall for last 24 hours 1.169 inches.
17, 11.5 A.M. No. 4 in snow and water (since 10.5 A.M.); reading 32.3
17, 11.9 P.M. Day ~~cloudy~~ first rainy, clear towards night; evening clear and windy; no aurora seen.

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January 1885.

18, 11.6 P.M. Day and evening mostly clear and cold; no aurora seen.

20, 10.2 A.M. Yesterday mostly clear and cold; thin clouds and haze after 8 P.M.; no aurora seen.

21, 11.1 P.M. Day cloudy at first, soon clear and cool; evening clear after 6 P.M., rather cold; no aurora seen.

23, 10.2 A.M. Yesterday clear and cold day and evening; no aurora seen.

24, 10.1 A.M. Yesterday rather clear, cloudy towards night; evening cloudy. Snow and sleet this morning, changing to rain. Perhaps 3 inches of new snow.

25, 9.7 A.M. Yesterday cloudy with rain till about noon; evening cloudy. Contents of gauge frozen.

26, 10.3 A.M. Yesterday cloudy day and evening.

26, 11.3 P.M. Some clouds and a few snowflakes in the forenoon; afternoon and evening clear; no aurora seen.

28, 9.9 A.M. Yesterday clear and cold; evening cloudy, with snow during the night and this morning. New snow fallen light, about 3 inches deep. Lunar halo yesterday about 6 P.M.

29, 10.3 A.M. Yesterday cloudy with snow, clearing off during the evening; clear about 10 P.M.; no aurora seen. Snow this morning measures 4, 3½, 4½, 5½, 6 inches; mean 4.70 inches, 19 inches in cylinder 1 13/16 inches across weighs 4 5/8 ounces; hence rainfall to 1 inch of snow 0.1635 inches; total rainfall 0.768 inches. Gauge cleaned out.

9.82714 9.21350
6.72125 0.67210
9.66511 9.88560

29, 11.2 P.M. Day and evening clear and cold; no aurora seen.

31, 10.6 P.M. Yesterday cloudy with a few snowflakes; evening cloudy. Today clear, thin clouds in the evening; no aurora seen. Parhelia seen by Professor Pickering Jan. 29, 8 A.M.

Bar. max. 3, 10 A.M. 30.719 23.0; min. 17, 10.3 A.M. 29.199 26.8; C. 13899 max. 1, 5.74; G. 2205 min. 29, −4.8

Usual report sent to New England Meteorological Society Feb. 2, 1885.

For report to Signal Service see p. 153.

1883phaq.proj.1668C
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1883phae.proj.1668C

February 1885.

Date	Time A.M.	Barometer	Attached thermometer	No 4	Minimum before and after setting	Maximum before and after setting	Gauge	Rainfall in inches	Wind	Clouds	Date
1	10.6	29.722	24.3	21.3	9.0 20.1	28.2 21.3	0		0 calm	10 P; snowing	1
2	11.1	29.801	out of sight est. 16.0	4.2	3.4 3.6	27.4 7.0	8 sq. ft. 16 2	0.375	4 NW	0	2
3	10.1	29.767	out of sight est. 14.0	4.4	−0.8 4.0	7.0 6.4	0		2 NW	0	3
4	10.4	29.576	20.7	20.3	3.9 19.2	20.1 20.2	0		0 NE	10 P	4
5	10.3	29.340	26.0	29.4	18.3 28.8	29.3 29.3	0 3/4	0.066	1 W	9 P 7m	5
6	10.5	29.630	25.3	19.2	15.6 18.2	35.4 20.0	0 1/8	0.011	2 NE	10 P	6
7	10.7	29.816	19.6	13.0	3.0 12.3	22.8 14.2	0		2 NW	0	7
8	11.1	29.846	21.2	15.9	6.5 15.0	20.0 16.8	5 sq. ft. 16 2		0 NW	10 P; snowing	8
9	10.6	30.035	23.2	26.1	12.3 25.2	26.0 26.0	1	0.088	1 NE	10 P	9
10	10.6	28.944	33.0	46.7	25.1 45.9	46.0 45.0	18 3/4	1.655	1 S	10 P mist	10
11	10.4	29.762	20.2	3.0	0.9 2.7	46.8 6.2	0 3/8	0.033	3 W	0 7m	11
12	11.0	30.186	17.7	8.0	−2.2 7.3	9.0 10.0	0		2 W	0 Rs	12
13	10.1	30.100	17.9	20.8	7.2 17.2	18.2 18.8	0		2 NW	1 Rs	13
14	10.1	30.054	22.8	17.5	13.1 16.8	25.1 18.2	0		2 NE	6 P 7m ←	14
15	10.5	30.010	23.0	21.0	12.0 20.2	23.0 21.0	0 1/4	0.022	2 N	0	15
16	10.3	30.041	30.2	33.0	20.0 32.3	32.9 32.9	0 1/8	0.011	3 E	10 P	16
17	10.2	29.639	27.7	9.7	8.9 9.1	40.3 13.3	10 1/4	0.905	2 W	0	17
18	10.3	29.823	20.3	11.4	4.7 10.3	14.0 12.6	5 sq. ft. 16 3		1 N	10 P; snowing	18
19	10.5	29.750	20.7	11.7	2.0 11.0	17.0 13.0	0 3/4	0.066	2 NW	0	19
20	10.5	29.696	21.0	13.2	2.9 12.6	17.3 15.0	0		2 W	0 R Rs	20
21	11.3	29.768	23.5	23.4	9.8 22.8	23.6 24.0	0		2 NW	0	21
22	10.0	29.938	23.8	19.8	11.1 19.0	27.2 20.9	0		2 NW	0	22
23	9.6	30.103	25.0	17.2	12.1 16.3	27.5 18.3	0		2 N	0	23
24	9.9	30.286	22.3	17.4	8.8 16.3	23.8 19.0	0		2 NW	0	24
25	10.5	30.022	29.2	27.2	16.4 26.7	30.3 27.0	0 3/8	0.033	1 NW	9 P	25
26	10.3	30.108	26.0	22.9	12.1 22.1	30.9 23.8	0		1 NW	0	26
27	10.5	29.900	31.9	32.7	22.2 31.9	32.2 32.2	0		2 N	10 P	27
28	10.5	29.984	32.8	33.0	22.5 32.3	34.7 33.0	0		1 N	7 P 7m Snow	28
	10.4	236.47 29.845 +.014 29.859	993 23.5	1234 24.4	280.8 10.0	23.82 16.5	736.0 26.3		3.265 Rainfall for month 3.26 inches	47 1.7	122 4.4	

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1883phae..proj..1668C

February 1885.

Date	Time P.M.	Barometer	Attached thermometer	No. 4	Wind	Clouds	Zodiacal light	Aurora	Abstract
1	9.8	29.596	27.5	20.4	3 SW	0	Moonlight	Moonlight	None
2	7.6	29.814	out of sight est. 15.0	1.7	1 W	0	Visible	None	None
3	8.1	29.750	out of sight est. 15.0	8.6	1 SW	0	Visible	None	None
4									Obsc.
5	9.0	29.550	30.3	25.0	1 NW	1 PR 7m	Visible	Arch	Aurora
6									Obsc.
7	7.5	29.911	20.3	12.8	1 NW	0	Visible	None	None
8	8.1	29.918	23.8	16.5	1 W	0 haze	Visible	None	None
9									Obsc.
10	7.6	29.202	34.0	17.2	3 W	0 7m	Visible	None	None
11	9.3	30.049	20.2	0.9	2 W	0	Visible	None	Aurora
12	6.7	30.047	20.2	14.0	1 S	0 haze	Visible	None	None
13									Obsc.
14									Obsc.
15									None
16									Obsc.
17	8.0	29.806	out of sight 16.0	5.5	2 W	0	Visible	None	None
18	7.6	29.787	19.9	11.4	1 N	0	Moonlight	Moonlight	None
19	8.5	29.727	19.4	10.7	1 W	0	Moonlight	Moonlight	None
20	7.3	29.662	25.9	13.8	1 W	0	Moonlight	Moonlight	None
21	8.7	29.870	27.5	20.4	1 SW	0	Moonlight	Arch suspected	Suspected
22									Obsc.
23	9.4	30.186	22.5	14.4	2 N.N.W.	0	Moonlight.	Moonlight.	None
24									Obsc.
25	10.8	30.044	30.3	19.2	1 N.	0	Moonlight.	Moonlight.	None
26									Obsc.
27									Obsc.
28	7.5	29.988	37.2	32.1	1 SW	3 Pi 7m haze	Cloudy	Moonlight	None

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1883phae.proj.1668C

February, 1883

1, 11.1 P.M. Day cloudy with snow, clearing off before 9 P.M.; no aurora seen.

2, 9.8 P.M. Day and early evening clear and cold; clouds and haze increasing after 9 P.M.; no aurora seen. The snow of yesterday could not be measured with certainty; by estimate 3 inches of snow, $0\frac{3}{8}$ inches rainfall.

3, 10.8 P.M. Day clear and cold; evening clear, becoming cloudy after 10 P.M.; no aurora seen.

5, 11.2 P.M. Yesterday cloudy day and evening, with a little sleet. Contents of gauge this morning partly frozen. Day cool and partly cloudy; evening clear after 9 P.M.; auroral arch rather bright at 9 P.M., now faint; sky rather dark below.

7, 10.7 A.M. Yesterday cloudy and cold, clear before 2 A.M. today.

7, 10.8 P.M. Day and evening clear and cold; no aurora seen.

8, 11.1 A.M. Snow this morning, amount as yet inconsiderable.

8, 11.7 P.M. Day cloudy with a little snow; evening mostly clear after 7 P.M., with some haze; no aurora seen.

10, 11.6 P.M. Day cloudy with some rain, clear towards night; evening clear and rather cold; no aurora seen. Yesterday cloudy day and evening; rain in the night; contents of gauge this morning partly frozen.

11, 11.1 P.M. Day clear and cold; contents of gauge frozen; evening clear and cold; aurora at present time; arch, partly double, with short streamers; sky dark below.

12, 11.7 P.M. Day and evening clear and rather cold; no aurora seen.

14, 10.1 A.M. Yesterday cloudy day and evening; a few snowflakes in the night.

15, 10.5 A.M. Yesterday cloudy day and evening; a little snow.

16, 10.3 A.M. Yesterday clear and cool, cloudy after 7 P.M.; no aurora seen.

17, 10.2 A.M. Yesterday cloudy and windy, with a little snow followed by rain.

17, 11.7 P.M. Day and evening clear and cold; no aurora seen, No Gegenschein now perceptible; but Jupiter near δ Leonis, Uranus & the region visible.

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1883phae.proj.1668C

February, 1885.

18, 10.3 A.M. Yesterday contents of gauge frozen. This morning, light snow; quantity as yet inconsiderable.

18, 11.5 P.M. Day at first cloudy with light snow; afternoon and evening clear and rather cold; no aurora seen.

19, 12.2 P.M. Snow and ice in gauge; result for rainfall probably too small, but amount cannot be determined with accuracy.

19, 11.1 P.M. Day and evening clear and cold; no aurora seen.

21, 1.5 A.M. Yesterday clear and cold day and evening; no aurora seen.

21, 11.1 P.M. Day and evening clear, rather cold; auroral arch suspected 8½ to 9 P.M.

23, 9.6 A.M. Yesterday at first clear; cloudy towards night with a few snowflakes.

24, 9.9 A.M. Yesterday clear and rather cold day and evening; no aurora seen.

25, 10.5 A.M. Yesterday clear at first; evening cloudy; a little snow early today.

26, 10.3 A.M. Yesterday cloudy at first, afterwards clear; no aurora seen.

27, 10.5 A.M. Yesterday clear at first, thawing; evening cloudy.

27, 2.0 P.M. No. 4 in snow and water at 11 A.M. read 32.3

28, 10.5 A.M. Yesterday mostly rather cloudy; evening cloudy.

28, 10.2 P.M. Day rather clear; evening cloudy at times; no aurora seen.

Bar. max. 24, 9.9 A.M. 30.286 22.3: min. 10, 10.6 A.M. 28.944 33.0; C. 1339, max. 11, 4.6.8; G. 2705 min. 12 −2.2
Obs. O.C.W. 23, 8.4 P.M.; 25, 10.8 P.M. Freezing point of No. 4, 32.3, 27, 11 A.M.

Report to Signal Service, sent March 3, 1885.

Aurora looked for every clear evening; results as follows:

Feb. 5. Auroral arch rather bright at 9 P.M., faint at 11 P.M.; sky rather dark below.

Feb. 11. Auroral arch at 11 P.M., partly double, with short streamers; sky dark below.

Feb. 21. Auroral arch suspected 8½ to 9 P.M.

Zodiacal light visible Feb. 2, 3, 5, 7, 8, 10, 11, 12, 17; observations on other evenings hindered by moonlight or clouds.

Usual report sent March 1, 1885, to N. E. Meteorological Society.

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1883phae.proj.1668C

March 1885

Date	Time P.M.	Barometer	Attached thermometer	No. 4	Minimum before and after setting		Maximum before and after setting		Gauge	Rainfall in inches	Wind	Clouds	Date
1	9.5	29.774	34.7	38.4	26.9	37.8	38.3	38.2	0		2 S	10 P 7m	1
2	10.1	29.358	38.2	39.7	34.2	39.1	48.0	40.0	2 3/4	0.243	2 W	1 M 7m →	2
3	10.4	29.798	34.0	29.0	22.3	28.4	41.7	30.0	0		1 NW	0	3
4	10.5	29.819	36.0	40.8	25.9	39.9	40.1	40.1	0		1 S	9 Pm 7m →	4
5	10.8	29.948	38.1	42.7	31.0	41.0	47.0	41.3	0		1 SW	10 Pm	5
6	10.2	30.102	34.1	29.1	23.0	28.3	43.2	29.9	0		2 N	5 Rs	6
7	10.4	29.978	33.4	29.7	20.6	29.0	35.1	30.0	0		2 NE	9 P 7m	7
8	9.6	29.863	33.0	25.1	21.9	24.2	33.0	26.1	0 1/8	0.011	2 N	10 P 7m	8
9	10.3	30.025	23.9	16.0	7.0	15.2	28.9	17.4	0		2 W	0	9
10	10.2	29.624	29.7	27.7	18.2	27.1	30.2	28.0	0		4 W	5 M 7m →	10
11	10.5	30.179	22.9	15.0	9.3	14.3	29.0	16.2	0		3 NW	0	11
12	10.0	29.946	27.0	27.9	14.2	26.9	27.6	27.9	0 5/8	0.055	1 NW	10 P 7m	12
13	10.1	30.219	19.2	15.1	0.4	14.3	29.0	16.1	0		2 N	10 P 7m ←	13
14	9.9	29.895	26.0	22.7	14.3	21.9	22.7	23.1	0 1/8	0.011	1 NW	8 Pm 7m →	14
15	10.0	29.746	31.6	38.5	17.4	37.7	38.0	38.0	0		2 S	10 Pm 7m	15
16	9.8	29.700	34.7	26.6	23.3	25.9	39.6	28.1	4 1/4	0.375	2 W	0	16
17	10.3	30.023	28.1	14.4	8.9	13.6	32.5	16.1	0 1/4	0.022	2 NW	0	17
18	9.4	29.982	22.0	11.7	3.2	11.1	22.7	14.0	0		1 NW	1 P Rs	18
19	10.4	29.522	23.8	20.9	10.2	20.1	23.0	21.7	0		2 W	0 P 7m	19
20	10.7	29.363	24.8	16.6	7.8	16.0	29.0	17.8	0		2 NW	0 7m	20
21	10.3	29.811	21.0	13.0	5.5	12.3	21.3	15.0	0		3 W	0 7m	21
22	10.3	30.099	21.0	16.7	5.6	15.8	18.5	17.5	0		1 NW	7 R Rs	22
23	10.2	29.958	23.5	19.9	12.2	19.1	24.0	22.0	0		2 N	0 Rs	23
24	10.8	30.169	24.6	24.1	9.8	23.5	26.0	24.2	0		1 W	0 Rs	24
25	10.3	29.970	32.4	32.7	23.3	32.0	34.3	33.0	0		3 NW	0 Pm 7m	25
26	10.2	30.156	30.1	31.7	17.9	31.1	34.4	32.0	0		1 SW	0 Rs	26
27	10.5	29.901	36.9	49.7	31.0	48.8	49.3	48.0	0		2 S	2 P Rs	27
28	10.0	29.771	42.1	47.6	40.3	47.0	53.9	47.3	0		2 NW	2 P Rs	28
29	10.1	29.993	37.6	27.3	25.6	26.4	49.3	28.0	see p. 167	0.593	3 NE	10 P, snowing	29
30	10.5	30.422	31.9	32.6	11.0	32.0	32.3	32.6	0		1 S	0	30
31	9.8	30.150	37.0	46.8	29.1	45.8	46.4	46.0	0 1/8	0.011	2 S	9 Pm Rs 7m	31
		28264	3.3	2492	548.3	2256	1068.3		see p. 167	1.321 Rainfall for month 1.32 in.	58	1.9 128 41	
	10.2	29.912	30.1	28.0	17.7	27.3	34.5						
	29.908												

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1883phae.proj.1668C

March 1885

Date	Hyg. C.M.	Barometer	Attached Thermometer	No. 4	Wind	Clouds	Zodiacal light	Aurora	Abstract
1									Obs.
2	8.3	29.577	38.0	30.8	2W	0	Moonlight	Moonlight	None
3	8.2	29.887	37.8	29.2	1W	2 Rs haze	Visible	None; thin clouds	None
4	7.2	29.899	42.5	39.0	1S	0	Visible	None	None
5	7.2	29.981	41.4	35.0	2NW	0 haze	Visible	None	None
6	7.3	30.102	39.2	30.7	0 calm	0 haze	Visible	None	None
7									Obs.
8	7.2	29.897	31.1	20.0	3NW	0 Fm	Visible	None	None
9									Obs.
10	7.0	29.916	29.9	21.5	2W	5 PrRs Fm	Visible	Cloudy	None
11									Obs.
12	8.6	30.167	23.0	7.2	2NE	0	Visible	None	None
13									Obs.
14	7.3	29.899	33.2	26.6	0 SW	0	Visible	None	None
15									Obs.
16									None
17									None
18	8.1	29.810	28.0	15.7	2NW	0 PRs	Visible	None	None
19	7.7	29.452	31.7	23.3	2SW	4 P haze	Moonlight and haze	Moonlight and haze	None
20	9.4	29.619	24.5	10.6	3W	0	Moonlight	Moonlight	Aurora
21	7.3	29.942	24.0	13.8	2W	0	Moonlight	Moonlight	None
22									Obs.
23	8.1	30.050	28.4	21.0	2NW	1 PRs	Moonlight	Moonlight	None
24									Obs.
25	7.2	30.074	33.3	27.1	1SW	0 PRs	Moonlight	Moonlight	None
26									Obs.
27									Obs.
28	7.1	29.901	46.0	40.2	1NW	3 PRs Fm	Moonlight	Moonlight	None
29	8.1	30.140	34.2	25.0	0 W	1 Rs Fm	Moonlight	Moonlight	None
30	7.9	30.409	37.3	30.2	2S	5 PrRs	Moonlight and clouds	Moonlight and clouds	None
31									Obs.

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March 1883.

1, 10.2 A.M. Yesterday cloudy and thawing, with rain in the evening.
2, 11.4 P.M. Day and evening mostly clear; no aurora seen; Zodiacal light visible before moon rose.
3, 9.6 P.M. Day rather clear, afternoon rather cloudy; thin clouds early in the evening, clearer afterwards; no aurora seen.
4, 10.6 P.M. Day rather cloudy at first; afternoon and evening clear; no aurora seen.
5, 10.7 P.M. Day cloudy early, clear later; evening clear; no aurora seen.
6, 10.0 P.M. Day mostly clear; evening rather clear, hazy increasing; no aurora seen.
8, 9.6 A.M. Yesterday mostly cloudy and chilly; a little snow early today.
8, 10.8 P.M. Day mostly cloudy, with a little snow, clear towards night; no aurora seen.
10, 10.2 A.M. Yesterday mostly clear; evening cloudy, with a few snowflakes.
10, 11.2 P.M. Day and evening mostly clear and rather cold; no aurora seen.
12, 10.0 A.M. Yesterday clear and rather cold, cloudy towards night; a little snow early today.
12, 11.2 P.M. Day cloudy at first, afterwards clear and cold; no aurora seen.
14, 9.9 A.M. Yesterday cloudy day and evening, with a little snow.
14, 10.9 P.M. Day and evening mostly clear and rather cold; no aurora seen.
16, 9.8 A.M. Yesterday cloudy day and evening, with rain.
17, 10.3 A.M. Yesterday mostly clear; thin clouds after 7 P.M.; no aurora seen. A little snow during the night.
18, 9.4 A.M. Yesterday mostly clear and cold day and evening; no aurora seen; Zodiacal light visible about 7½ P.M.
20, 12.3 A.M. Yesterday mostly clear and cold; evening hazy; no aurora seen.
20, 10.9 P.M. Day and evening cold and windy with clouds at times; faint auroral arch at present, sky dark below.
21, 10.8 P.M. Day and evening clear and cold; no aurora seen.
23, 10.2 A.M. Yesterday cloudy day and evening.
23, 11.9 P.M. Day rather cloudy; evening mostly clear and cold; no aurora seen.
24, 9.0 P.M. Day clear; thin clouds towards night; lunar halo about 7 P.M.
25, 10.0 P.M. Day clear and cool; thin clouds most of the evening; imperfect lunar halo about 9½ P.M.; no aurora seen.
26, 10.5 P.M. Day rather clear; evening rather cloudy.

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28, 10.0 A.M. Yesterday rather clear, cloudy towards night; evening cloudy.

29, 10.1 A.M. Yesterday mostly rather clear; cloudy after 8 P.M.; no aurora seen. Snow during the night, still continuing; about 5 inches deep, considerably drifted.

29, 12 M. Snow ceased about 11 A.M. Gauge cleared out. Snow measured in 5 places 5, 5, 4, 6, 4; mean 4.8 inches 9.82714 9.89154
17 inches in cylinder $1\frac{13}{16}$ inches across weigh $3\frac{1}{8}$ ounces 8.76955 0.08120
Hence rainfall of 1 inch of snow 0.1235 inches; total rainfall 0.593 inches. 0.24485 9.77278

29, 10.2 P.M. Mostly clear after 3 P.M.; no aurora seen.

31, 9.8 A.M. Yesterday mostly clear; thin clouds after 7 P.M.; more cloudy later; no aurora seen.

April 1, 10.0 A.M. Yesterday mostly cloudy and rather warm; evening cloudy with a little rain.

Barom. max. for March, 30, 10.5 A.M., 30.4122, att. therm. 31.9; min. 2, 10.1 A.M. 29.3588; att. therm. 38.2
C.13399, max. 28, 53.9; C.2205, min., 13, 0.4.

Report to Signal Service, sent April 1, 1885.

Aurora looked for every clear evening; results as follows:
March 20, Faint auroral arch about 11 P.M., sky dark below.

Zodiacal light visible March 2, 3, 4, 5, 6, 8, 10, 12, 14, 17, 18; observations on other evenings hindered by moonlight or clouds.

Lunar halos. March 24, about 7 P.M., and March 25, about 9½ P.M., the last imperfect.

Usual report sent to the New England Meteorological Society, April 1, 1885.

Mention of Gegenschein in Sidereal Messenger IV. 57. (March 1886). Feb. 6, between 10h and 11h, slightly over ⅓ of distance from Raesepe to Jupiter. Observer not given.

Also in Sidereal Messenger IV. 124 (May 1885.) Gegenschein March 19, midnight; pretty large, hazy, 3° northwest of γ Virginis. Observer, Barnard.

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April 1885.

Date	Time A.M.	Barometer	Attached thermometer	No.4	Minimum before and after setting		Maximum before and after setting		Gauge	Rainfall in inches	Wind	Clouds	Date
1	10.0	30.100	43.3	48.9	37.8	48.0	53.6	48.2	$0\frac{3}{8}$	0.033	1 SW	5 R Rs	1
2	10.4	30.358	40.1	34.2	30.7	33.5	56.0	34.4	0		0 calm	10 P; a little sleet	2
3	10.4	29.871	45.0	61.0	33.3	59.3	60.0	58.0	0		2 SW	5 Rs M Fm	3
4	10.5	29.576	41.7	37.2	33.9	36.3	66.0	37.3	{see 1/170}		2 NE	10 P; raining	4
5	10.3	29.616	40.7	40.3	32.0	39.7	39.8	40.0	$12\frac{1}{2}$	1.103	2 W	0 M Fm	5
6	10.4	29.579	44.3	46.0	36.3	45.1	49.0	46.0	$0\frac{1}{4}$	0.022	3 W	9 M Fm	6
7	10.4	30.230	41.0	44.9	32.1	44.1	46.9	44.9	0		1 W	0 Rs	7
8	10.5	29.790	45.4	49.3	38.3	48.2	53.0	48.9	$2\frac{1}{2}$	0.221	1 S	10 P	8
9	10.1	29.943	35.9	28.5	26.5	28.0	63.1	29.8	0		3 NW	0	9
10	10.1	30.045	38.0	35.9	25.9	35.1	36.1	35.7	0		2 NE	9 P Rs	10
11	10.0	29.767	39.0	38.7	28.4	38.0	39.2	38.9	0		1 NE	0 Fm	11
12	9.7	29.709	40.4	41.6	30.1	40.4	44.7	41.0	0		0 S	10 Pm	12
13	9.8	29.707	41.3	41.2	33.2	40.2	41.1	41.0	$1\frac{1}{4}$	0.110	1 SW	10 Pm Fm	13
14	10.4	29.894	41.6	44.0	34.0	43.1	45.6	43.8	$0\frac{3}{4}$	0.066	3 NW	10 Pm M Fm	14
15	10.0	29.943	41.1	43.1	29.0	42.6	50.0	43.5	0		1 SW	0 Rs	15
16	10.4	29.818	43.6	44.9	34.0	44.1	51.6	45.0	0		2 W	0	16
17	8.8	30.051	41.0	45.7	33.0	45.0	49.8	45.4	0		2 NW	7 Fm Rs	17
18	10.3	30.358	44.0	48.3	34.4	47.8	52.1	48.3	0		1 NE	0	18
19	10.2	30.188	45.1	52.9	35.3	52.1	52.3	52.2	0		1 NW	0	19
20	10.3	30.414	49.0	62.0	38.1	61.2	61.0	60.4	0		2 SW	0	20
21	10.3	30.190	55.6	70.7	51.7	69.3	72.0	69.0	0		1 SW	2 Rs Fm	21
22	10.0	30.194	58.2	69.3	53.8	68.3	78.3	68.0	0		2 E	0 Fm	22
23	10.4	30.226	56.4	66.9	43.3	65.9	70.5	65.0	0		1 S	1 haze	23
24	10.0	29.975	57.0	68.1	49.2	67.1	75.0	66.1	0		1 S	0 haze	24
25	10.4	30.004	60.2	62.3	57.0	61.4	73.3	61.8	$0\frac{1}{8}$	0.011	2 N	0	25
26	9.7	30.160	52.9	44.7	40.7	44.0	66.7	45.1	0		2 E	10 Pm Fm Fm	26
27	9.9	29.855	49.5	53.2	36.4	52.8	53.2	53.2	$11\frac{1}{4}$	0.993	3 W	0 Fm	27
28	10.4	29.905	52.9	53.0	39.3	52.1	63.0	52.6	0		1 NW	3 P Rs Fm	28
29	9.8	29.237	51.7	41.9	41.2	41.2	58.5	42.0	$7\frac{3}{4}$	0.684	5 N	10 Pm	29
30	9.9	29.614	48.9	54.9	40.7	54.1	57.6	54.7	$3\frac{5}{8}$	0.320	2 NW	0	30
	10.1	29.957	184.8	2736	1109.6	2480	1680.0		$40\frac{3}{8}$	3.563	51	121	
		29.909	46.2	49.1	37.0	48.3	56.0			Rainfall for month 3.56 inches	1.7	4.0	

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April 1885

Date	Time P.M.	Barometer	Attached thermometer	No. 4	Wind	Clouds	Zodiacal light	Aurora	Abstract
1	8.3	30.197	49.2	43.9	2 NW	0 P haze	Visible	None	None
2									Obsc.
3									Obsc.
4									Obsc.
5									Obsc.
6	8.5	29.507	43.3	37.3	1 W	0	Visible	None	None
7									Obsc.
8									Obsc.
9	8.4	29.986	37.7	30.4	1 NW	1 PRs	Cloudy	None; some clouds	None
10	8.1	29.945	43.0	31.9	0 calm	0 PRs	Visible	None	None
11									Obsc.
12									Obsc.
13									Obsc.
14	8.4	30.009	45.7	40.0	2 SW	0	Visible	None	Aurora
15									Obsc.
16	8.4	29.946	46.4	41.1	2 NW	0	Visible	None	None
17	8.0	30.133	49.0	46.2	2 NW	0	Moonlight	Moonlight	None
18	8.0	30.432	49.9	42.1	0 S	0	Moonlight	Moonlight	None
19	8.4	30.466	54.3	49.9	0 calm	0	Moonlight	Moonlight	None
20	8.0	30.299	59.4		0 SW	0	Moonlight	Moonlight	None
21									Obsc.
22	7.9	30.228	60.4	50.7	1 NE	0 haze	Moonlight	Moonlight	None
23	8.1	30.139	62.6	57.7	2 SW	1 haze	Moonlight	Moonlight	None
24	8.3	29.911	65.1	60.3	2 S	5 P Fm haze	Moonlight and clouds	Moonlight & clouds	Obsc.
25	8.1	30.139	62.8	51.4	0 calm	0	Moonlight	Moonlight	None
26									Obsc.
27	8.2	29.888	58.7	55.4	3 W	0 P	Moonlight	Moonlight	None
28									Obsc.
29									Obsc.
30	8.3	29.690	58.0	54.9	1 NW	0 P	Visible	None	None

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April, 1885.

1, 10.2 P.M. Day rather warm and clear; evening mostly clear; thin clouds at present, especially in the north; no aurora seen.

3, 10.4 A.M. Yesterday cloudy and chilly day and evening.

4, 10.5 A.M. Yesterday rather cloudy, somewhat clear about sunset, cloudy later, with rain. Probably about $\frac{1}{10}$ of an inch of rain upto the present time. ~~Gauge not~~ Bottle not removed from gauge.

5, 10.3 A.M. Yesterday cloudy day and evening with rain, ending with a little snow.

6, 10.4 A.M. Yesterday clear and rather warm; evening cloudy; a little rain.

6, 11.0 P.M. Day cloudy and windy, evening clear; no aurora seen.

8, 10.5 A.M. Yesterday clear, becoming cloudy; evening cloudy with a little rain.

9, 10.1 A.M. Yesterday cloudy day and evening.

9, 9.9 P.M. Day clear and rather cold; evening clear at first, with thin variable clouds later; no aurora seen.

10, 10.3 P.M. Day mostly cloudy; evening mostly clear between 7 and 9 $\frac{1}{2}$ P.M.; cloudy before and later; no aurora seen.

12, 9.7 A.M. Yesterday clear at first, cloudy towards night and in the evening.

13, 9.8 A.M. Yesterday cloudy and chilly, with a little snow and rain; evening cloudy.

14, 10.4 A.M. Yesterday cloudy with a little rain; evening cloudy.

14, 11.4 P.M. Day mostly cloudy with a little rain; evening clear; low auroral arch 10 $\frac{1}{2}$ P.M. and later; sky dark below.

16, 10.4 A.M. Yesterday mostly clear; evening cloudy.

16, 11.7 P.M. Day and evening clear; no aurora seen.

17, 11.4 P.M. Day and evening mostly clear; no aurora seen.

18, 11.3 P.M. Day and evening clear; no aurora seen.

19, 11.2 P.M. Day and evening clear; no aurora seen.

20, 11.8 P.M. Day and evening clear and warm; no aurora seen.

22, 10.0 A.M. Yesterday rather hot and clear, cloudy later; evening cloudy.

22, 11.3 P.M. Day and evening warm and rather clear; no aurora seen.

23, 11.3 P.M. Day and evening clear and rather warm; no aurora seen.

25, 10.4 A.M. Yesterday warm and rather clear; evening rather cloudy.

25, 11.0 P.M. Day and evening clear, rather warm; some thin clouds and faint lunar halo at present.

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April 1885.

28, 9.9 A.M. Yesterday cloudy and chilly day and evening, with rain.
27, 11.0 P.M. Day and evening clear; no aurora seen.
29, 9.8 A.M. Yesterday cloudy most of the day and in the evening, with rain,
30, 9.9 A.M. Yesterday cloudy and windy day and evening, with rain.
30, 11.3 P.M. Day mostly clear and rather warm; evening clear at first, then clouds after 8½ P.M.; no aurora seen.

Bar. max. 19, 10.2 A.M., 30.488, 45.1; min. 29, 8.8 A.M., 29.237, 51.7; C. 13399, max., 22, 78.3; C. 2205, min., 10, 25.9.

Report to Signal Service, sent May 1, 1885.

Aurora looked for every clear evening; results as follows:
April 14, Low auroral arch 10½ P.M. and later; sky dark below.

Zodiacal light visible April 1, 6, 10, 14, 16, 30; observations on other evenings hindered by moonlight or clouds.

Lunar halo, faint, about 11 P.M., April 25.

Usual report sent to the New England Meteorological Society, May 1, 1885.

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May 1885

Date	Temp. F.M.	Barometer	Attached thermometer	No. 4	Minimum before and after setting	Maximum before and after setting	Gauge	Rainfall in inches	Wind	Clouds	Date
1	10.0	29.835	51.6	47.9	40.3	46.9	68.5	47.7	0		2 NE	10 P	1
2	10.2	29.481	45.2	40.0	36.8	39.5	49.1	40.0	9 1/8	0.805	4 N	10 Pm Fm	2
3	10.2	29.830	44.2	42.0	33.3	41.3	50.0	42.2	0 1/8	0.011	3 NW	1 Rs	3
4	9.7	29.965	44.3	44.3	30.3	43.7	48.2	44.2	0		2 E	0 Rs Fm haze	4
5	10.1	30.036	48.5	50.9	38.0	49.8	50.1	50.1	0		0 calm	9 P M Fm	5
6	9.9	30.004	51.0	52.4	43.8	51.4	59.0	52.0	0		2 E	10 Pm Fm	6
7	10.0	30.001	50.0	49.4	42.1	48.3	52.2	49.0	0		3 E	9 Pm Fm	7
8	10.4	29.912	49.0	43.6	40.4	42.7	51.1	43.9	0 1/8	0.011	1 E	10 P Fog	8
9	10.9	29.716	52.0	54.1	39.8	53.0	53.0	53.0	6	0.530	2 S	3 M Fm	9
10	9.7	29.681	50.0	51.9	40.0	51.4	58.8	51.9	0		1 SW	0 M Fm	10
11	9.8	29.950	50.4	53.1	37.1	52.0	61.3	52.5	0		2 W	10 Pm M Fm	11
12	9.9	30.153	49.4	52.3	36.1	51.8	57.1	52.2	0		1 SW	0 M Fm	12
13	10.2	30.186	52.9	61.8	42.3	60.8	62.2	60.3	0		1 S	7 Pm Rs	13
14	10.1	30.029	51.8	45.8	43.7	45.0	66.0	46.0	see p. 174	0.143	3 N	10 Pm Fm; raining	14
15	10.2	29.908	52.3	64.0	44.9	63.3	63.0	62.9	9 5/8	0.849	2 N	0	15
16	10.2	30.293	57.1	58.3	51.8	57.4	72.5	58.0	0		2 E	0	16
17	9.6	30.162	52.6	56.3	40.1	55.4	58.1	55.9	0		1 E	4 Rs	17
18	10.1	29.955	53.4	59.0	39.0	57.8	61.2	58.0	0		2 E	10 Pm Fm	18
19	10.2	29.790	57.4	67.9	49.1	67.0	66.0	65.5	8	0.706	1 W	4 haze	19
20	10.2	30.150	63.1	60.6	59.3	59.6	80.6	60.1	0		1 E	10 Pm	20
21	10.2	30.312	58.6	58.4	49.2	57.8	60.3	58.6	0		2 E	1 Rs haze	21
22	10.2	30.264	57.8	64.3	46.5	63.3	63.3	63.0	0		2 S	1 Rs haze	22
23	10.6	30.124	58.6	59.8	51.8	58.6	69.0	59.0	0 1/4	0.022	1 E	10 Pm	23
24	9.9	30.216	58.0	61.1	50.3	60.4	61.0	60.8	3 3/8	0.298	2 E	4 Pm Rs Fm	24
25	10.1	30.000	60.0	63.3	53.3	62.0	65.0	62.0	0 1/2	0.0414	1 S	10 Pm	25
26	9.9	29.880	63.8	72.5	58.2	71.8	74.0	71.7	0		2 W	0 P	26
27	10.5	29.962	65.9	76.1	56.1	75.0	78.7	74.9	0		1 W	3 P R R S M Fm	27
28	10.1	30.168	63.1	59.2	52.6	58.3	79.0	59.8	0		2 E	3 Rs Fm	28
29	10.7	30.063	59.8	69.2	43.8	68.0	68.0	67.1	0		1 SW	4 P R Rs	29
30	10.3	29.922	60.2	70.8	45.2	68.9	75.0	68.3	0		1 S	9 Pm Fm	30
31	10.0	29.764	60.1	55.3	54.2	54.4	71.2	55.2	2 3/4	0.243	1 E	10 Pm; raining	31
	10.1	29.923	1690 / 29.996	1765.9 / 57.0	1389.4 / 44.8	173.66 / 5.6.0	1952.5 / 63.0		41 1/2 see p. 174	3.662 Rainfall for month 3.66 in.	52	1.7	172	5.6

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May 1883

Date	Hour P.M.	Barometer	Attached thermometer	No. 4	Wind	Clouds	Zodiacal light	Aurora	Abstract
1									Obsc.
2	8.4	29.656	48.0	45.0	2 NW	0	Visible	None	None
3	8.2	29.890	46.9		1 N	0 P 7m	Twilight	Twilight	None
4									Obsc.
5									Obsc.
6									Obsc.
7									Obsc.
8									Obsc.
9	8.0	29.650	55.0	48.8	1 S	1 P	Twilight and clouds	Twilight and clouds	None
10	8.5	29.813	54.6	48.7	0 calm	0	Visible	None	None
11	8.2	30.028	53.0	46.9	0 NW	1 Pm 7m	Twilight and clouds	Twilight	Aurora
12									Obsc.
13									Obsc.
14									Obsc.
15	8.0	30.010	62.0	61.7	1 W	1 P haze	Twilight and haze	Twilight and haze	None
16	7.9	30.251	58.1	48.4	0 calm	1 PRs 7m	Twilight	Twilight	Aurora
17	8.3	30.065	55.6	49.3	0 NE	1 Rs haze	Moon and twilight	Moon and twilight	None
18									Obsc.
19									Obsc.
20	8.3	30.184	61.9	55.4	0 E	9 P haze	Cloudy	Cloudy	Obsc.
21	9.4	30.274	59.7	53.8	0 calm	0	Moonlight	Moonlight	None
22	9.8	30.184	63.1	55.0	2 S	6 P haze	Cloudy	Cloudy	None
23	9.1	30.137	59.0	52.3	1 NE	6 Pm 7m ⇐	Moonlight and clouds	Moonlight and clouds	None
24									Obsc.
25	9.9	29.872	64.7	62.0	2 S	4 Pm 7m	Moonlight and clouds	Moonlight and clouds	None
26	8.3	29.960	69.5	69.0	1 W	4 PRs 7m	Moonlight and clouds	Moonlight and clouds	None
27	8.7	29.998	70.1	67.6	1 N	9 PRs	Moonlight and clouds	Moonlight and clouds	None
28	8.0	30.132	65.7	64.0	1 SE	0 Rs 7m	Twilight	Moonlight	None
29	8.2	29.990	66.2	58.4	1 S	4 PRs	Twilight	Twilight and clouds	None
30									Obsc.
31									Obsc.
	8.5	510 094 30.006	10131 59.6	8763 54.8					

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1883phae.proj.1668C

May 1885.

1, 10.2 A.M. Yesterday cloudy and chilly day and evening, with rain.
2, 11.9 P.M. Day cloudy, with rain; evening clear; no aurora seen.
4, 9.7 A.M. Yesterday mostly clear; thin clouds and haze after 8.5 P.M.; no aurora seen.
5, 10.1 A.M. Yesterday clear at first, cloudy later; evening cloudy.
6, 9.9 A.M. Yesterday cloudy day and evening.
7, 10.0 A.M. Yesterday cloudy day and evening.
8, 10.4 A.M. Yesterday cloudy day and evening.
9, 10.9 A.M. Yesterday cloudy day and evening, with rain.
9, 10.9 P.M. Day rather cool with some clouds; evening somewhat hazy, partly cloudy north and west; no aurora seen.
10, 10.7 P.M. Day and evening clear and cool; no aurora seen.
11, 11.4 P.M. Day cloudy and cool; evening mostly clear; auroral arch 8 3/4 P.M. and later, sky dark below; zodiacal light visible at 8 3/4 P.M.
13, 10.2 A.M. Yesterday mostly rather clear; evening rather cloudy; clouds thin.
14, 10.1 A.M. Yesterday cloudy day and evening; rain this morning, little as yet in gauge.
14, 11.7 A.M. Rain now slight; gauge 1 5/8 ounces, 0.143 inches
15, 10.2 A.M. Yesterday cloudy and rainy day and evening
16, 12.1 A.M. Yesterday warm and rather hazy; no aurora seen.
16, 11.3 P.M. Day clear and cool; evening somewhat cloudy at first, then hazy; whitish band in the north, apparently of auroral light, seen by O.C. Wendell this morning about 12.3 A.M.; no aurora seen this evening; zodiacal light visible about 9 P.M.
18, 12.2 A.M. Yesterday clear and rather cool; evening somewhat hazy; a few clouds; no aurora seen.
19, 10.2 A.M. Yesterday cloudy day and evening, with rain.
20, 10.2 A.M. Yesterday hot and rather cloudy day and evening.
21, 10.7 A.M. Yesterday cloudy day and evening.
22, 11.8 P.M. Day clear and rather warm; evening mostly clear, some cloudy; no aurora seen.

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May 1885

May 22, 9.8 P.M. Day rather clear with some haze; evening rather hazy with thin clouds and lunar halo; no aurora seen.

24, 9.9 A.M. Yesterday mostly cloudy with rain; evening partly clear at times; no aurora seen.

25, 10.1 A.M. Yesterday rather clear at first; afternoon and evening cloudy, with some rain.

25, 10.0 P.M. Day cloudy and warm; evening mostly cloudy, rather clear at present; no aurora seen.

26, 10.5 P.M. About $10^h\ 16^m\ 53^s$ by B 394, very bright meteor, starting about 2° below the Moon moving eastward horizontally about 30°. It began faint and increased to brightness of Venus at the maximum brightness of that planet.

26, 11.9 P.M. Day warm and rather cloudy; evening clear after 10 P.M.; no aurora seen.

27, 10.3 P.M. Day and evening hazy, with thin clouds; no aurora seen.

28, 11.7 P.M. Day and evening clear; no aurora seen.

30, 10.3 A.M. Yesterday rather clear; thin irregular clouds most of the evening; no aurora seen.

31, 10.0 A.M. Yesterday cloudy day and evening, with a little rain.

June 1, 9.9 A.M. Yesterday cloudy day and evening, with some rain.

Bar. max. for May, 21, 30.2 A.M. 30.312, 58.6; min. 2, 10.2 A.M. 29.481, 45.2; C. 13399, max., 29, 80.6; C. 2205, min., 4, 30.3.

Report to Signal Service, sent June 2, 1885.

Aurora looked for every clear evening; results as follows:

May 11, Auroral arch $8\frac{3}{4}$ P.M. and later, sky dark below.

May 16. Whitish band in the north, apparently of auroral light, this morning about $12^h\ 30^m$ A.M.

Zodiacal light visible May 2, 10, 11; observations on other evenings hindered by twilight, moonlight, or clouds.

Lunar halo evening of May 22.

Meteor May 26, $10^h\ 16^m\ 53^s$ P.M., Eastern Time; starting about 2° below the Moon, moving eastward horizontally about 30°; it began faint, and increased to the brightness of Venus at the maximum brightness of that planet.

Usual report sent to the New England Meteorological Society, June 1, 1885.

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June 1885

Date	Time A.M.	Barometer	Attached thermometer	No. 4	Minimum before and after setting	Maximum before and after setting	Gauge	Rainfall in inches	Wind	Clouds	Date
1	9.9	29.652	58.8	60.2	50.1	59.0	59.1	59.1	$1\frac{1}{2}$	0.132	1 W	10 Pm	1
2	9.8	29.738	60.0	63.6	50.3	62.7	68.2	62.7	$0\frac{1}{8}$	0.011	3 NW	8 M Fm	2
3	10.1	30.081	58.6	59.4	49.2	58.3	67.0	59.0	$0\frac{1}{8}$	0.011	1 N	4 M Fm	3
4	10.4	29.900	60.7	71.5	50.0	70.0	70.0	69.7	0		3 SW	8 Pm Fm →	4
5	10.2	29.659	62.0	51.6	50.9	51.0	75.0	52.2	$2\frac{3}{4}$	0.243	3 NE	10 Pm ; a little rain	5
6	10.7	29.923	56.0	62.9	45.0	62.2	62.3	62.2	$12\frac{1}{4}$	1.081	2 NW	1 Rs M Fm	6
7	10.3	29.939	58.8	70.6	46.6	69.1	69.2	68.0	0		2 SW	9 Pm Fm →	7
8	10.4	29.452	65.7	77.4	59.0	76.1	76.1	75.9	$0\frac{1}{4}$	0.022	2 SW	9 Pr Rs Fm	8
9	10.1	29.801	59.6	55.3	48.9	54.3	83.2	55.3	$2\frac{3}{4}$	0.243	2 NW	9 Pm Fm	9
10	10.5	30.187	58.4	66.0	44.8	65.1	65.0	65.0	0		2 SW	0	10
11	10.3	30.249	62.4	70.6	51.7	69.2	73.5	68.8	0		1 W	1 Rs Fm	11
12	10.0	30.194	63.1	70.3	52.1	69.1	77.3	69.0	0		1 SW	0	12
13	10.5	30.124	65.7	73.8	57.4	72.3	79.7	71.2	0		2 SW	0 Rs	13
14	10.0	29.839	68.7	76.4	63.2	75.1	80.2	74.2	0		3 SW	6 Pm M Rm Fm /	14
15	10.1	30.090	69.5	71.4	62.3	70.3	83.5	70.7	0		1 NW	0 Rs	15
16	10.4	29.901	71.1	82.1	62.0	80.8	81.6	80.0	0		2 W	1 Rs Fm	16
17	10.0	29.910	73.2	69.8	66.4	68.2	89.6	69.2	0		1 NW	10 P	17
18	10.2	30.176	67.6	69.0	55.7	68.0	75.5	68.5	0		1 W	0 M Fm	18
19	10.1	30.223	67.7	73.7	54.7	72.6	76.6	72.7	0		0 calm	0 haze	19
20	10.0	30.170	69.2	77.4	58.3	76.3	83.4	76.0	0		1 SW	4 Rs Fm	20
21	9.6	30.074	70.0	74.3	58.8	73.1	86.0	73.0	0		2 S	8 Pr Rs	21
22	9.3	29.711	70.4	74.5	62.7	73.1	81.4	73.2	0		3 S	10 Pm M Fm /	22
23	11.0	29.918	64.1	62.9	50.0	62.1	81.0	62.3	$1\frac{3}{4}$	0154	2 NW	0 Fm →	23
24	9.8	30.110	63.1	66.1	56.2	65.3	69.2	65.8	0		2 W	0 haze	24
25	10.7	30.152	68.7	76.7	56.9	75.9	77.0	75.3	0		2 NW	0 Rs Fm	25
26	10.2	30.118	72.0	78.1	63.1	76.9	83.0	76.4	0		1 SW	0 M Fm haze	26
27	10.7	30.084	73.1	80.7	63.0	79.5	84.0	79.2	0		2 SW	5 P M Fm → Fm /	27
28	10.0	30.029	74.0	79.7	66.1	78.0	84.7	77.5	0		1 S	10 Pm M Fm	28
29	10.3	29.766	74.3	77.7	67.7	76.2	81.2	76.2	$14\frac{3}{8}$	1.269	0 calm	10 Pm M Fm	29
30	10.3	29.628	69.6	67.9	59.2	67.1	79.2	67.5	$10\frac{1}{8}$	0.960	3 NW	7 M Fm →	30
	10.2	29.961 / 29.863	65.9	70.4	56.1	69.2	76.8		$46\frac{3}{4}$	4.126 Rainfall for month 4.13 inches	52	1.7	140	4.7

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June 1885

Date	Time R.M.	Barometer	Attached thermometer	No. 4	Wind	Clouds	Zodiacal light	Aurora	Abstract
1	8.1	29.678	63.1	53.9	1 E	0 Pm M Fm	Twilight	Twilight	None
2	8.1	29.910	62.3	57.4	2 N	4 Rs M Fm	Twilight and clouds	Twilight and clouds	None
3	8.2	30.036	64.2	57.6	1 E	5 Rs Fm	Twilight and clouds	Twilight and clouds	Suspected
4		~~29.708~~		~~47.6~~	~~2 N~~	~~10 Pm Fm~~	~~Cloudy~~	~~Cloudy~~	Obsc.
5	8.2	29.708	56.6	47.6	2 N	10 Pm Fm	Cloudy	Cloudy	None
6	8.2	30.010	63.3	61.7	0 calm	1 R R Rs Fm	Twilight and clouds	Twilight and clouds	None
7									Obsc.
8									Obsc.
9	8.0	29.993	60.0	55.2	0 calm	0 Rs Fm	Twilight	Twilight	None
10	8.0	30.206	67.2	64.6	2 SW	2 Rs Fm	Twilight	Twilight	None
11	8.2	30.202	69.1	64.4	2 S	1 P Rs Fm	Twilight	Twilight	None
12	8.1	30.157	70.1	65.7	2 S	1 Rs Fm	Twilight	Twilight	None
13	8.2	30.018	72.1	69.0	2 S	0 Fm	Twilight	Twilight	None
14	8.1	29.870	76.0	75.0	2 W	0 Fm	Twilight	Twilight	None
15									None
16									Obsc.
17									Obsc.
18	8.1	30.173	74.1	68.1	1 SW	0 P Fm	Twilight	Twilight	None
19									None
20									Obsc.
21	8.2	29.984	72.9	67.2	1 S	0 Rs Fm	Twilight	Twilight	None
22	9.2	29.856	68.9	61.9	3 W	0	Moonlight	Moonlight	None
23	8.5	29.920	68.7	62.2	2 SW	0 Pm Fm	Twilight	Twilight	None
24									Obsc.
25	8.1	30.134	75.9	72.0	1 SW	0 Rs Fm	Twilight	Twilight	Suspected
26	8.4	30.110	77.7	72.3	2 S	3 Pm M Fm	Twilight	Twilight	None
27	8.1	30.078	77.5	72.9	1 S	4 Pm Fm	Twilight	Twilight and clouds	None
28									Obsc.
29									Obsc.
30	~~8.3~~								Obsc.
		540036	12397	11487					
	8.3	30.002	68.9	63.8					

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June 1885

1, 10.3 P.M. Day cloudy, becoming clearer; passing shower about 5.5 P.M.; evening mostly clear; no aurora seen.

3, 10.1 A.M. Yesterday rather cloudy; thin clouds early in the evening, increasing later; no aurora seen.

3, 11.8 P.M. Day somewhat cloudy; evening mostly clear, with some thin clouds; aurora slightly suspected during the evening; some appearance of streamers at 11 P.M., not now perceptible in moonlight.

5, 10.2 A.M. Yesterday cloudy day and evening; rain during night and early today.

5, 1.2 P.M. Heavy rain for the last half hour; No. 4 snow 18.9

5, 11.5 P.M. Day cloudy with rain, at times heavy; evening cloudy till 9 P.M., clear 10 P.M. and later; no aurora seen.

6, 11.5 P.M. Day and evening mostly clear and warm; no aurora seen.

8, 10.4 A.M. Yesterday cloudy with a little rain in the forenoon, afternoon mostly clear, evening cloudy; thunder shower early today.

9, 10.1 A.M. Yesterday cloudy with a thunder shower about 2½ P.M.; clear later; evening mostly cloudy.

9, 11.6 P.M. Day and evening clear and cool; no aurora seen.

10, 11.0 P.M. Day clear; evening rather clear with thin clouds and haze; no aurora seen.

11, 10.5 P.M. Day clear; evening rather clear; becoming rather cloudy at 10 P.M.; no aurora seen.

12, 11.5 P.M. Day somewhat cloudy; evening mostly rather clear; no aurora seen.

14, 12.2 P.M. Yesterday clear and warm day and evening; no aurora seen

14, 10.8 P.M. Day and evening clear and warm; no aurora seen.

16, 10.4 A.M. Yesterday clear and warm; evening partly cloudy; no aurora seen.

17, 10.0 A.M. Yesterday mostly rather clear; evening mostly cloudy; a few drops of rain.

18, 10.2 A.M. Yesterday cloudy at first, rather clear later; thin clouds in the evening.

18, 11.3 P.M. Day and evening clear and warm; no aurora seen.

20, 10.0 A.M. Yesterday clear and warm day and evening; no aurora seen.

21, 9.6 A.M. Yesterday rather clear and hot; thin clouds in the evening.

21, 9.8 P.M. Day clear and warm; evening clear till 9½ P.M., thin cloudy; no aurora seen.

22, 10.8 P.M. Day cloudy at first, with shower about 10 A.M.; afternoon and evening clear and cool; no aurora seen.

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June 1885

3, 10.3 P.M. Day mostly clear and cool; evening rather clear, with occasional clouds; no aurora seen.

25, 11.1 P.M. Yesterday clear and warm with thin clouds in the evening. Today clear and warm day and evening; aurora arch now suspected; moonlight strong.

27, 10.7 A.M. Yesterday clear and warm; thin clouds during the evening at times; no aurora seen.

27, 10.8 P.M. Day warm and somewhat cloudy; a little distant thunder soon after noon; evening somewhat cloudy at first, clear later; no aurora seen.

29, 11.4 A.M. Yesterday cloudy and sultry, with rain in the evening and following night.

30, 11.4 A.M. Yesterday cloudy with scud at 4½ P.M. moving rapidly from the east beneath the upper clouds; thunder shower beginning about 5½ P.M.; some rain later in the evening.

30, 10.6 P.M. Day and evening cloudy and cool.

Bar. max., 11, 10.3 A.M., 30.249, 62.4; min., 8, 10.4 A.M., 29.452, 65.7; ℄. 13399, max., 17, 89.6; ℄, 2205, min., 10, 4418.

Report to Signal Service, sent July 1, 1885.

Aurora looked for every clear evening; none seen certainly, but suspected June 3 and 25, during the evening.

Zodiacal light not seen; observations hindered by twilight.

Thunder and lightning: June 8. Thunder shower early today and also about 2½ P.M.

June 27. A little distant thunder soon after noon.

June 29. At 4½ P.M., scud moving rapidly from the east below the upper clouds; thunder shower, beginning about 5½ P.M.

Usual report sent July 1, to the New England Meteorological Society.

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July 1885

Date	7h A.M.	Barometer	Attached thermometer	No. 4	Minimum before and after setting	Maximum before and after setting	Gauge	Rainfall in inches	Wind	Clouds	Date
1	10.2	29.644	65.2	62.0	52.1	61.1	70.0	61.4	0½	0.044	2 NW	10 Pm Fm	1
2	10.2	29.788	65.3	68.3	54.0	67.5	67.3	67.3	0		2 SW	4 R Rs M Fm	2
3	10.4	29.833	68.0	69.6	57.8	68.7	75.0	69.0	0¼	0.022	1 NW	4 M Fm	3
4													4
5													5
6	10.4	30.248	72.1	72.5	53.0	74.1	79.6	74.9	1	0.088	1 N.	7 Fm	6
7	10.3	30.150	73.0	76.7	64.7	75.2	77.6	75.4	{See Aug 18 2}	0.066	2 E	9 Pm M Fm	7
8	9.5	30.043	74.6	77.2	69.0	76.2	81.2	76.5	1½	0.132	1 N	0	8
9	10.0	29.920	76.1	82.9	68.3	81.1	85.3	80.2	0		1 SW	1 R haze	9
10	10.9	29.734	77.2	79.0	68.9	77.7	90.0	78.0	3⅜	0.298	3 W	10 Pm Rs M Fm → Fm → Fm →	10
11	10.1	29.949	73.6	73.5	62.6	72.4	82.5	72.7	0¼	0.022	1 NW	1 Pm M Fm	11
12	10.3	30.142	69.0	71.3	55.2	70.2	77.8	70.5	0		2 NE	0 Fm	12
13	10.5	30.050	69.3	74.3	55.1	73.1	75.3	73.0	0		1 S	0 Rs Fm	13
14	10.6	29.852	70.0	70.3	57.5	69.2	77.8	69.7	0		2 SE	10 Pm Fm	14
15	10.3	29.880	70.0	72.4	60.1	71.7	71.5	71.6	1½	0.132	2 W	0 M Fm	15
16	9.9	30.168	72.0	74.9	62.2	74.0	79.7	74.0	0		1 N	1 M Fm haze	16
17	9.8	30.102	73.7	81.9	63.2	80.8	81.7	80.3	0		1 S	5 Pm Fm	17
18	9.8	30.016	79.7	82.9	74.6	82.0	89.2	82.0	0		2 NW	3 M Fm →	18
19	9.8	30.102	72.0	70.2	57.6	69.2	85.5	69.9	0		2 E	1 R Rs	19
20	10.3	30.003	74.5	78.9	67.1	77.8	77.8	77.8	0		2 NW	2 PRs M Fm →	20
21	10.6	29.798	78.0	85.1	67.7	84.0	85.7	83.0	0		2 SW	3 Pm Rs Fm →	21
22	10.3	30.028	78.2	79.9	68.8	78.8	90.3	78.9	0		2 NW	5 M Fm	22
23	10.8	30.250	74.7	78.9	60.2	77.2	85.5	77.4	0		1 SE	4 PRs	23
24	9.6	30.156	75.7	78.7	67.0	77.4	79.7	77.2	0		2 SW	5 Rs M Fm	24
25	10.0	29.930	77.9	82.3	71.4	81.0	84.7	81.0	0		2 W	10 Pm M Fm	25
26	10.1	29.949	80.6	83.8	72.2	82.6	90.7	82.8	1¼	0.110	1 N	5 M Fm →	26
27	9.6	30.200	72.9	72.9	58.2	72.1	86.7	72.3	0		2 NE	0 Fm	27
28	10.4	30.050	70.8	74.3	56.4	73.2	78.1	73.2	0		1 E	0 haze	28
29	10.7	29.844	73.9	78.8	61.8	77.2	78.6	77.2	0		2 S	9 Pm M Fm →	29
30	10.1	29.876	71.4	69.0	62.0	68.0	82.2	68.5	6⅝	0.585	2 NE	10 Pm	30
31	10.8	29.900	71.2	72.9	61.7	71.4	71.5	71.5	0		1 W	1 M Fm haze	31
	10.2	869.605	21206	21984	1810.4	21678	2338.1		sec 1.. 18½	1.499	47	1.6	120	4.2	
	29.847	29.986	73.1	75.8	62.4	74.8	80.6								

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July 1885

Date	Time P.M.	Barometer	Attached thermometer	No. 4	Wind	Clouds	Zodiacal light	Aurora	Abstract
1	8.6	29.730	67.0	61.0	0 calm	10 Pm Fm →	Cloudy	Cloudy	Obsc.
2	8.1	29.813	70.6	65.9	0 NW	5 Pm Rs Fm →	Cloudy	Twilight and clouds	Obsc.
3									Blank
4									Blank
5									Obsc.
6	8.8	30.201	72.4	66.7	0 calm	4 Pm Fm	Cloudy	Cloudy	Obsc.
7									Obsc.
8	8.5	30.032	80.7	78.1	1 SW	1 Rs Fm	Twilight	Twilight	None
9									Obsc.
10	8.6	29.834	79.2	70.4	1 W	1 Fm	Twilight	Twilight	None
11	8.2	30.036	77.2	69.3	0 calm	0 Fm	Twilight	Twilight	None
12	10.3	30.100	72.6	63.2	0 calm	0 Fm	None	Strongly suspected	Aurora
13									Obsc.
14									Obsc.
15	8.9	30.002	76.2	70.7	0 calm	0 Pm Rs	Moonlight	Twilight and clouds	None
16	8.7	30.140	77.1	71.9	0 N	1 Fm haze	Moonlight	Twilight, moonlight, and clouds	None
17	8.6	30.001	81.3	80.3	1 S	2 PRs Fm haze	Moonlight and clouds	Twilight, moonlight, and clouds	None
18									None
19	8.6	29.982	75.7	71.1	1 SE	1 PRs	Moonlight and clouds	Twilight, moonlight, and clouds	None
20	8.6	29.994	80.8	75.0	2 SE	5 PRs	Moonlight and clouds	Twilight, moonlight, and clouds	None
21	8.4	29.802	82.6	79.0	1 SW	5 PRs Fm	Moonlight and clouds	Twilight, moonlight, and clouds	None
22	8.2	30.119	79.7	74.9	2 N	0 Rs	Twilight and moonlight	Twilight and moonlight	None
23	8.1	30.219	79.4	72.7	1 SE	0 PRs	Twilight and moonlight	Twilight and moonlight	None
24									Obsc.
25	8.4	29.886	82.3	78.5	0 SW	5 Pm Rs Fm	Twilight, moonlight, and clouds	Twilight and moonlight	None
26									Obsc.
27	8.4	30.147	76.4	67.9	1 S	0 Fm	Twilight and moonlight	Twilight and moonlight	None
28	8.6	29.987	76.1	69.3	2 E	3 Fm Rs	Twilight and moonlight	Twilight and moonlight	None
29									Obsc.
30									Obsc.
31									Obsc.
	8.6	540025 / 30.001	13873 / 77.1	12869 / 71.5					

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July 1883

1, 10.2 A.M. Yesterday cool and cloudy day and evening.

2, 10.4 A.M. Yesterday rather clear; evening mostly cloudy.

6. 10.4 A.M. Yesterday quite comfortable and somewhat cloudy during day and evening. Lightning (with no thunder or rain) last evening, especially in north and east. Gauge emptied. H.

6, 5.3 P.M. Gauge again examined about 4½ P.M.; 0¾ inches, 0.066 inches.

7, 10.3 A.M. Yesterday evening partly cloudy, especially in the north and west.

8, 9.5 A.M. Yesterday cloudy and sultry day and evening.

8, 11.5 P.M. Day and evening hot and mostly clear; no aurora seen;

9, 11.3 P.M. Day hot; afternoon rather cloudy, with thunder shower beginning about 5½ P.M.; evening rather cloudy.

10, 11.2 P.M. Day rather hot and cloudy; slight shower about 6 P.M.; evening mostly clear; no aurora seen.

11, 11.9 P.M. Day and evening mostly clear; no aurora seen.

12, 11.3 P.M. Day and evening clear; aurora strongly suspected at 10.3 P.M. with some appearance of streamers; no aurora now visible.

14, 10.6 A.M. Yesterday mostly clear; evening mostly cloudy.

15, 10.3 A.M. Yesterday mostly cloudy day and evening, with a little rain.

16, 12.3 A.M. Yesterday mostly clear day and evening; no aurora seen.

17, 9.8 A.M. Yesterday mostly clear day and evening; no aurora seen.

17, 11.5 P.M. Day and evening mostly hot and clear; no aurora seen.

19, 9.8 A.M. Yesterday mostly clear; thin passing clouds in the evening; no aurora seen.

19, 11.3 P.M. Day clear and warm; many thin clouds in the evening; no aurora seen.

21, 10.6 A.M. Yesterday mostly clear, hot; many thin clouds in the evening; no aurora seen.

21, 11.3 P.M. Day somewhat cloudy, with a few drops of rain at times; evening somewhat clear, with many thin clouds; no aurora seen.

22, 11.2 P.M. Day and evening rather hot and clear; no aurora seen.

23, 11.3 P.M. Day and evening clear and warm; no aurora seen.

25, 10.0 A.M. Yesterday cloudy and rather sultry day and evening.

26, 10.1 A.M. Yesterday cloudy with thunder shower about 3½ P.M.

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July 1885

evening partly clear; no aurora seen.

27, 9.6 A.M. Yesterday cloudy and hot, cooler towards night; evening cloudy,
27, 11.6 P.M. Day and evening clear and warm; no aurora seen.
28, 11.2 P.M. Day mostly clear and warm; some passing clouds in the evening; no aurora seen.
30, 10.1 A.M. Yesterday cloudy; thunder beginning about noon, accompanied later by lightning and rain; rain heavy about 5 P.M.; evening cloudy.
31, 10.8 A.M. Yesterday mostly cloudy, clearer towards night; evening mostly rather cloudy,
31, 10.6 P.M. Day rather clear, cloudy towards night, with rain and a little thunder about 7 P.M.; evening mostly cloudy.

Bar. max., 23, 10.8 A.M., 30.250, 747; min., 1, 10.2 A.M., 29.644, 652; Ca 13399, max., 26, 907; G. 2205, min., 1, 52.1. Obs. C. & W. 6, 10.4 A.M.

Report to Signal Service, sent August 1, 1885.

Aurora looked for on every clear evening, except July 3 and 4, when there were no observations. On July 12, aurora was strongly suspected at about 10¼ P.M.; some appearance of streamers; none visible an hour later.

Zodiacal light not seen; observations hindered by twilight, moonlight, and cloudy.

Thunder and lightning as follows:

July 5. Lightning during the evening, especially in the north, without thunder or rain.
July 9. Thunder shower, beginning about 5½ P.M.
July 25. Thunder shower about 3½ P.M.
July 29. Thundy beginning about noon, accompanied later by lightning and rain; rain heavy about 5 P.M.
July 31. Rain and a little thunder about 7 P.M.

Report sent August 1, 1885, to New England Meteorological Society. In this, at the request of the society, the maximum readings are referred to the date preceding that of the corresponding minimum readings.

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August, 1885

Date	Time A.M.	Barometer	Attached thermometer	No. 4	Minimum before and after setting	Maximum before and after setting		Gauge	Rainfall in inches	Wind	Clouds	Date
1	10.8	29.958	73.1	76.6	63.1	75.2	77.8	75.3	0 1/8	0.011	2 SE	2 M Fm haze	1
2	9.9	30.004	71.8	70.0	63.3	69.0	76.9	69.0	11 1/4	0.993	0 calm	10 Pm Fm	2
3	9.3	30.099	70.3	70.9	62.1	69.9	70.7	70.0	0 1/8	0.011	2 E	8 Pm Rs Fm	3
4	10.3	29.748	72.0	72.8	65.9	71.7	73.2	72.0	5 5/8	0.496	2 S	10 Pm Fm	4
5	10.1	29.892	73.7	74.7	64.7	74.0	81.3	74.0	0		1 N	0	5
6	9.2	30.090	69.4	64.9	60.9	64.0	80.3	64.7	0 1/4	0.022	3 N	10 Pm M Fm	6
7	10.3	30.113	66.9	68.0	52.6	66.7	71.7	67.0	0		2 N	10 P Rs Fm	7
8	10.1	30.181	69.6	69.0	60.0	68.2	72.1	68.6	0		3 E	0 M Rs Fm	8
9	9.7	30.200	67.4	68.6	54.3	67.3	72.0	68.0	0		3 E	7 M Fm ⟋ Fm ⟋	9
10	10.0	30.135	69.6	71.8	60.9	70.3	71.0	70.6	0		1 SW	10 Pm M Fm →	10
11	10.0	30.120	73.8	77.8	67.5	76.3	79.1	76.4	0		2 SW	5 Pm M Fm /	11
12	10.0	30.088	75.1	79.1	69.1	77.5	83.7	77.8	0 1/2	0.014	1 W	8 M Fm / Rs haze	12
13	11.4	29.898	79.0	85.0	71.9	83.3	86.1	83.6	0		2 S	9 M Fm Rs	13
14	10.5	29.698	78.3	80.8	73.2	79.4	86.0	79.5	0		2 W	9 Pm M Fm /	14
15	10.9	29.948	70.3	66.1	59.0	65.1	85.0	66.0	0		1 N	9 Pm M Rs Fm → ⟋ Fm ⟋ Fm	15
16	9.9	30.178	66.1	67.2	53.3	66.3	71.2	67.0	0		1 NE	0 Rs	16
17	10.5	30.261	68.0	70.9	53.6	70.1	73.2	70.0	0		1 SW	0 Fm	17
18	10.7	29.996	71.7	75.0	62.3	73.9	77.5	74.0	0		2 W	2 M Fm haze	18
19	10.0	29.757	71.8	68.8	65.5	67.4	80.1	68.3	1	0.088	1 SW	10 Pm Fm a little rain	19
20	10.0	29.970	69.0	65.0	59.1	64.1	78.7	65.0	0		3 N	0 Rs Fm	20
21													21
22													22
23													23
24													24
25													25
26	10.0	29.506	62.6	59.3	48.5	59.8	83.1	61.7	23 3/4	2.096			26
27	11.0	30.050	58.8	58.0	47.3	57.9	62.4	58.5					27
28	10.0	30.141	58.9	57.1	46.1	56.6	63.1	57.3					28
29	11.3	30.186	62.1	62.9	52.3	61.9	65.0	63.8					29
30													30
31	10.5	29.800	62.0	62.2	54.0	61.2	65.6	61.3	14 1/4 30 1/4	1.258	1 SE	10 Pm fog	31
		749322	17313	17425	1490.5	17171	1886.8		56 1/8	5.019 Rainfall for month 5.019 inches	36	129	
	10.3	29.977	69.3	69.4	59.6	68.7	75.5				1.7	6.1	

29.864

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August 1885

Date	Time P.M.	Barometer	Attached thermometer	No.4	Wind	Clouds	Zodiacal light	Aurora	Abstract
1									Obs.
2									Obs.
3									Obs.
4	8.4	29.796	77.4	73.3	2 S	0 Pm	Twilight	Twilight	None
5									Obs.
6	9.2	30.106	71.1	62.3	0 calm	0	None	None	Aurora
7									Obs.
8	8.1	30.200	72.8	65.1	0 SE	0	Twilight	Twilight	None
9	8.5	30.159	72.3	64.8	1 E	5 Pm Fm haze	Twilight and clouds	Twilight and clouds	None
10									Obs.
11	8.0	30.094	77.6	73.5	0 calm	2 PRs haze	Twilight and clouds	Twilight and clouds	None
12	9.3	30.026	80.0	76.3	1 S	1 Fm haze	Cloudy	None; some clouds	None
13									Obs.
14	8.4	29.794	80.7	73.4	2 W	2 Fm	Moonlight and clouds	Moonlight and clouds	None
15	8.3	30.000	70.8	61.9	0 W	0	Moonlight	Moonlight	None
16	7.7	30.241	73.0	64.5	1 SE	0 Rs	Twilight and moonlight	Twilight and moonlight	None
17									Obs.
18									Obs.
19									None
20									Blank
21									Blank
22									Blank
23									Blank
24									Blank
25									Blank
26	7.8	29.861	63.9	55.2					Blank
27	7.4	30.074	63.2	56.0					Blank
28	7.0	30.057	65.8	60.4					Blank
29	7.0	30.1[illegible]6	66.0	61.2					Blank
30									Blank
31									Blank
	8.0	30.041	70.3	65.2	390538	91141	8479		

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August 1883

2, 9.9 A.M. Yesterday somewhat cloudy; thunder showers after 4 P.M.; evening rainy.

3, 9.3 A.M. Yesterday cloudy day and evening; some rain after noon.

4, 10.3 A.M. Yesterday cloudy day and evening; rain early today with a little thunder.

4, 11.2 P.M. Day mostly clear after 10.5 A.M.; evening clear; no aurora seen; some lightning without thunder along the horizon in the northwest and southeast.

6, 9.2 A.M. Yesterday clear and rather hot, becoming cloudy towards night; a little rain in the evening.

6, 11.0 P.M. Day cloudy at first, becoming clear; evening clear; auroral light visible 9.3 P.M. and now.

8, 10.1 A.M. Yesterday mostly cloudy day and evening.

8, 10.8 P.M. Day and evening clear; no aurora seen.

10, 10.0 A.M. Yesterday rather cloudy; evening partly clear, with passing clouds; no aurora seen.

11, 10.0 A.M. Yesterday mostly cloudy day and evening.

11, 10.8 P.M. Day cloudy and sultry with a little rain; evening clear at first; lightning without thunder in the west about 9 P.M.; became cloudy soon after 10 P.M.; no aurora seen.

12, 10.2 P.M. Day rather hot and cloudy; evening partly clear, with some haze and clouds; lightning in the northwest, without thunder, 9 to 10 P.M.; clouded up suddenly about 10 P.M.; no aurora seen.

13, 11.4 A.M. Partly clear last evening 10½ to 11 P.M.; no aurora seen.

14, 10.5 A.M. Yesterday cloudy day and evening.

14, 10.7 P.M. Day rather cloudy; evening partly clear; no aurora seen.

15, 11.6 P.M. Day and evening clear; no aurora seen.

16, 11.0 P.M. Day and evening clear; no aurora seen.

18, 10.7 A.M. Yesterday clear, cloudy towards night and in the evening.

19, 10.0 A.M. Yesterday mostly clear, evening cloudy; rain this morning.

20, 10.0 A.M. Yesterday rather cloudy; evening partly clear; no aurora seen.

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1885.

Notes on Weather Observations.

Aug. 26. The weight of the water in the rain gauge was 23 3/4 oz. - the combined rain fall of a violent shower Monday (24th) P.M. and steady rain on Tuesday the 25th. Note added Sept. 1. The violent shower was attended by thunder and lightning.

Bar. max., 17, 10.5 A.M., 30.261, 68.0; min., 14, 10.5 A.M., 29.698, 78.3; C. 13399, max., 13, 86.1; G. 2205, rain, 28, 46.1. Obs. D. B. Katte, Aug. 26, 27, 28, 29.

Report to Signal Service, sent Sept. 1, 1885.

Aurora looked for every clear evening, to August 19 inclusive; no observations later in the month; auroral light visible Aug. 6, 9.20m P.M. and later.

Zodiacal light not seen; observations hindered by twilight, moonlight, and clouds.

Thunder and lightning. Aug. 1. Thundershowers after 4 P.M.

Aug. 4, evening; some lightning without thunder along the horizon in the northwest and southeast.

Aug. 11. Lightning without thunder in the west about 9 P.M.

Aug. 12. Lightning in the northwest, without thunder, 9 to 10 P.M.

Aug. 24. Thunder shower towards night.

Usual report sent Sept. 4 to N. E. Meteorological Society. Maximum reading always referred to previous date as last month.

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September, 1885.

Date	7 A.M.	Barometer	Attached thermometer	No. 4	Minimum before and after setting		Maximum before and after setting		Gauge	Rainfall in inches	Wind	Clouds.
1	9.7	29.873	63.0	64.6	53.7	64.0	69.0	63.7	0		1 SW	0 Rs
2	9.8	29.980	62.0	58.2	51.1	57.2	74.0	58.1	0½	0.044	3 W	1 M 7m
3	10.0	30.196	59.0	61.8	43.8	61.0	63.3	61.0	0		1 SW	0
4	10.1	30.069	63.2	68.4	54.3	67.3	68.1	67.2	0		1 SW	5 Rs 7m
5	10.0	29.950	67.7	67.5	61.9	66.2	76.7	68.2	2	0.177	1 N	7 Pm Pr
6	9.0	30.130	60.8	56.6	44.0	54.8	68.8	56.9	0¾	0.033	2 N.W.	1 Rs
7	9.9	30.218	60.3	60.0	46.0	59.0	64.9	59.9	0		0 N.	6 Pm Pr. Rs.
8	11.7	30.170	63.0	67.5	44.0	66.0	66.5	66.9	0		1 N.N.E.	4 Pr. 7m.
9	9.8	29.724	62.8	65.0	53.3	63.7	68.8	64.8	7	0.618	0 N.N.W.	10 Pm. P.
10	9.7	30.020	58.4	51.4	45.8	50.4	75.8	53.4	4½	0.397	3 N.N.E.	10 Pm. P.
11	9.7	30.274	55.8	56.7	41.2	56.0	58.2	57.0	0		1 E.	2 7m Pm
12	9.8	30.224	56.3	57.2	42.2	56.2	61.4	58.2	0		0 S.S.E.	1 Rs
13	9.2	30.110	59.7	63.0	50.9	61.9	65.9	62.8	0		4 S.W.	7 Rs Pm P.
14	9.6	29.848	64.0	70.8	59.8	69.2	69.9	68.9	0		5 S.W.	3 Rs Pm
15	9.6	29.838	67.4	72.5	64.7	71.2	79.0	71.0	0		0 calm	0 PRs
16	9.5	29.862	67.8	65.8	59.1	64.9	76.9	67.9	0	see p. 191.	3 N.W.	0
17	9.7	30.252	61.8	57.4	49.0	56.6	70.8	58.2	0	see p. 191.	3 N.N.W.	1 Pm
18	9.0	30.150	60.5	61.2	48.3	60.3	63.7	62.0	0	"	3 S.W.	2 R. Rs. Ps.
19	9.5	30.038	64.2	65.2	54.2	64.2	73.7	66.2	0		1 W.	0
20	~~1.7~~ 9.7	~~30.260~~	~~64.9~~	~~59.3~~	~~47.0~~	~~58.2~~	~~72.9~~	~~61.0~~	~~0~~		~~2 S.S.E.~~	~~2 7m.~~
21	9.6	30.248	57.1	54.0	38.9	53.5	?	56.9	0		1 S.	0.5 R. Rs.
22	9.6	29.824	59.0	60.9	47.3	59.9	64.7	60.2	0		2 S	9 Rs M 7m
23	10.2	29.322	59.7	48.0	46.2	47.2	67.0	49.0	6	0.530	5 NW	9 M 7m >
24	10.2	29.814	50.8	50.7	36.1	49.9	50.2	50.4	0		2 NW	3 P 7m haze
25	9.7	30.186	54.8	54.1	46.1	53.2	57.9	54.0	0		3 N	0 Rs haze
26	9.9	30.350	54.1	57.6	39.5	56.7	58.0	56.9	0		2 SW	0
27	10.0	30.156	58.9	64.0	50.7	63.2	67.3	63.2	0		0 calm	0 haze
28	10.6	30.112	62.0	63.9	55.2	63.0	69.2	63.4	0		1 E	5 7m haze
29	10.2	30.190	61.0	64.2	52.2	63.1	64.5	63.5	0		2 NE	0 7m haze
30	10.2	30.050	59.1	62.1	47.9	61.2	66.4	61.7	0		2 N	0 Rs 7m
									20⅜	1.799 rainfall for month 1.80 inches	53 1.5	86 3.0
	9.8	871278	17542	17693	143 14	17610	18806					
24.958		30.088	60.5	61.0	49.4	60.7	67.2					

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September, 1885.

Date	Time P.M.	Barometer	Attached thermometer	No. 4	Wind	Clouds	Zodiacal light	Aurora	Abstract
1									Obsc.
2									None
3									None
4									Obsc.
5									Suspected
6									None
7									None
8									Obsc.
9	7.9	29.760	65.9	54.4	2 S.W.	10 P	None. Clouds.	None. Clouds.	Obsc.
10	7.0	30.164	61.4	53.1	0 N.	1 R	None.	None.	None
11	9.7	30.242	61.2	49.9	1 E.	0	None.	None.	None
12	10.0	30.166	62.9	54.7	1 S.W.	0	None.	None.	None
13									None
14									Aurora
15	6.6	29.796	74.0	73.5	0 S.W.	8 Pw.	None.	None.	Obsc.
16	8.7	30.002	68.5	58.1	2 N.	0	Moonlight.	Moonlight.	None
17	9.5	30.250	64.6	54.2	1 N.	0	Moonlight.	Moonlight.	None
18									Obsc.
19	11.0	30.040	67.5	59.0	1 N.	0	Moonlight.	Moonlight.	None
20	10.3	30.316	62.5	46.7	0 N	1 Ro.	Moonlight.	Moonlight.	None
21									None
22									Obsc.
23									None
24	7.9	29.863	56.4	52.1	1 W	2 P 7m h	Moonlight	Moonlight	None
25	8.3	30.343	58.1	48.2	0 E	0	Moonlight	Moonlight	None
26	8.6	30.248	62.0	53.8	2 S	0	Moonlight	Moonlight	None
27									Obsc.
28	8.0	30.183	64.2	56.1	0 calm	1 haze	Hazy	Hazy	None
29	8.0	30.132	64.2	55.9	1 E	3 P 7m haze	Hazy	Hazy	None
30	8.3	30.045	52.9	50.4	1 N	0 P haze	None	None	None
	9.3	451 594 / 30.106	9469 / 63.1	8226 / 54.8					

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September 1885.

2, 9.8 A.M. Yesterday mostly clear and warm; evening cloudy, with rain.

3, 10.0 A.M. Yesterday mostly clear and cool day and evening; no aurora seen.

4, 10.1 A.M. Yesterday mostly clear day and evening; no aurora seen.

5. 10.0 A.M. Yesterday comfortable with some cloud. Clouds increasing after sunset. – Thickly cloudy at 2 P.M. Began raining a little after 9 P.M. Rained quite briskly for two hours and then became partly clear for a time, but somewhat more cloudy about midnight. Gauge emptied. No aurora seen. W.

6. 9.0 A.M. Yesterday comfortable and generally cloudy. Began raining about 7 P.M. and continued to rain lightly for about 2 hours. Cleared last of evening. Faint traces of aurora thought to be seen in north. W.

7. 10.0 A.M. Yesterday comfortable and generally pleasant. No aurora seen. W.

8. 11.7 A.M. Yesterday cool and rather cloudy. Clearing in evening. No aurora seen. W.

9. 9.8 A.M. Yesterday moderately cool with increasing cloudiness. Became completely cloudy about 2 P.M. and remained so. Very light rain during evening, beginning with a few drops about 7h 30 P.M. Began raining harder about midnight and continued raining the larger part of night. No aurora seen. Gauge emptied. W.

9. 7.9 P.M. Day rather warm and close. Generally cloudy. Wind variable but ~~generally~~ mainly Southerly. Began raining hard about 7 P.M. Still raining, but not so heavily. No aurora seen. W.

10. 9.7 A.M. Cloudy throughout last night and still cloudy this morning. with somewhat increasing wind.

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September 1885.

No aurora seen. W.

11. 9.7 A.M. Yesterday quite cool and generally pleasant. No aurora seen. W.

11. 9.7 P.M. Day generally clear and quite cool. No aurora seen. W.

12. 9.8 A.M. No aurora seen last evening later than above record. W.

12. 10.0 P.M. Day clear and comfortable — Slightly warmer than yesterday. No aurora seen. W.

13. 9.2 A.M. No aurora seen later last evening than above record. W.

14. 9.6 A.M. Yesterday generally cloudy and cool. Cleared last evening. No aurora seen. W.

15, 9.6 A.M. Yesterday evening partly clear, cloudy for a time about 9 P.M. Aurora light visible near horizon about 11 P.M.

15. 6.7 P.M. Day rather warm and sultry with some clouds. Quite heavy clouds over most of the sky at the present time and light rain falling at intervals. W.

16. 9.8 A.M. A few drops of water in rain gauge but not enough to measure. Gauge undisturbed. No aurora seen last evening. Cloudy throughout evening, except for one or two short intervals in the early part. W.

16. 8.7 P.M. Day somewhat warm in morning changing to cooler in the afternoon. Considerably cloudy the last half of day, but clearing towards evening. No aurora seen. W.

17. 9.7 A.M. No aurora seen later in evening than above. Gauge left as above, undisturbed, with a few drops of water in it. W.

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September 1885

17. 9.5 P.M. Day rather cool and generally clear. No aurora seen. Moonlight. H.

18. 9.0 A.M. No aurora seen later than above last evening. Gauge as above. H.

19. 9.5 A.M. Yesterday rather cool, and with slowly increasing cloudiness. Rather cloudy throughout afternoon and cloudy during evening. (Few drops of water in gauge dried up.) No aurora seen H.

19. 11.0 P.M. Day cool, clear in forenoon, somewhat cloudy in afternoon and early part of evening. No aurora seen. H.

20, 1.7 P.M. Barom. 30.260; attached therm., 64.9; Nos. 4, 57.3; min. before & after setting, 47.0, 58.2; max. do. 73.9, 61.0; gauge 0; wind 2 E.S.E.; clouds 2 Fm.

20. 10.3 P.M. Day cool. A little cloudy in forenoon but mainly clear in afternoon and evening. No aurora seen. H.

21. 9.6 A.M. Max. Thermometer accidentally set before reading. H.

22, 9.6 A.M. Yesterday clear and rather cool; evening partly cloudy; clouds thin; no aurora seen.

23, 10.2 A.M. Yesterday cloudy with rain in the evening.

24, 10.2 A.M. Yesterday cloudy and cool with strong wind and a little rain. Clear late in the evening; no aurora seen.

24, 10.2 P.M. Day partly clear, cloudy at times, rather cool; evening rather clear; no aurora seen; cloudy after 9½ P.M.

25, 11.8 P.M. Day and evening clear; no aurora seen.

26, 11.6 P.M. Day and evening clear, rather warm; no aurora seen.

28, 10.6 A.M. Yesterday clear and warm; evening cloudy.

28, 11.4 P.M. Day mostly clear and warm; evening rather foggy; no aurora seen.

30, 10.2 A.M. Yesterday mostly clear; evening partly cloudy; clear at 11 P.M.; no aurora seen.

30, 11.6 P.M. Day and evening clear; no aurora seen.

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September, 1885.

Bar. max., 26, 9.9 A.M., 30.350, 54.1; min., 23, 10.2 A.M., 29.322, 59.7; C. 13399, max., 15, 79.0; C. 22205, min., 24, 36.1. Observer, O. C. Wendell throughout the month except for records made Sept. 1 to 4 inclusive, 15 at 9.6 A.M., 22 to 30 inclusive.

Report to Signal Service, sent Oct. 1, 1885.

Aurora looked for every clear evening; results as follows:
Sept. 5. Faint traces of aurora thought to be seen in the north late in the evening.
Sept. 14. Auroral light visible near horizon about 11 P.M.

Zodiacal light not seen; observations generally hindered by moonlight or clouds.

Usual report sent Oct. 1, 1885, to New England Meteorological Society. Maximum reading always referred to previous date as last month.

Note on supply of stationery added to Report to Signal Service. There are three more blanks of this form (besides several of older forms) still left here, and ~~three~~ nine of the envelopes.

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October, 1885.

Date	Time P.M.	Barometer	Attached thermometer	No. 4	Minimum before and after setting	Maximum before and after setting	Gauge	Rainfall in inches	Wind	Clouds	Date
1	10.8	30.118	58.0	63.1	44.2	62.1	65.8	62.1	0		2 N	0 P Rs	1
2	10.2	30.099	57.8	57.6	49.6	56.7	65.3	57.0	0		2 E	10 Pm	2
3	9.9	29.803	59.0	58.9	53.0	58.0	58.4	58.3	2 7/8	0.254	1 E	10 Pm; a little rain	3
4	9.6	29.682	63.0	68.8	57.8	67.7	67.2	66.0	see 1/16 0 1/8	0.894	2 S	10 Pm	4
5	10.3	29.991	58.1	53.1	44.1	52.3	72.5	53.0	0 1/4	0.022	2 W	5 M Fm →	5
6	10.5	30.060	55.0	52.5	41.5	51.3	57.5	52.0	0		0 NW	10 P; a little rain	6
7	10.4	30.082	49.8	43.0	33.9	42.1	52.3	43.1	6 1/4	0.552	3 NW	5 M Fm →	7
8	10.9	30.327	49.0	47.2	33.1	46.2	48.0	47.0	0		2 E	10 P	8
9	10.3	30.226	50.1	46.4	37.2	45.8	49.3	46.3	0		2 N	0 P Rs M	9
10	10.0	30.180	51.7	51.3	36.1	50.4	51.2	51.2	0		1 SW	0	10
11	10.9	30.182	55.4	58.5	42.8	57.8	60.2	58.0	0		2 NW	0 M Fm	11
12	10.1	30.326	50.9	46.6	33.1	45.8	62.0	46.7	0		2 E	0	12
13	10.0	30.162	51.3	50.5	40.2	49.6	50.1	50.1	0		2 E	10 Pm Fm	13
14	9.7	29.650	55.7	57.0	48.3	56.0	57.7	56.4	21	1.853	1 NE	10 P mist	14
15	10.6	29.675	55.6	56.3	45.2	55.3	63.4	56.0	4 1/4	0.375	1 W	0 Fm	15
16	10.8	29.860	54.0	52.1	40.0	51.3	61.0	52.2	0		1 NE	0 Fm	16
17	10.8	30.051	52.1	52.1	36.4	51.3	56.9	52.0	0		1 S	1 haze	17
18	10.0	30.081	54.3	55.9	47.5	54.9	58.0	55.2	0		1 SW	4 P Rs Fm /	18
19	10.2	30.161	56.7	61.7	51.3	60.2	64.6	60.4	0		0 S	10 Pm	19
20	9.6	30.228	57.3	62.3	51.7	61.2	65.4	61.1	0		1 S	5 Pm R Rs	20
21	9.9	30.044	60.0	67.2	56.9	66.0	68.4	65.5	0		2 S	10 Pm Fm	21
22	10.6	30.000	54.9	49.2	40.0	48.1	68.4	49.7	3 3/8	0.298	3 NW	1 M Fm →	22
23	10.8	30.080	52.4	49.4	36.1	48.7	53.0	49.4	0		1 W	0 M Rs	23
24	10.7	30.175	49.4	47.8	33.1	47.0	53.7	48.0	0		1 NE	0 M Fm	24
25	9.6	30.250	48.0	45.1	34.1	44.2	53.3	45.1	0		0 calm	0	25
26	10.9	30.158	48.8	46.9	30.5	46.2	51.6	47.0	0		0 S	0 haze	26
27	10.7	30.034	52.2	53.7	41.5	52.9	55.0	53.3	0		1 SW	1 Rs	27
28	10.8	30.127	53.8	50.8	46.1	49.8	61.5	50.7	0 1/8	0.011	0 NE	10 Pm fog	28
29	10.4	29.918	55.0	56.5	49.1	55.5	56.0	56.0	0 1/4	0.022	1 E	10 P	29
30	10.4	29.256	55.5	51.2	47.8	50.2	56.3	51.0	15 3/8	1.356	1 NW	10 P; a little rain	30
31	10.6	29.890	48.7	39.8	33.4	39.0	51.3	40.2	0 1/2	0.044	2 NW	9 PM Fm /	31
	321.0	.876	1678.5	1650.0	1317.6	1623.6	1821.3		see p. 196	5.681 Rainfall for month 5.68	41	1.3	151	4.9
	10.3	30.283	54.15	53.22	42.50	52.37	58.75							

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October 1885.

Date	Time P.M.	Barometer	Attached thermometer	No. 4	Wind	Clouds	Zodiacal Light	Aurora	Abstract
1	8.0	30.114	58.3	52.1	1 NW	0 haze	None	None	None
2									Obsc.
3									Obsc.
4	9.8	29.700	64.9	53.8	2 W	0	None	None	None
5	8.3	30.019	55.2	47.7	1 S	0 Phaze	None	None	None
6									Obsc.
7	9.4	30.212	51.0	40.7	0 W	1 P Fm	Cloudy	None	None
8									Obsc.
9	8.3	30.198	55.1	40.9	0 calm	0	Suspected	None	None
10	8.2	30.150	58.0	52.7	1 SW	0 haze	None	None	None
11	8.2	30.221	57.2	50.1	1 NE	1 P haze	Hazy	Haze and clouds	Suspected
12									Obsc.
13									Obsc.
14	10.3	29.618	57.7	50.1	1 S	0 Rs	None	Suspected	Suspected
15	9.7	29.780	58.6	50.3	1 W	4 P Fm	Moonlight and clouds	Some appearance of streamers	Aurora
16	8.2	29.930	58.1	48.0	0 calm	0 Rs	Moonlight	Moonlight	None
17	8.5	30.070	55.9	49.6	1 SE	0	Moonlight	Moonlight	None
18									Obsc.
19									Obsc.
20									Obsc.
21									Obsc.
22									Obsc.
23	8.5	30.110	55.5	44.2	0 W	0	Moonlight	Moonlight	None
24	7.8	30.190	54.3	43.9	0 SW	0 haze	Moonlight	Moonlight	None
25	8.2	30.213	53.3	42.6	0 calm	0	Moonlight	Moonlight	None
26	8.4	30.090	54.3	47.1	1 S	0	Moonlight	Moonlight	None
27									None
28									Obsc.
29									Obsc.
30									Obsc.
31	8.6	30.128	49.1	34.0	1 NW	0	Suspected	None	Aurora
	1384	.743	8965	7478					
	8.6	30.016	56.03	46.71					

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October 1885

2, 10.2 A.M. Yesterday mostly clear, becoming cloudy after 8 P.M.; no aurora seen.

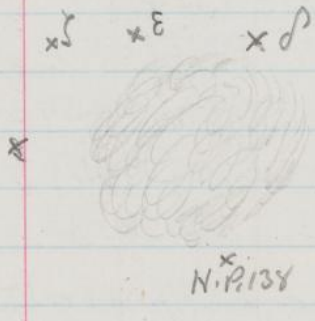
3, 9.9 A.M. Yesterday cloudy day and evening; a little rain towards night.

3, 2.5 P.M. Heavy showers during the day. Gauge now 10 ounces; 0.883 inches.

4, 9.6 A.M. Yesterday afternoon and evening cloudy. Gauge 0⅛ ounces; total 10⅛; 0.894 inches.

4, 11.5 P.M. Day mostly cloudy and warm, with a little rain; clear after 9 P.M.; no aurora seen.

4, 11.7 P.M. Gegenschein somewhat suspected as a reinforcement of the usual band from the Pleiades; centre half way from H.P. 162 to H.P. 138; apparent shape as in sketch.



H.P. 162 α 0h 56m.7 δ +7° 15′
H.P. 138 α 0h 46m.9 δ −1° 48′
Gegenschein α 0h 51m.8 δ +2° 43′

Middle of band appears to pass south of 27 Piscium by half $\Delta\delta$ 27 and 30 Piscium ($1\frac{0}{4}$).

6, 10.5 A.M. Yesterday mostly clear; cloudy after 9 P.M.; no aurora seen.

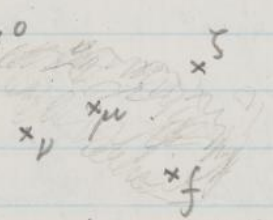
7, 10.4 A.M. Yesterday cloudy day and evening, with rain.

7, 10.5 P.M. Day rather cloudy and cool; evening partly clear, with thin clouds; no aurora seen.

9, 10.3 A.M. Yesterday mostly cloudy day and evening.

9, 10.9 P.M. Day and evening clear and cool; no aurora seen.

9, 11.1 P.M. Gegenschein somewhat suspected as in sketch below.



Centre $\frac{1}{3}$ of the way from μ Piscium to the middle of line from ζ Piscium to f Piscium.

H.P. Place of ζ Piscium	1h	7m.5	+6° 57′
f Piscium	1	11.6	+2 59
Mean	1	9.5	+4 58
μ Piscium	1	23.9	+5 31
Gegenschein	1	19.1	+5 20

Change since Oct. 4 thought to be perceptible.

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October 1885

10, 10.6 P.M. Day and evening rather clear and warm; no aurora seen.

11, 10.7 P.M. Day rather clear and cool; evening clear after about 7 P.M.; aurora somewhat suspected early in the evening among clouds in the north, slightly suspected now in clear sky; some haze; band from Pleiades not distinctly perceptible; Gegenschein not decidedly suspected.

13, 10.0 A.M. Yesterday rather clear and cool; evening rather cloudy.

14, 9.7 A.M. Yesterday cloudy, chilly, and rainy, day and evening.

14, 10.3 P.M. Day cloudy with mist and rain, clearing off in the afternoon; evening clear; auroral light suspected near the northern horizon.

15, 10.6 A.M. Looked carefully for Gegenschein immediately after time of last entry. After remaining out of doors for a time, it was easy to perceive the band from the Pleiades distinctly, but such maxima as were occasionally suspected in it at moments did not appear stationary; so that no effect of Gegenschein could be determined.

15, 11.5 P.M. Day partly cloudy, evening clear after 9½ P.M.; auroral streamers and diffused light over clouds in the north about 9.8 P.M.; low arch now; Gegenschein not distinguishable; the region between the lines of stars α, δ, η Piscium and α, μ, ν, Piscium is perhaps rather a bright part of the usual band.

16, 11.2 P.M. Day and evening mostly clear and warm; no aurora seen.

17, 10.7 P.M. Day and evening clear till about 10½ P.M. when clouds suddenly appeared; no aurora seen; now wholly cloudy.

19, 10.3 A.M. Yesterday rather clear and warm; evening mostly cloudy.

20, 9.6 A.M. Yesterday mostly rather cloudy day and evening.

21, 9.9 A.M. Yesterday mostly rather cloudy day and evening.

22, 10.6 A.M. Yesterday cloudy and warm; evening rainy.

23, 10.8 A.M. Yesterday rather clear and cool; afternoon and evening mostly cloudy.

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October, 1885

23, 10.9 P.M. Day and evening mostly clear and cool; no aurora seen.
24, 10.8 P.M. Day and evening clear and cool; some fog in evening; no aurora seen.
25, 10.9 P.M. Day and evening clear and cool; no aurora seen.
26, 10.9 P.M. Day and evening clear and cool; some thin clouds now; no aurora seen.
27, 10.9 P.M. Day and evening mostly clear; some thin clouds now; no aurora seen.
29, 10.4 A.M. Yesterday cloudy and foggy day and evening.
30, 10.4 A.M. Yesterday cloudy with rain towards night and in the evening.
31, 10.6 A.M. Yesterday cloudy day and evening; a little rain.
31, 11.0 P.M. Day and evening mostly clear and rather cold; aurora suspected about 9½ P.M., arch distinct about $10\frac{20}{60}$ P.M. with dark sky below and some appearance of streamers; light now more diffuse; Zodiacal light suspected about 7 P.M., also at 8.6 P.M. as on 1, 195;

Barometric max., 8, 10.9 A.M., 30.327, 49.0; min., 30, 10.4 A.M., 29.256, 5.5; C. 13399, max., 5, 72.5; 9.2205, min., 26, 30.5.

Report to Signal Service, sent Nov. 3, 1885.

Aurora looked for every clear evening; results as follows:

Oct. 14. Aurora suspected among clouds early in the evening, and in clear sky later.

Oct. 14. Aurora suspected near northern horizon.

Oct. 15. Auroral streamers and diffused light over clouds in the north about $9^h\,50^m$ P.M.; low arch at $11^h\,3.0^m$ P.M.

Oct. 31. Aurora suspected about $9^h\,30^m$ P.M.; arch distinct about $10^h\,20^m$ P.M. with dark sky below and some appearance of streamers; light more diffuse at 11^h P.M.

Zodiacal light suspected Oct. 9 and 31.

Frost. Minimum below the freezing point in the morning of Oct. 26.

Usual report sent Nov. 3, 1885 to the New England Meteorological Society. Maximum reading referred to previous date as customary since June 1885.

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November 1885

200

Date	Time A.M.	Barometer	Attached thermometer	No. 4	Minimum before and after setting		Maximum before and after setting		Gauge	Rainfall in inches	Wind	Clouds	Date
1	9.9	30.310	42.0	34.2	24.2	33.5	44.9	35.0	0		2 N	10 P	1
2	10.5	29.675	50.4	51.3	33.5	50.3	51.0	51.0	2 3/4	0.243	3 E	10 Pm Fm ←; raining	2
3	11.5	29.651	48.6	47.4	34.0	46.2	53.3	47.0	5 3/4	0.509	2 W	5 M Fm →	3
4	10.8	29.938	47.2	44.5	36.2	43.8	48.5	44.7	0		2 W	1 M Fm	4
5	10.2	30.000	48.1	54.0	37.0	52.8	53.0	53.0	0		1 S	7 Pm Fm →	5
6	10.7	30.123	53.8	61.1	50.1	60.0	61.3	59.7	0		0 calm	10 Pm	6
7	10.3	30.129	53.0	51.4	48.6	50.2	60.1	51.0	4 3/4	0.419	1 NE	10 P Fog	7
8	9.7	29.957	57.0	65.0	50.1	63.7	64.0	63.0	1 5/8	0.113	2 S	10 Pm	8
9	10.0	29.611	57.2	55.6	52.8	53.0	64.0	55.2	6 3/4	0.596	1 NW	10 Pm Fm →	9
10	11.5	29.846	50.3	48.2	39.3	47.2	56.2	48.0	0		3 W	9 M Fm →	10
11	10.0	29.794	47.0	46.1	33.9	45.3	48.9	46.1	0		2 W	0 Rs	11
12	10.2	29.743	50.2	54.1	42.4	53.1	54.5	54.3	0		1 SW	10 Pm Fm	12
13	10.4	29.716	53.7	57.0	44.0	56.0	62.0	56.6	0		1 SE	4 P Rs R	13
14	10.8	29.782	52.2	45.8	43.3	45.0	64.9	45.9	0		1 N	10 P	14
15	9.8	29.662	46.6	38.7	33.1	38.0	50.9	39.2	0		2 W	0	15
16	9.5	29.895	44.0	38.0	31.5	37.3	44.6	38.4	0		2 W	0 Rs	16
17	8.9	30.019	45.6	41.8	37.2	41.2	43.8	42.0	0		2 W	0 Fm	17
18	9.6	30.032	45.8	42.7	34.3	41.6	49.9	42.3	0		1 S	9 P Fm	18
19	10.0	29.556	52.6	54.1	41.4	53.1	53.7	53.6	0		0 calm	10 Pm Fm →; a few drops of rain	19
20	9.9	29.820	42.6	32.3	27.5	32.0	54.3	33.0	2 7/8	0.254	1 NW	0 Rs	20
21	9.5	~~29.716~~ 29.799	~~44.5~~ 44.6	33.9	26.2	33.1	38.8	34.3	0		1 N	10 P	21
22	9.5	29.879	41.1	35.1	33.2	34.4	38.9	35.9	0		2 N	10 P	22
23	9.6	29.865	41.2	35.3	33.8	35.0	38.5	35.6	3	0.265	2 NE	10 P; rain and snow	23
24	9.5	29.878	41.3	38.6	32.5	38.0	41.8	38.9	3 3/8	0.298	3 NE	10 Pm Fm	24
25	10.0	29.538	44.0	39.3	36.2	38.4	45.0	39.0	22 1/4	1.964	2 N	10 P; raining	25
26	10.5	29.812	38.0	30.2	29.2	29.8	44.9	30.7	16 1/8	1.423	3 N	10 P; snowing	26
27	9.4	30.199	33.0	25.3	20.7	24.8	30.9	26.0	0 1/8	0.011	1 N	0	27
28	9.3	30.224	34.1	24.3	18.1	23.9	33.9	25.4	0		1 NW	0 P R Rs	28
29	10.6	30.098	35.5	30.8	22.1	30.1	37.0	31.2	0		2 NW	0 Rs	29
30	10.7	30.080	35.6	35.2	23.7	34.2	35.5	35.0	0		3 N	10 Pm Fm	30
	3031	263.50	1377.4	1290.3	1049.1	1267.0	1471.0		69 3/8	6.123	50	195	
	10.1	29.878	45.91	43.01	34.97	42.23	49.03			Rainfall for month 6.12 inches	1.7	6.5	
		-.046											
		29.832											

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November 1885

Date	Time P.M.	Barometer	Attached thermometer	No. 4	Wind	Clouds	Zodiacal light	Aurora	Abstract
1									Obsc.
2	8.0	29.578	50.8	42.3	2 SW	0 haze	Visible	None	None
3	8.2	29.752	49.8	40.8	2 W	8 Pm Fm	Cloudy	Cloudy	None
4	8.1	29.984	44.1	38.2	0 calm	10 P	Cloudy	Cloudy	Obsc.
5									Obsc.
6									Obsc.
7									Obsc.
8									Obsc.
9	8.1	29.692	53.6	45.7	1 W	0	Visible	Low arch	Aurora
10									Obsc.
11	7.9	29.805	51.9	45.4	1 SW	4 P Rs haze	Cloudy	None	None
12									Obsc.
13									Obsc.
14									Obsc.
15									Obsc.
16									Obsc.
17	8.8	30.088	48.6	40.0	1 SW	0	Moonlight	Suspected; moonlight	Suspected
18									Obsc.
19									Obsc.
20	9.0	29.798	46.1	31.9	1 W	0	Moonlight	Moonlight	None
21									Obsc.
22									Obsc.
23									Obsc.
24									Obsc.
25									Obsc.
26									Obsc.
27	8.1	30.238	38.5	27.9	1 N	0 Rs haze	Visible	None	None
28	8.6	30.078	38.3	28.5	1 SW	0	None	None	None
29									None
30									Obsc.
	751	269033	4217	3407					
	8.3	29.893	46.86	37.86					

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November, 1885

2, 10.5 A.M. Yesterday cloudy day and evening.

, 11.4 P.M. Day cloudy with rain, clear towards night; evening clear; no aurora seen.

3, 11.6 P.M. Day partly cloudy; evening mostly clear; no aurora seen.

3, 11.7 P.M. Rather strong suspicion of Gegenschein with centre half way from α Arietis to μ Ceti.

α Arietis $2^h\ 10^m.4$ $+22°\ 54'$

μ Ceti $2^h\ 38^m.5$ $+9°\ 36'$

Gegenschein $2^h\ 19^m.4$ $+16°\ 15'$

Region near α Piscium not so bright, apparently, as last month. Region where Gegenschein was suspected apparently brighter than that near δ Arietis.

4, 8.4 P.M. Day and early evening clear; clouded over about $7\frac{3}{4}$ P.M.; zodiacal light visible about $7\frac{1}{4}$ P.M.

5, 10.2 A.M. Yesterday evening continued cloudy.

6, 10.7 A.M. Yesterday rather cloudy and warm; evening cloudy.

7, 10.3 A.M. Yesterday cloudy day and evening.

8, 9.7 A.M. Yesterday cloudy day and evening, with some rain.

9, 10.0 A.M. Yesterday warm and cloudy, with some rain.

9, 11.6 P.M. Day cloudy, evening mostly clear; low auroral arch still continuing.

11, 10.0 A.M. Yesterday mostly rather cloudy day and evening.

12, 10.2 A.M. Yesterday partly cloudy; evening rather clear at first, clouds and haze increasing; no aurora seen.

13, 10.4 A.M. Yesterday rather cloudy, evening hazy, clouds near horizon.

14, 10.8 A.M. Yesterday rather cloudy; evening cloudy.

15, 9.8 A.M. Yesterday mostly cloudy day and evening.

16, 9.5 A.M. Yesterday clear and cool; evening rather cloudy.

17, 8.9 A.M. Yesterday rather clear; evening mostly cloudy.

17, 11.0 P.M. Day and evening clear and cool, some clouds now; aurora slightly suspected in moonlight at 8.8 P.M., not now.

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November 1883

19
~~18~~, 10.0 A.M. Yesterday cloudy day and evening.
20, 9.9 A.M. Yesterday cloudy with a little rain and in the evening snow.
20, 10.7 P.M. Day ~~Dark~~ evening clear and cool; no aurora seen.
22, 9.5 A.M. Yesterday cloudy day and evening, with a few drops of rain.
23, 9.6 A.M. Yesterday cloudy day and evening, with a few drops of rain.
24, 9.8 A.M. Yesterday cloudy day and evening, with a little rain.
25, 10.0 A.M. Yesterday cloudy day and evening, with rain.
26, 10.5 A.M. Yesterday cloudy day and evening, with rain.
27, 9.4 A.M. Yesterday cloudy day and most of evening, with a little snow.
27, 8.1 P.M. Meteors radiating from Andromeda numerous this evening; probably from 6 to 10 every minute; mostly faint, a few equal to stars of 2nd magnitude, with trails; length of visible path almost always very short; approximate estimate of point of radiation makes it about $\frac{1}{3}$ of the way from α to β Andromedae.
28, 9.3 A.M. Yesterday mostly clear and cold; no aurora seen; meteors much less numerous about 8½ P.M.; they were seen frequently at various times between 5 and 8 P.M.
28, 8.6 P.M. Day and evening mostly clear; cloudy part of middle of day; no aurora seen; zodiacal light visible early in the evening.
30, 5.9 A.M. Yesterday mostly clear, rather cold; evening mostly cloudy; rather clear about 10 P.M. and this morning; no aurora seen.
30, 10.3 P.M. Day and evening cloudy with a little snow.

Barometric max. 1, 9.9 A.M., 30.310, 42.0°; min. 25, 10.0 A.M., 29.538, 44.0°; C. 13399, max., 14, 64.9; G. 2205, min., 28, 18.1°.

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Report to Signal Service, sent Dec. 1, 1885.

Aurora — looked for every clear evening; results as follows:
Nov. 9. Low auroral arch during the evening.
Nov. 17. Aurora slightly suspected in moonlight about 8¾ P.M.

Zodiacal light — visible Nov. 2, 4, 9, 27, 28; observations on other evenings hindered by moonlight or clouds.

Frost — Minimum thermometer below the freezing point on the mornings of Nov. 1, 16, 20, 21, 26, 27, 28, 29,

Meteors — radiating from Andromeda numerous early in the evening of Nov. 27.

Usual report sent Dec. 1, 1885 to the New England Meteorological Society. Maximum readings referred to previous date as customary since June, 1885.

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December 1883.

Date	Time P.M.	Barometer	Attached thermometer	No. 4	Minimum before and after setting		Maximum before and after setting		Gauge	Rainfall in inches	Wind	Clouds	Date
1	9.5	30.196	36.0	26.9	26.1	26.1	35.8	27.7	1 1/2	0.132	3 N	10 R; a little snow	1
2	9.3	29.949	33.0	24.1	21.1	23.5	27.8	25.1	0		2 N	10 P 7m	2
3	9.4	29.248	33.0	32.0	18.1	31.4	32.7	32.2	0 1/4	0.022	1 SW	10 R; a little more	3
4	10.0	29.650	35.0	29.2	22.5	28.9	38.3	30.0	0		1 W	5 Rs M 7m →	4
5	10.0	29.150	39.7	47.3	28.8	46.2	46.6	46.0	1	0.088	2 S	10 Rm 7m ↓	5
6	10.0	29.607	34.0	26.0	21.1	25.7	47.0	28.0	1 1/4	0.110	2 W	0	6
7	9.4	29.542	31.1	19.3	18.1	18.8	31.3	21.6	0		4 W	0 7m	7
8	8.8	30.210	24.5	41.8	10.0	14.3	21.9	16.0	0		1 SW	0 7m	8
9	8.8	29.916	34.3	49.4	14.3	48.0	49.0	45.8	0		3 S	10 Rm 7m ↓	9
10	9.7	29.670	50.1	57.1	47.1	55.9	57.0	55.0	2 1/8	0.188	2 SW	10 Rm 7m ↓	10
11	8.1	30.006	41.4	31.1	29.9	30.8	57.4	32.1	0		1 SW	0 P	11
12	9.6	~~30.277~~ 30.560	~~39.~~ 34.4	29.7	23.1	29.1	37.0	30.0	0		1 W	5 P 7m →	12
13	11.1	30.402	35.3	38.8	23.3	38.1	38.3	38.3	0		1 SE	10 P 7m	13
14	11.1	29.558	45.9	49.1	37.2	48.1	52.1	48.6	7 3/4	0.684	2 SW	10 P 7m	14
15	10.8	29.800	37.0	29.8	29.0	29.0	49.1	30.2	1 3/4	0.154	2 NW	0 7m	15
16	11.4	30.196	35.6	33.4	21.1	32.9	33.3	34.0	0		1 W	1 P 7m	16
17	11.4	30.316	32.9	28.1	21.1	27.2	36.2	28.3	0		2 N	10 P 7m	17
18	11.4	30.126	32.2	25.9	21.0	25.0	29.2	26.8	1	0.088	1 NW	10 R	18
19	10.8	29.500	34.8	34.0	25.0	33.2	33.7	34.0	4 3/4	0.419	2 NW	10 R	19
20	11.8	29.628	34.0	24.8	24.2	24.2	35.2	25.7	0		2 W	7 R	20
21	11.2	29.832	26.4	21.7	11.8	21.0	25.9	23.0	0		1 W	10 R	21
22	10.9	30.229	30.7	24.2	15.1	23.6	34.9	25.8	0		0 SW	1 R Rs	22
23	10.7	29.953	37.7	44.1	23.4	43.0	43.8	43.5	0		1 S	7 R Rs	23
24	10.2	29.875	42.3	44.6	40.6	44.0	51.6	44.3	0		2 W	1 Rs 7m	24
25	11.2	30.321	31.6	23.6	18.4	23.0	44.6	24.7	0		3 N	4 Rs	25
26	11.2	30.106	22.2	15.0	12.2	14.3	25.0	16.0	0		4 N	10 R	26
27	11.5	29.729	24.1	19.4	11.2	18.7	21.3	20.3	0 1/4	0.022	3 N	4 R Rs	27
28	11.0	29.434	29.4	34.3	18.4	33.9	34.0	34.0	0		2 NW	9 P 7m →	28
29	11.5	29.728	35.7	38.1	30.7	37.2	37.9	38.0	0		2 NW	0 Rs	29
30	10.9	30.050	35.0	36.6	24.6	36.1	39.4	36.4	0		1 S	0 Rs	30
31	10.7	29.914	37.0	40.0	29.1	39.0	46.0	39.3	0		1 E	10 P	31
	3234	127399	10665	9924	7176	9702	11933		21 5/8	1.907	56	184	
	10.4	29.884	34.40	32.01	23.15	31.30	38.46				1.8	6.1	

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December 1885.

Date.	Hour. P.M.	Barometer	Attached thermometer	No. 4	Wind	Clouds	Zodiacal light	Aurora	Abstract
1									Obsc.
2	8.6	29.682	35.7	25.0	1 NW	0	Visible	None	None
3	11	29.354	37.0	29.9	2 W	0	None	None	None
4									Obsc.
5									Obsc.
6	8.2	29.494	35.9	25.0	1 SW	0	Visible	Low arch	Aurora
7	8.8	30.000	23.1	12.9	1 SW	0	Faint	Faint arch	Aurora
8									Obsc.
9									Obsc.
10									Obsc.
11	9.1	30.277	39.2	30.1	2 SW	0	Visible	None	None
12	9.0	30.536	32.8	25.9	1 SW	0 P	Moonlight-	Moonlight-	None
13									Obsc.
14									Obsc.
15	9.9	30.058	35.7		1 SW	1 P. 7m	Moonlight	Moonlight-	None
16	9.4	30.311	36.5	29.1	1 W	0	Moonlight	Moonlight-	None
17									Obsc.
18									Obsc.
19	8.4	29.450	37.1	33.7	2 W	10 P 7m	Cloudy	Cloudy	Obsc.
20									None
21									Obsc.
22									Obsc.
23									Obsc.
24	9.5	30.177	36.2	24.6	2 NW	3 Rs	Moonlight and clouds	Moonlight-	None
25									Obsc.
26									Obsc.
27									Obsc.
28	8.7	29.470	35.4	32.7	1 SW	4 P 7m	Visible	None; some clouds	None
29	9.7	29.911	37.9	33.1	1 NW	0	Visible	None	None
30	8.6	30.027	40.5	32.9	1 S	0 Rshazy	Visible	None	None
31									Obsc.
	190	11747	4644	3349					
	22	19643	3573	2761					

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December, 1883.

2, 9.3 A.M. Yesterday cloudy day and evening.

2, 11.6 P.M. Day cloudy, becoming clear; evening clear; no aurora seen.

3, 10.3 P.M. No. 4 in snow and water read 32.3 immediately after morning meteorological observations; left in water during the day; water now frozen on surface and a little snow lower; reading still 32.3; water removed.

3, 11.1 P.M. Day cloudy with snow at first, mostly clear afternoon and evening; no aurora seen; zodiacal light visible about 7½ P.M.

5, 10.0 A.M. Yesterday cloudy at times; a little snow in the evening.

6, 10.0 A.M. Yesterday cloudy day and evening; rain in the afternoon.

6, 10.5 P.M. Day and evening clear and cold; auroral arch still continuing, sky dark below.

8, 8.8 A.M. Yesterday clear and cold day and evening; faint auroral arch; zodiacal light easily visible about 7 P.M.

9, 8.8 A.M. Yesterday clear, becoming cloudy; evening cloudy.

9, 11.6 P.M. Day and evening warm and cloudy, with rain.

11, 8.1 A.M. Yesterday cloudy and warm day and evening.

12, 9.6 A.M. Yesterday mostly clear and cool; no aurora seen.

12, 10.5 P.M. Day mostly clear and cool; haze increasing after 9 P.M.; no aurora seen.

14, 11.1 A.M. Yesterday cloudy day and evening with rain.

15, 10.8 A.M. Yesterday cloudy day and evening, with rain.

15, 10.3 P.M. Day clear and cool; evening sometimes clear, with numerous passing clouds; no aurora seen.

17, 12.3 A.M. Yesterday clear and cool; some thin clouds in the evening; no aurora seen.

18, 11.4 A.M. Yesterday mostly cloudy day and evening, with a little snow; somewhat clear at times.

19, 10.8 A.M. Yesterday cloudy day and evening, with a little snow.

20, 12.7 P.M. Yesterday mostly cloudy day and evening.

21, 11.2 A.M. Yesterday rather clear and cold; some thin clouds in the evening; no aurora seen.

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December 1885.

22, 10.9 A.M. Yesterday cloudy day and evening; a few snowflakes about noon.
23, 10.7 A.M. Yesterday rather clear and cool; evening cloudy.
24, 10.2 A.M. Yesterday rather cloudy and warm; evening cloudy.
24, 10.2 P.M. Day clear, becoming cooler; evening clear at first, thin clouds later; no aurora seen.
26, 11.2 A.M. Yesterday rather cloudy and cold; rather clear about sunset; evening cloudy.
27, 11.5 A.M. Yesterday cloudy and cold; a little snow in the evening.
28, 11.0 A.M. Yesterday rather cloudy and cold; evening mostly cloudy; clear this morning 1 to 2 A.M.
29, 11.5 A.M. Yesterday rather clear, thawing; evening clear at first, mostly cloudy after 9 P.M.; no aurora seen.
30, 12.2 A.M. Yesterday clear and cool day and evening; no aurora seen.
30, 11.5 P.M. Day and evening clear and cool; no aurora seen.
1886 Jan. 1, 11 A.M. Yesterday cloudy day and evening, with some rain.

Bar. max. 12, 9.6 A.M., 30.560, 34.4; min. 5, 10.0 A.M., 29.150, 39.7;
C. 13399, max., 11, 57.4; G. 2295, min., 8, 10.0.
Freezing point of No. 4, 3, 32.3.

Report to Signal Service, sent Jan. 1, 1886.

Aurora looked for every clear evening; results as follows:
Dec. 6. Low auroral arch during the evening, sky dark below.
Dec. 7. Faint auroral arch during the evening.

Zodiacal light visible 2, 3, 6, 7, 11, 28, 29, 30; observations on other evenings hindered by moonlight or clouds.

Usual report sent Jan. 1, 1886 to the New England Meteorological Society. Maximum readings referred to previous date as customary since June, 1885.

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General remarks on Observations for 1885.

Range of barometer and of temperature.

The highest and lowest (uncorrected) reading of the barometer for each month, with the corresponding reading of the attached thermometer, are given below. As the barometer was usually read only once or twice each day, these readings may differ considerably from the actual maxima and minima for the successive months. The highest reading, for each month, of the maximum thermometer (Casella 13399), and the lowest reading of the minimum thermometer (Green 2205), both uncorrected, are also given below. The times of observation are given in hours and tenths.

	Barometer								Temperature			
	Maxima.				Minima.				Max.		Min.	
	Date	Time	Barom.	Attached therm.	Date	Time	Barom.	Attached therm.	Date	C. 13399	Date	G. 2205
January	3	10.1 A.M.	30.719	23.0	17	10.3 A.M.	29.199	26.8	1	57.4	29	−4.8
February	24	9.9 A.M.	30.286	22.3	10	10.6 A.M.	28.944	33.0	11	46.8	12	−2.2
March	30	10.5 A.M.	30.422	31.9	2	10.1 A.M.	29.358	38.2	28	53.9	13	0.4
April	19	10.2 A.M.	30.488	45.1	29	9.8 A.M.	29.237	51.7	22	78.3	10	25.9
May	21	10.2 A.M.	30.312	58.6	2	10.2 A.M.	29.481	45.2	20	80.6	4	30.3
June	11	10.3 A.M.	30.249	62.4	8	10.4 A.M.	29.452	65.7	17	89.6	10	44.8
July	23	10.8 A.M.	30.250	74.7	1	10.2 A.M.	29.644	65.2	26	90.7	1	52.1
August	17	10.5 A.M.	30.261	68.0	14	10.5 A.M.	29.698	78.3	13	86.1	28	46.1
September	26	9.9 A.M.	30.350	54.1	23	10.2 A.M.	29.322	59.7	15	79.0	24	36.1
October	8	10.9 A.M.	30.327	49.0	30	10.4 A.M.	29.256	55.5	5	72.5	26	30.5
November	1	9.9 A.M.	30.310	42.0	25	10.0 A.M.	29.538	44.0	14	64.9	28	18.1
December	12	9.6 A.M.	30.560	34.4	5	10.0 A.M.	29.150	39.7	11	57.4	8	10.9

Range of barometer 30.719 Jan. 3 to 28.944 Feb. 10.

" " temperature 90.7 July 26 to −4.8 Jan. 1.

Observers. A. Searle usually; O. C. Wendell Feb. 23, 8.4 P.M.; Feb. 25, 10.8 P.M.; July 6, 10.4 A.M.; and the whole of September except for records

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made Sept. 1 to 4 inclusive, 15 at 9.6 A.M., 22 to 30 inclusive;
D. B. Ratt, Aug. 26, 27, 28, 29.

Times of Observation. The times of observation entered in the records apply to all observations entered on the corresponding lines. In general, one observation was made in the forenoon, another in the evening, if clear.

Manner of recording times. The times are ordinarily given in hours and tenths; Eastern Time, 5h slow of Greenwich, is employed. See page 155.

Instruments. Barometer J. Newman, No. 68; external thermometer No. 4; maximum thermometer Casella 13399; minimum thermometer Green's 2205; vane; rain gauge; all as described in book Q 5 just before the record for 1878. See also references given in the general remarks on the observations for 1882, book R 67, page 216.

Thermometer No. 4. See remarks just mentioned. The freezing point of the instrument was observed to be 32.3 on Feb. 27 and Dec. 3.

Wind recorded as in 1880; see book R 67, pp. 50, 51; also pencil memorandum on inside of cover of this book.

Reductions. See general remarks on observations of 1882, book R 67, p. 216. The reductions for 1885 were made largely by Miss I. C. Bond.

Reports. The results reported monthly to the U. S. Signal Service are also recorded in this book; see book R 67, p. 51. See also this book, foot of page 90. The final column of the second page of the record for each month has been filled, as before, with an abstract of observations relating to aurora, although this abstract is not now called for by the Signal Service.

For monthly reports made to the New England Meteorological Society, see pp. 143, 147, 152, 183.

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Notes on zodiacal phenomena.

See page 91 of this book for references to these phenomena up to the end of April, 1884. Later references as follows:

Observations of "Gegenschein" by A. Searle

1884 Oct. 13 ; observations also by O.C. Wendell and S.C. Chandler, Jr.
Oct. 15.
1885 Oct. 4. See also next book (R87) p. 200.
Oct. 9.
Nov. 3.

"Gegenschein" looked for, not seen

1884 Oct. 18
Oct. 23
1885 Feb. 17
Oct. 11
Oct. 14
Oct. 15
1886 Feb. 28
Mar. 4
Oct. 21
Oct. 22

Remarks on zodiacal bands

1884	Oct. 13	1886	Feb. 28	1887 Feb. 20
	Oct. 18		Oct. 23	Mar. 20
	Oct. 23		Oct. 24	1888 Feb. 15
1885	Feb. 17		Nov. 21	Mar. 17
	Oct. 11	1887	Feb. 12	Apr. 2
	Oct. 14		13	

Observations of "Gegenschein by E.E. Barnard and others

See pp. 69, 105, 137, 167.

See also pp. 74, 75, for experiments by A. Searle on effect of proximity of bright stars, not confirmed by O.C. Wendell nor by E.E. Barnard.

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Comparison of α and β Ursae Minoris
1884 Sept. 12, p. 134.

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