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KG
11366
v.714

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R 67

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
"	$5\frac{7}{8}$ "	0.001
"	$9\frac{7}{8}$ "	0.002
"	$13\frac{3}{4}$ "	0.003
"	$17\frac{5}{8}$ "	0.004
"	$21\frac{1}{2}$ "	0.005

Ar. co. log for reduction from gauge C 8.94575

Ar. co. log for reduction of snow measures:

With glass tube	$1\frac{7}{8}$ inches across inside	9.79770
" " "	$1\frac{8}{10}$ " " "	9.83315
" " "	$1\frac{13}{16}$ " " "	9.82714

{Names of clouds on Poëy's system}	{Abbreviations used here}
Cumulus	M
Pallio-cumulus	Pm
Tracto-cumulus	Tm
Cirrus	R
Pallio-cirrus	Pr
Cirro-stratus	Rs
Cirro-cumulus	Rm

P is used to denote clouds which may be considered as either Pm or Pr.

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

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Formulae 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)

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

Annual increase of west declination

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

Date	Computed west ded.	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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Harvard College Observatory.

Cambridge, Mass.

Meteorological Record for the years

1880, 1881, 1882.

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Monthly Rainfall in Eastern Mass. 1880.

	Rainfall in inches and hundredths												
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.
Lake Cochituate	3.07	4.05	2.83	2.94	2.03	1.25	7.00	3.81	1.69	2.95	1.70	2.56	35.88
Framingham	3.06	4.11	2.57	3.01	1.92	1.79	5.89	4.50	1.52	3.50	2.00	2.97	36.84
Southboro	3.265	3.86	3.37	3.145	1.935	2.16	6.515	4.56	1.53	3.745	1.775	2.88	38.74
Marlboro	3.975	4.06	2.945	3.23	1.935	2.555	6.91	3.54	1.69	3.875	1.90	2.75	39.365
Westboro	4.06	3.52	3.17	3.14	1.58	1.93	6.80	3.44	1.72	3.68	1.57	2.85	37.46
Hopkinton	3.47	4.35	3.52	3.00	1.81	1.74	5.25	4.00	1.56	3.90	1.68	2.69	36.97
Chestnut Hill Res.	2.95	4.36	2.82	2.41	1.71	0.72	6.14	2.52	1.75	3.08	2.23	2.27	32.96
Beacon Hill Res.	2.51	4.08	2.59	2.68	1.58	0.50	6.03	2.96	1.68	2.96	2.30	2.55	32.42
Mystic Lake	2.40	4.18	2.53	2.02	2.04	1.44	7.36	3.89	1.43	2.79	1.87	2.50	34.45
Mystic Station	2.83	4.28	2.45	2.34	2.00	1.54	7.11	3.38	1.42	2.60	1.94	2.50	34.39
Mystic Eng. Ho.	2.59	4.38	2.57	1.96	1.90	0.89	7.21	3.60	1.50	2.65	1.965	2.31	33.525
Waltham, Boston Man. Co	3.31	2.56	3.16	2.20	1.48	0.96	6.84	3.80	1.40	3.00	1.24	1.78	31.73
Cambridge	3.79	4.20	3.28	2.00	1.51	0.80	6.75	3.49	1.71	2.78	2.10	2.81	35.22
Boston, Supt. Sewers	3.23	4.73	3.85	3.28	1.86	0.63	7.52	2.87	2.30	3.41	2.07	3.14	38.89
Boston, U.S. Signal Ser	3.72	4.11	3.25	2.85	1.63	0.75	6.86	2.90	2.36	3.15	2.30	3.42	37.30
Lowell, Mer. Man. Co.	4.12	3.18	3.08	2.28	2.54	1.82	6.52	3.00	1.60	2.62	1.88	2.64	35.28
Lowell Locks & Canals Co.	4.36	3.94	3.00	2.38	2.68	1.70	6.52	3.16	1.54	2.82	1.84	2.58	36.52
Averages	3.34	4.00	3.00	2.63	1.89	1.36	6.66	3.50	1.67	3.15	1.90	2.66	35.76

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1880

Time	Barom.	Att. therm.	No. 4	Max. unset	Max. set	Min. unset	Min. set	Rainfall
Jan. 1, 9 A.M.	30.182	23.2	19.1	19.3	19.7	7.3	18.2	See snow memoranda
2 — " —	29.898	31.6	38.6	38.4	37.9	18.3	38.0	0
3 — " —	30.456	32.3	23.7	~~45.5~~ 23 A	24.3 23.1	~~33.1~~ 23.5	~~33.1~~ 24.3	0
4 — " —	30.157	34.5	40.9	40.3	40.0	23.0	39.9	0
5 — " —	30.377	38.0	36.0	49.2	36.0	33.2	35.5	0
6 — " —	30.531	34.2	25.8	40.0	26.8	24.2	25.3	0
7 — " —	30.330	35.2	33.9	35.2	33.7	25.1	33.2	4¼
8 — " —	30.362	33.5	24.3	39.6	25.5	21.8	23.8	0
9 — " —	30.280	36.3	33.0	39.0	33.0	23.8	32.3	6
10 — " —	29.940	37.1	39.3	39.2	39.2	32.2	39.0	1.
11 — " —	30.462	35.0	25.0	46.3	26.0	22.7	24.3	0
12 — " —	30.080	40.4	48.7	48.3	47.0	24.5	47.2	0
13 9¼ A.M.	30.174	35.8	21.9	52.6	28.3	21.4	21.4	See p. 5
14 9 A.M.	30.467	26.0	7.7	23.5	11.0	5.0	7.1	
15 — " —	30.208	28.4	20.2	23.4	21.5	7.1	19.8	0
16 — " —	30.233	32.1	26.7	37.6	27.2	19.7	26.0	0¼
17 — " —	30.104	34.2	34.0	34.7	34.0	26.0	33.5	0
18 — " —	29.812	36.4	34.5	42.0	34.8	33.0	34.0	0
19 — " —	29.770	37.0	38.7	38.2	38.3	33.6	37.4	0¼
20 — " —	29.810	37.4	33.7	42.4	34.0	30.5	33.1	0½
21 — " —	29.710	33.3	25.2	38.2	26.0	23.5	24.7	6¾
22 — " —	30.074	29.0	17.4	27.0	19.0	14.0	17.0	0
23 — " —	29.437	38.9	39.0	47.3	39.2	17.0	38.6	4¼
24 — " —	29.865	37.0	34.7	44.0	34.9	28.9	34.0	0
25 — " —	30.109	33.1	25.4	37.5	26.3	22.0	24.7	0
26 — " —	30.170	34.3	29.4	35.8	29.8	24.8	28.7	0
27 — " —	30.190	36.2	33.0	45.8	33.8	27.0	32.6	0
28 — " —	29.736	39.7	39.6	40.7	39.3	32.3	39.0	5
29 — " —	30.312	38.4	28.0	56.1	29.0	27.1	27.1	0
30 — " —	30.640	28.5	17.5	29.2	19.0	11.2	17.0	0
31 — " —	29.716	43.0	43.1	42.3	42.3	17.0	42.2	0¾
9.0	933.592 / 30.117 / 30.061	1070.0 / 34.5	938.2 / 30.3	1218.6 / 39.3	Mean set inside 6 inches	700.3 / 22.6	917.9 / 29.6	Rainfall in all 3.794 inches

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Remarks

{ 10 A.M. Depth of snow 5, 5, 5½, 4, 4, 4½, 5, 4, 5, 5; mean 4.7 inches. 14½ inches in cylinder 1⅞ inches across weigh 4 oz.
Gauge cleared out. Hence rainfall to 1 inch of snow 0.1731 inches; total rainfall 0.814 inches.

{ 9 A.M. Yesterday mostly clear and cool. This morning cloudy and thawing, wind S.W.

{ 9 A.M. Cleared off about 10 A.M. yesterday; rest of day clear and warm. This morning clear, wind N.W. 8½ P.M. Day cool and clear till 7 P.M., then cloudy.

9 A.M. Thin clouds, wind S.W.

9 A.M. Yesterday mostly cloudy and mild, with a few drops of rain about 6 P.M.; stars somewhat visible late in the evening. This morning nearly clear, with light west wind. 8 P.M. Day nearly clear, cool.

9 A.M. Morning cloudy, wind N., light. 7 P.M. Day cloudy, with frequent rain & a little hail.

9 A.M. Mostly clear.

{ 9 A.M. Yesterday clear and rather warm. This morning clear, with white frost.
6½ P.M. Day clear and mild.

{ 9 A.M. Haze about 7 P.M. yesterday, and fog later in the evening. This morning cloudy, with moderate N.E. wind.

{ 9 A.M. Yesterday cloudy throughout, with a little drizzling rain. This morning clear, with light S.W. wind.

{ 9 A.M. Yesterday clear and rather warm. This morning nearly clear and calm.

{ 9 A.M. Yesterday clear and mild. Clouded over about 6 P.M. This morning cloudy and warm, wind S.W.

{ 9½ A.M. Yesterday cloudy and warm. Rain after 5 P.M., changing to snow about 9 P.M. This morning cloudy, snowing. 7½ P.M. Day snowy, clearing off about 5 P.M.
5 P.M. This morning and most of the day nearly clear and calm. Some clouds in the forenoon.

9 A.M. Thin clouds.

9 A.M. Yesterday cloudy and thawing. A little snow about 7 P.M.; somewhat clear about 9 P.M. and 10½ P.M. This morning cloudy with light north wind.

9 A.M. Yesterday cloudy, somewhat clear at times in the evening. This morning cloudy, calm.

9 A.M. Yesterday cloudy and thawing, somewhat clear at times in the evening. This morning foggy.

9 A.M. Yesterday cloudy and thawing, with a little rain at times. This morning clear.

9 A.M. Yesterday nearly clear and rather warm. This morning cloudy, wind N.E., light, mixed snow and rain.

{ 9 A.M. Yesterday cloudy with rain. This morning nearly clear, wind N.W., light.
7½ P.M. Day clear, growing colder.

{ 9 A.M. Yesterday clear till 11 P.M. This morning cloudy, with light N. wind.

{ 9 A.M. Yesterday cloudy, with rain after 6 P.M. This morning foggy and raining now clearing. 10½ P.M. Day warm, alternately clear and cloudy; a few drops of rain after 9 A.M.

9 A.M. Mostly cloudy. 11½ P.M. Day and evening mostly clear and cool.

9 A.M. Partly cloudy, calm.

{ 9 A.M. Yesterday mostly clear, some clouds about 9 P.M. This morning hazy with some clouds, calm. 6½ P.M. Day somewhat hazy and warm.

9 A.M. Yesterday clear till 11 P.M. This morning cloudy.

9 A.M. Yesterday cloudy and warm, with occasional showers. This morning cloudy, now clearing.

9 A.M. Yesterday mostly somewhat cloudy and warm; evening hazy, rather clear. This morning mostly clear, with fresh N.W. wind.

{ 9 A.M. Yesterday clear and rather cold. This morning cloudy, nearly calm.
10 P.M. Day cloudy, growing warm.

{ 9 A.M. Wind high in the night, with a little rain. Apparently now beginning to clear up.

Jan. 1, 0.814; Jan. 7 0.375; Jan. 10, 0.088; Jan. 13 14 0.951; Jan. 16 0.928; Jan. 18 20 0.462; Jan. 23 0.375; Jan. 28 2441; Jan. 31, 0.066

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Jan. 1, 1880, 6 to 6¼ P.M. Tried the 3-foot telescope on α Lyrae, with the lowest of the two selected eyepieces. Telescope not sufficiently steady to allow accurate adjustment of focus by hand. Seeing such as would be called 7, 7.5 in the large telescope; but the effect of imperfect focus would enlarge and steady the image. Observation made from north balcony of dome.

Note Feb. 6 1880. There is no record with regard to aurora Jan. 1, but if any had been present, it would have been noticeable from the north balcony.

Jan. 2, 1880, 6 P.M. Repeated observation of yesterday in same place. Seeing about the same. Telescope unsteady, as yesterday. Later in the evening it was blown off the balcony, and lost its finder and eye-piece.

At 10½ P.M. barometer 30.020; att. therm 39.8; No. 4, 40.2. No aurora.

Jan. 3, 1880, 8⅓ P.M. Bar. 30.527, att. therm. 34.0 Cloudy. No. 4, 26.1

Jan. 5, 1880, 8⅙ P.M. Bar. 30.549, att. therm. 37.9 No. 4 28.9. No aurora. Zodiacal light bright about 6½ P.M., joining south branch of Milky Way as usual. Less bright now.

Jan. 8, 1880. 6½ P.M. Bar. 30.241; att. therm 39.9; No. 4, 33.3 Zodiacal light distinct this evening and yesterday; no aurora. 7 P.M. Becoming hazy.

Jan. 10, 1880. 7 P.M. Bar. 30.275; att. therm. 43.0 No. 4, 38.1 Zodiacal light distinct 6½ to 7 P.M.; no aurora. 10½ P.M. Bar. 30.374; att. therm. 40.3; No. 4, 31.7. No aurora.

Jan. 13, 1880. 7½ P.M. Bar. 30.290; att. therm 31.7 No. 4 14.3 Zod. light visible at first. No aurora.

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Jan. 14, 1880, 5 P.M. No snow fallen during the past 24 hours. Snow of Jan. 12 and 13 measured in 10 places: 4, 5, 5½, 4, 3¾, 5¼, 5¼, 5½, 5, 4; mean 4.725 inches; 19 inches of this snow in cylinder 1⅞ inches across weigh 5½ ounces. The gauge contains 2 3/11 ounces of water and 1½ ounces of ice. The water must be melted snow; part and perhaps all the ice is due to the rain of Jan. 12 previous to the snow. 7½ P.M. Bar. 30.374; att. therm. 32.0; No. 4, 19.2. No aurora; zodiacal light not certainly visible; moon above horizon. 8 P.M. Zodiacal light now visible; moon not quite set.

Nb, Feb. 10, 1880. Hence rainfall to 1 inch of snow 0.1734 inches: total rainfall 0.819 inches. If the ice in the bottle is considered as wholly due to the rain, this amount to be added is 0.132, making 0.951.

Jan. 16, 1880, 8½ P.M. Bar. 30.140; att. therm. 34.9; No. 4, 32.3. Rather cloudy, especially near horizon.

Jan. 19, 1880. 9⅙ P.M. Bar. 29.834; att. therm. 41.8; No. 4 35.0. No aurora or zodiacal light; moonlight, clear.

Jan. 21, 1880. 7¼ P.M. Bar. 29.978; att. therm. 34.2; No. 4, 22.1 No aurora or zodiacal light seen; moonlight, clear.

Jan. 23, 1880, 10⅓ P.M. Bar. 29.689; att. therm. 40.1; No. 4, 35.8. No aurora or zodiacal light seen; moonlight, frequent clouds.

Jan. 24, 1880, 11¼ P.M. Bar. 30.065; att. therm. 36.5; No. 4, 26.8. Evening clear, moonlight; no aurora or zodiacal light seen.

Jan. 25, 1880, 7¼ P.M. Bar. 30.082; att. therm. 39.1; No. 4, 31.2 Nearly clear, moonlight; no aurora or zodiacal light seen; some clouds in the N.

Jan. 26, 1880, 6¾ P.M. Bar. 30.212; att. therm. 43.0; No. 4, 37.3. Nearly clear, moonlight; no aurora or zodiacal light seen.

Jan. 28, 1880, 7½ P.M. Bar. 29.930; att. therm. 47.7; No. 4, 42.5 Moonlight, some clouds and haze; no aurora or zodiacal light seen.

Jan. 29, 1880, 7¼ P.M. Bar. 30.662; att. therm. 33.7; No. 4 16.6. Clear; zodiacal light conspicuous; no aurora seen.

Jan. 30, 1880, 6 P.M. Bar. 29.979; att. therm. 35.1; No. 4, 46.0. Cloudy; a few drops of rain.

Jan. 31, 1880, 7½ P.M. Bar. 29.750; att. therm. 40.2; No. 4, 32.0. Clear;

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February, 1880.

Date and time	Barom.	Att. Therm.	No. 4	Minimum wet & act	Maximum wet & act	Gauge	Wind	Clouds
1, 9 A.M.	29.656	34.0	26.8	22.2 26.1	51.0 28.3	0	2 SW	8 Rm 7m →
2, —"—	30.384	20.2	−0.1	−2.9 −0.1	35.0 3.8	0	3 NW	0
3, 9½ A.M.	29.731	25.7	29.0	−0.2 28.2	28.7 28.8	(See remarks)	*5 E	10 P; snowing
4, 9¼ —"—	29.616	24.3	19.3	14.5 18.3	32.0 20.1	A.8	2 W	0
5, 9 —"—	30.195	26.8	15.7	11.0 15.2	26.5 17.2	0	0 calm	9 P 7m /
6, 9 —"—	30.148	29.5	28.6	15.2 27.9	29.6 28.8	0	2 W	6 P Rs 7m →
7, 9¼ —"—	30.205	28.0	18.5	11.3 17.6	33.0 19.5	0	0	9 P 7m →
8, 9 —"—	30.436	27.1	14.8	10.3 14.2	29.3 16.7	0⅛	1 W	0
9, 9 —"—	29.828	31.8	32.6	14.2 32.1	32.5 32.5	0	3 W	0 P M 7m
10, 9 —"—	30.380	20.4	0.2	−3.9 0.2	32.7 4.0	0	1 NW	4 P Rs
11, 9 —"—	30.306	28.0	20.7	0.2 20.0	30.5 21.7	0½	0 calm	0 haze
12, 9¼ —"—	29.759	33.0	41.2	20.0 39.8	40.6 38.0	1¼	3 S	10 Rm 7m //
13, 9 —"—	29.626	40.8	43.3	39.0 43.0	46.3 43.3		0 calm	10 P fog; raining
14, 9 —"—	29.502	40.8	44.8	37.3 44.0	44.3 44.3	14	2 SW	1 Rm 7m /
15, 9 —"—	30.037	37.3	32.6	29.7 32.1	46.4 33.2	0	1 E	10 P; a little sleet
16, 9 —"—	30.204	32.7	29.6	25.7 28.9	33.3 30.0	0⅜	1 W	0 Rs 7m
17, 9¼ —"—	30.550	33.4	32.5	25.0 32.1	38.5 32.7	0	1 S	3 P Rs haze
18, 9 —"—	30.170	40.6	46.1	32.1 45.1	48.0 45.1	0	2 SW	10 P Rm 7m //
19, 9¼ —"—	29.956	37.2	29.0	28.3 28.3	58.7 29.6	1⅛	4 W	0 7m
20, 9 —"—	30.304	23.1	16.8	13.1 16.0	29.9 17.8	0	3 NW	0
21, 9 —"—	29.805	30.0	31.5	16.0 31.0	31.0 31.0	0	2 SW	10 P
22, 9¼ —"—	29.818	32.6	31.0	24.9 30.4	38.2 31.3	0	2 SW	0 P Rs
23, 9 —"—	29.470	35.8	35.1	28.2 34.8	38.7 35.3	0	2 SE	10 P; snowing
24, 9 —"—	29.910	28.0	20.0	17.1 19.5	38.0 21.2	4¼	3 N	0
25, 9 —"—	30.073	29.5	25.8	18.5 25.2	31.3 26.4	0	0 calm	5 P 7m
26, 9 —"—	29.834	37.1	41.5	25.2 40.8	40.8 40.9	0	1 E	10 P
27, 9¼ —"—	30.050	37.2	37.4	30.0 36.8	45.3 37.0	1	1 NW	1 P haze
28, 9 —"—	30.192	40.3	36.9	31.3 36.2	56.0 37.0	0	1 NE	6 P Rs haze
29, 9 —"—	29.524	46.2	51.5	36.2 53.0	53.9 52.2	6⅞	2 SW	10 P 7m //
9.1	869.699	931.4	835.7	569.5	816.7	1120.0	Mean. set inside building	Total rainfall 4.20 inches.	47 (omitting the record Feb. 3 to be 2.) 1.6	142 4.9
	29.990	32.1	28.8	19.6	28.2	38.6				
	.009									
	29.981									

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9 A.M. Yesterday rather cloudy at first, afternoon and evening clear. 7 P.M. Day variable and windy with snow squalls from the west, but mostly clear.

9 2/3 P.M. Day clear and cold.

9 1/2 A.M. Heavy snowstorm.

* Note Feb. 10. The velocity of the wind estimated 5 miles an hour instead of by the scale of 10 adopted here.

{9 1/2 A.M. Yesterday windy and snowing. This morning clear as early as 3 A.M. 7 1/2 P.M. Day clear, with a few passing clouds; rather cold.}

9 A.M. Yesterday clear, cool, growing hazy after 7 P.M.

9 1/2 A.M. Yesterday clear, cool; evening slightly hazy. 7 1/2 P.M. Cloudy most of the day, with a little snow. Somewhat clear after 6 P.M.

Feb. 8, 9 A.M. Yesterday evening cloudy and clear by turns. 10 1/2 P.M. Today clear and cool.

Feb. 9, 9 1/2 P.M. Day clear, wind diminishing, cold increasing.

Feb. 10, 8 1/2 P.M. Day growing cloudy and milder, with snow after 7 P.M.

Feb. 11, 9 1/2 A.M. Snow ceased about 10 P.M. yesterday. 10 2/3 P.M. Day rather clear; haze increasing in the evening.

Feb. 12, 9 1/2 A.M. Cloudy at midnight; rain early. 9 1/2 P.M. Day cloudy with a few drops of rain. Evening hazy, calm.

Feb. 13, 8 P.M. Foggy all day, with some rain.

Feb. 14, 9 A.M. Rain rather heavy late yesterday evening. 8 P.M. Day mostly clear and mild. Evening somewhat hazy.

Feb. 16, 9 A.M. Yesterday cloudy with a little snow. 8 1/2 P.M. Day clear, cool.

Feb. 17, 8 1/2 P.M. Day mostly clear and warm.

Feb. 18, 9 A.M. Yesterday evening partly clear, with passing clouds from the N.W.; surface wind S. 8 1/2 P.M. Today cloudy.

Feb. 19, 9 1/2 A.M. Yesterday evening cloudy and windy, with some rain.

Feb. 20, 8 1/2 P.M. Yesterday evening clear, cold, windy. Today rather clear and cool.

Feb. 21, 10 1/2 P.M. Yesterday evening somewhat cloudy. Today cloudy with a little more rain; evening clear.

Feb. 22, 8 3/4 P.M. Day clear cool; clouded up at about 8 P.M.

Feb. 23, 9 A.M. Partly clear at 10 1/2 P.M. yesterday. 9 1/2 P.M. Day cloudy, windy, with some and rain; evening windy, often clear.

Feb. 25, 9 A.M. Yesterday clear and cool.

Feb. 26, 9 A.M. Yesterday cloudy, chilly, both day and evening.

Feb. 27, 9 1/2 A.M. Yesterday cloudy and rather warm, with a little rain.

Feb. 28, 9 A.M. Yesterday warm and nearly clear.

Feb. 29, 9 A.M. Yesterday cloudy and warm; some rain in the evening and following night.

March 1, 9 1/2 A.M. Yesterday cloudy and warm; somewhat clear afternoon and near zenith late in the evening.

Rainfall; Feb. 4, 1.599; Feb. 8, 0.011; Feb. 11, 0.044; Feb. 12, 0.110; Feb. 14, 1.236; Feb. 16, 0.033; Feb. 19, 0.099; Feb. 24, 0.375; Feb. 27, 0.088; Feb. 28, 0.007; Feb. 29, 0.203; in all

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February, 1880.

Feb. 1, 7 P.M. Bar. 29.900; att. th. 32.4; No. 4, 17.3; Clear, rather windy; Zodiacal light visible, not bright; no aurora.

Feb. 2, 9 2/3 P.M. Bar. 30.322; att. therm. 25.1; No. 4, 9.5. No aurora; Zodiacal light distinct 6 1/2 to 8 P.M.

Feb. 3, 4 P.M. Bar. 29.059; att. therm. 29.9; No. 4, 32.0. Snowstorm.
6 1/2 " " 28.974; — " — 30.9; — " —, 31.3. — " —.
Wind rather high from the E. & N.E. all day.

7 25	29.050	att. therm.	31.1	No. 4 18.3
8 45	29.118		30.7	15.8
10 15	29.220		29.0	15.6

Feb. 4 10 2/3 A.M. Snow measured in 10 places; 10, 8 3/4, 6 3/4, 6 1/2, 7, 9 3/4, 9, 6 3/4, 6 1/2, 7 1/4; mean 7.825 inches. 21 1/2 inches of this snow in cylinder 1 7/8 inches across weigh 7 ounces. Gauge cleared out. } Hence rainfall to 1 inch of snow 0.2044 inches; total rainfall 1.599 inches.

7 1/6 P.M. Bar. 29.886; att. therm. 29.8; No. 4, 22.7. Clear; zodiacal light visible; no aurora.

Feb. 5, 7 P.M. Bar. 30.223; att. therm. 30.9; No. 4, 23.1; Clear; zodiacal light visible, not bright; no aurora.

Feb. 6, 6 2/3 P.M. Bar. 30.154; att. therm. 32.1; No. 4, 27.3

Feb. 7, 9 1/4 P.M. Zodiacal light visible at 7 1/2 P.M. yesterday; no aurora.

7 1/4 P.M. Bar. 30.100; att. therm. 30.9; No. 4, 24.0. Hazy; zodiacal light somewhat visible; no aurora seen.

Feb. 8, 10 1/2 P.M. Bar. 29.988; att. therm. 31.7; No. 4, 25.0. Clear; zodiacal light distinct at 7 1/2 P.M., still slightly visible; no aurora.

Feb. 9, 9 1/2 P.M. Bar. 30.348; att. therm. 26.0; No. 4, 5.0; Clear; zodiacal light visible at 8 P.M., still slightly visible; no aurora.

Feb. 10, 8 1/4 P.M. Bar. 30.019; att. therm. 27.8; No. 4, 25.4. Snowing.

Feb. 11, 10 2/3 P.M. Bar. 30.264; att. therm. 33.6; No. 4, 25.8. Hazy; no aurora or zodiacal light at 7 P.M. or now.

Feb. 12, 9 1/2 P.M. Bar. 29.664; att. therm. 40.3; No. 4, 43.5. Evening hazy with some stars occasionally visible; no aurora or zodiacal light seen.

Feb. 13, 8 P.M. Bar. 29.588; att. therm. 41.3; No. 4, 42.4. Foggy.

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Feb. 14, 8 P.M. Bar. 29.977; att. therm. 40.6; No. 4, 32.5; mostly cloudy; light N. wind. Nearly clear at 7½ P.M., moonlight; no aurora or zodiacal light seen. Clouds came on from the east about 7¾ P.M.

Feb. 16, 8½ P.M. Bar. 30.456; att. therm. 38.9; No. 4, 32.2. Clear, moonlight; no aurora or zodiacal light.

Feb. 17, 8½ P.M. Bar. 30.342; att. therm 42.0; No. 4, 41.6. Moonlight & passing clouds; no aurora or zodiacal light seen.

Feb. 18, 8½ P.M. Bar. 29.762; att. therm. 47.4; No. 4, 52.7; wind 4, SW; clouds 10, raining. At 6 P.M. there was much rapid scud from the S.W. (Fm 11).

Feb. 19, 8 P.M. Bar. 30.038; att. therm. 27.4; No. 4, 22.1; wind 4, NW; clouds 1 Fm ∅ // Moonlight; no aurora or zodiacal light.

Feb. 20, 8½ P.M. Bar. 30.250; att. therm 30.3; No. 4, 23.3; nearly calm, moonlight & thin clouds; no aurora or zodiacal light seen.

Feb. 21, 10½ P.M. Bar. 29.600; att. therm. 34.3; No. 4, 30.7; moonlight, clear; no aurora or zodiacal light seen now or earlier.

Feb. 22, 8¾ P.M. Bar. 29.800; att. therm 39.3; No. 4, 30.7. Clear, with moonlight; at 7½ P.M. no aurora or zodiacal light then seen; clouded over 8 to 8½ P.M.

Feb. 23, 9¼ P.M. Bar. 29.550; att. therm. 36.4; No. 4, 32.0; wind 4, NW; clouds 2, P, Fm; moonlight; no aurora or zodiacal light seen.

Feb. 24, 11 P.M. Bar. 30.088; att. therm. 33.0; No. 4, 23.1; evening clear, moonlight; no aurora or zodiacal light seen.

Feb. 27, 7 P.M. Bar. 30.106; att. therm. 49.4; No. 4, 48.3; clear & fine somewhat hazy; zodiacal light distinct; no aurora.

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March, 1880.

Date and time	Barom.	Att. Therm.	No. 4	Minimum, unset	Minimum, set	Maximum, unset	Maximum, set	Gauge	Wind	Clouds.
1, 9 A.M.	29.900	41.8	35.1	33.8	34.6	60.6	35.4	0	2 NW	0 Rs Fm
2, 9 A.M.	30.209	32.1	28.7	23.5	28.0	39.3	29.2	0	2 NW	3 Rs Fm ↘
3, 9¼ A.M.	30.299	32.6	34.0	22.3	33.3	37.5	34.2	0	1 S	6 P Rs Fm ↘
4, 9 A.M.	29.639	47.8	51.8	33.4	51.0	51.4	51.4	2½	2 W	7 M Fm →
5, 9¼ A.M.	29.353	47.0	50.3	41.4	49.0	58.3	49.0	See p. 12	2 S	10 Rn Fm ↑; raining
6, 9 A.M.	29.910	45.8	35.2	33.8	35.0	65.6	36.3	0	2 NW	10 P Fm
7, 9 A.M.	30.306	35.7	32.5	26.9	32.0	38.8	33.0	0	1 N	10 P Fm
8, 9¾ A.M.	29.996	40.2	33.8	31.2	33.3	40.3	34.5	3½	2 N	1 Fm ↘↘
9, 9 A.M.	30.278	28.7	17.9	13.8	17.3	34.7	19.3		1 NE	10 P; snowing
10, 9 A.M.	29.843	31.2	27.9	17.2	27.2	28.2	28.4	1	1 SW	10 P
11, 9 A.M.	30.258	29.0	18.6	15.8	18.1	40.0	20.0	0	1 N	10 P
12, 9 A.M.	30.257	30.8	24.6	18.0	24.2	25.0	25.3	See p. 12	1 SW	3 P Rs Fm haze
20, 10¾ A.M.	29.790	33.7	35.3	15.8	34.6	39.6	35.5	See p. 12	1 W	0 haze
21, 10¼ A.M.	29.893	36.6	37.4	27.2	36.3	41.9	37.2	1¼	2 N	0 Fm
22, 9 A.M.	29.925	34.6	34.8	24.7	33.0	42.3	34.4	0	1 SW	2 Rs Fm
23, 9¾ A.M.	29.876	39.0	38.7	29.7	37.8	49.0	38.3	0	1 SW	0 Rs Fm
24, 9¾ A.M.	29.497	40.0	37.0	33.0	36.4	50.0	37.0	0	3 NW	2 Fm
25, 9¾ A.M.	29.833	22.3	19.6	14.2	19.0	37.0	20.2	0	4 NW	5 Rs Fm
26, 10¼ A.M.	30.181	27.0	28.5	18.7	28.0	30.6	28.8	0	3 NW	0
27, 10¾ A.M.	30.024	32.8	36.4	23.2	35.9	36.0	36.0	0	1 S	7 P Fm
28, 10¼ A.M.	29.364	35.8	32.3	31.3	32.0	37.8	32.7	See p. 13	2 NE	10 P; snowing
29, 10¼ A.M.	29.755	34.1	32.8	24.2	32.1	32.7	32.8	1	2 N	9 P
30, 9 A.M.	29.891	33.1	31.3	26.8	30.4	34.8	31.5	0	2 NE	0 Rs Fm
31, 9 A.M.	29.750	32.4	34.5	26.2	34.0	36.0	34.3	0	2 N	1 P Rs
9.5	718.027 29.918	844.1 35.2	789.0 32.9	606.1 25.3	772.5 32.2	987.4 41.1	Maximum set inside building	Rainfall 3.28 in	42 1.8	116 4.8

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March, 1880.

Date and time	Bar.	Att. Therm.	No. 4	Wind	Clouds	Aurora	Zod. light
1, 9½ P.M.	30.050	41.2	32.2	2 NW	5 P 7m	None	Cloudy
2, 8 P.M.	30.326	37.4	30.4	1 N	0 7m	None	Distinct 7½ P.M.; less to-nnw.
4, 10 P.M.	29.754	52.3	48.8	0 calm	4 P haze	None	Distinct 8 to 9 P.M.
5, 9½ P.M.	29.444	54.0	47.5	3 N	0 haze	None	Distinct 7½ to 8 P.M.
8, 8¼ P.M.	30.246	30.1	20.8	2 NW.	0	None	Distinct
10, 10¼ P.M.	30.094	34.5	25.3	2 NW	0	None now on at 7¾ P.M.	Distinct at 7¾ P.M.
29, 11 P.M.	29.841	35.9	28.7	0	9 P	None seen at any time	None seen at any time
31, 10¼ P.M.	29.755	39.0	37.1	1 N	8 P	Clear at times during evening; no aurora	Cloudy

Rainfall; March 4, 0.221; 5, 0.309; 8, 0.309; 10, 0.088; 12, 0.272; 18, 0.640; 20, 0.335; 21, 0.110; 28, 0.905; 29, 0.088; total 3.277 inches.

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March, 1880.

1, 9½ P.M. Day at first clear, cool; clouds increasing; evening mostly cloudy, rather clear at times.

2, 8 P.M. Day rather cloudy, cool; evening nearly clear.

3, 9½ A.M. Yesterday evening still clear at 10½ P.M.; no aurora.

4, 9 A.M. Yesterday cloudy and rather warm, with some rain in the evening.

4, 10 P.M. Day cloudy and warm; evening rather clear, with occasional clouds and streaks of haze. At 8½ P.M. γ Arietis and ξ² Ceti on Morite borders of zodiacal light. No aurora seen at any time.

5, 9¼ A.M. Raining early this morning. 2 P.M. Bar. 29.144; att. tem. 49.2 No. 4 63.0; gauge 3½ (0.309 inches). Cleared off during the forenoon.

9½ P.M. Windy with some flying clouds in the afternoon & evening.

7, 9 A.M. Yesterday cool and cloudy; rather clear at 11 P.M.

8, 9¾ A.M. Yesterday cloudy and cool with a little snow after 7 P.M. This morning cloudy, clearing off about 8 A.M.

8, 10 P.M. No. 4, 17.4. Day clear, growing rather cold. Evening clear; no aurora at this time or earlier.

9, 9 A.M. Little snow as yet; snow of March 7 gone.

10, 9 A.M. Yesterday cloudy with a little snow. Apparently beginning now to clear up.

10, 10½ P.M. Cloudy till about noon, afterwards clear and rather cold.

12, 9 A.M. Yesterday cloudy with snow after about 10 A.M. This morning snowing about 8 A.M., clearing off.

12, 11½ A.M. Snow 2 inches deep, nearly uniform; 15 inches in cylinder 1⅞ inches across inside weigh 3¼ ounces. Gauge 2¼ ounces. Somewhat cloudy with a very little fine snow for a few minutes.

{Hence rainfall to 1 inch of snow 0.136 inches; total rainfall 0.272 inches; this result preferred to that by gauge (0.199 inches).}

18, 1½ P.M. Found 7¼ ounces of water in gauge. (0.640 inches.)

20, 10½ P.M. Snow measures: 2¼, 2½, 2¾, 2½, 2, 2¼, 2¼, 2½, 2, 2¾; mean 2.37 inches in cylinder 1½ inches across weigh 4½ ounces. Gauge 3½ ounces, (0.309 inches). Morning clear, cool.

{Hence rainfall to 1 inch of snow 0.1412 inches; total rainfall 0.335 inches. This result preferred to that by gauge.}

21, 4½ P.M. Some wind and snow during preceding night. About 1 inch on the ground this morning. Rainfall measured by gauge only (see p. 10). Day rather cloudy, [illegible]

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1880 March 12– 8 P.M. Partly clear; Zodiacal light (two paths); no aurora.

13. 9 A.M. Cloudy with a little snow.

13. 6 P.M. Cloudy.

14. 6 P.M. Day cloudy with a little snow & rain

15. 6 P.M. Day mostly cloudy.

16. 6 P.M. Day cloudy with ~~snow~~ rain

No zodiacal light or aurora seen this evening since March 12. Evening all partly or wholly cloudy.

17. 10½ P.M. Day mostly cloudy

Evening partly clear, moonlight.

No aurora or zodiacal light.

18. 9 P.M. Day clear, cool; cloudy towards night; evening clear

19. 7 P.M. Cloudy with snow, all day. Little snow in evening

20. 10 P.M. Clear & cool, occasionally somewhat cloudy. No zodiacal light or aurora; moonlight.

The record pasted in above was made at 12 Madison St., Cambridge, March 12 — 20, 1880.

22, 9 A.M. Yesterday evening clear; moonlight. No aurora or zodiacal light.

23, 9¾ A.M. Yesterday rather cloudy; evening clear; moonlight; no aurora or zodiacal light.

24, 9¾ A.M. Yesterday clear and rather warm; evening cloudy with S. wind

25, 9¼ A.M. Yesterday mostly cloudy. Strong N.W. wind towards night with a few snowflakes.

26, 10¼ A.M. Yesterday clear, windy. Moonlight; no aurora or zodiacal light seen.

27, 10¼ A.M. Yesterday clear, cool. Moonlight; no aurora or zodiacal light seen

28, 10¼ A.M. Yesterday cloudy with snow towards night. Snow measured; 4, 4, 3¾, 4, 4¼; mean 4 inches; 21½ inches in cylinder 1¾ inches across weigh 7½ ounces; 21½ ounces from another place 8 ounces; mean 7¾ ounces. Gauge cleaned out. (Hence rainfall to 1 inch of snow 0.2262 inches; total rainfall 0.905 inches)

29, 10¼ A.M. Yesterday cloudy with a little snow. 11 P.M. Today cloudy with a few snowflakes. Some stars visible in the evening especially about 10 P.M.

31, 9 A.M. Yesterday mostly clear, evening somewhat cloudy. No aurora or zodiacal light seen.

10¼ P.M. Day rather cloudy. Evening partly clear, cloudy in the west and at times in the north.

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April, 1880.

Date	Time A.M.	Barom.	Att. Therm.	No. 4	Minimum unset	Minimum set	Maximum unset	Maximum set	Gauge.	Rainfall in inches	Wind.	Clouds.
1	9½	29.898	37.3	40.7	32.3	39.7	43.2	40.2	0		2 N	0 Rs
2												
3	9½	30.192	44.2	47.5	29.7	46.8	53.5	46.8	2¼	0.199	3 S	10 Rm Fm 7m H; raining
4	9½	29.799	51.0	57.4	46.4	56.8	58.9	56.0	3½	0.309	3 S	10 Rm
5	9	29.548	53.9	55.0	51.8	54.3	66.3	54.6	0⅛	0.011	2 W	9 P Rs Rm Fm —
6	9½	29.760	47.0	45.7	37.3	45.2	60.2	45.8	0		2 NW	10 Rm Fm
7	9	29.684	40.0	36.6	31.2	35.9	53.9	36.7	0⅜	0.033	3 NW	5 R M Fm
8	9½	30.150	33.0	29.2	22.1	28.3	39.2	29.2	0		2 NW	0 7m
9	9	30.006	37.0	36.3	26.1	35.8	40.2	36.4	0		2 W	0 7m
10	9	29.682	42.2	49.0	35.7	47.9	49.7	47.6	0		3 SW	5 P 7m — haze
11	9	29.378	46.6	44.0	40.2	43.2	60.8	44.0	0		3 W	0 P Rs 7m
12	9	29.815	32.7	28.8	23.2	28.2	49.0	29.2	0		3 NW	0 7m
13	9	29.845	38.2	42.5	28.2	41.8	42.1	42.0	0		2 SW	1 P Rs haze
14	9	29.960	48.4	48.0	41.8	47.3	61.5	48.2	0		1 E	10 P haze
15	9	29.940	45.2	42.0	37.0	41.5	50.2	42.0	0		1 S	10 P haze
16	9	30.015	53.3	54.6	41.3	53.9	72.2	54.3	0		1 N	10 Rm 7m —; a little rain
17	9	29.704	45.0	38.7	37.1	38.2	54.4	38.9	6½	0.574	2 NE	10 P fog
18	9½	30.102	42.0	41.0	32.9	40.5	40.6	40.6	0⅜	0.033	2 N	10 Rm 7m
19	9	30.254	42.9	48.1	35.7	47.6	48.5	47.7	0		2 S	7 Rm 7m —
20	9	29.951	49.2	56.6	42.8	55.5	56.0	54.6	0⅛	0.011	2 S	10 P
21	9	30.263	47.2	51.5	38.0	51.3	58.7	51.6	0⅝	0.053	1 E	2 P Rs
22	9½	30.049	52.0	58.3	39.0	57.2	64.0	56.3	0		1 SW	0 haze
23	9	30.002	47.0	44.2	40.0	43.7	69.0	44.3	0		2 NE	1 Rm Rs 7m
24	9	30.081	46.6	38.2	34.3	37.8	48.3	37.8	2½	0.221	1 E	10 P 7m
25	9	30.168	44.0	44.7	30.1	44.4	47.0	44.8	0		1 E	1 P haze
26	9	29.785	48.9	53.1	42.7	52.2	54.0	52.7	0		1 SW	10 Rm
27	9	29.749	53.8	54.4	48.8	53.8	59.8	54.3	0¾	0.066	3 W	3 M 7m
28	9	30.223	48.8	47.6	37.5	46.6	61.2	47.2	0		2 N	0
29	9½	30.287	51.0	54.2	43.1	58.0	58.2	58.0	0		2 SW	1 0 P haze
30	9½	29.560	56.0	59.9	53.8	59.2	66.2	59.4	5½	0.485	1 NW	10 Rm 7m
	9.1	867.848 29.926 −.046 29.880	1323.4 45.6	1352.8 46.6	1080.1 37.2	1332.6 46.0	1584.8 54.6	Mean. set inside building	22⅝	1.497 Rainfall for month 2.00 inches	56 1.9	164 5.7

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April, 1880.

Date	Time P.M.	Barom.	Att. Therm.	No. 4	Wind	Clouds.	Aurora.	Report to Signal Office.	Zod. light.
1	.	.	.	.	.	.	Blank.	B.	Blank
2							See p. 16	O	See p. 16
3							Obsc.	O	Obsc.
4							Obsc.	O	Obsc.
5	8 1/4	29.652	56.2	50.7	2 W	0 Rs	None ; see p. 16	N	Distinct
6							See p. 16	N	See p. 16
7	8	29.950	34.7	29.2	2 NW	0	None ; see p. 16	N	Visible
8	9 1/2	30.060	39.8	33.0	1 W	0 7m. haze	None now or at 8 P.M.	N	Distinct at 8 P.M.
9							Obsc.	O	Obsc.
10	8	29.562	50.0	47.2	2 SW	1 P haze	None ; see p. 16	N	Visible over clouds.
11							None ; see p. 16	N	Obsc.
12	8 1/4	29.866	37.0	33.1	2 W	0 Rs	Moonlight ; see p. 16	N	Moonlight
13	8 1/4	29.664	53.8	54.7	2 S	3 haze	Moonlight & haze	N	Moonlight & haze
14							Obsc.	O	Obsc.
15							Obsc.	N	Obsc.
16							Obsc.	O	Obsc.
17							Obsc.	O	Obsc.
18							Obsc.	O	Obsc.
19							Obsc.	O	Obsc.
20	9 1/4	30.094	50.0	45.4	0 SW	9 P Rs (thin)	Obsc.	N	Obsc.
21	8 1/2	30.178	54.5	49.0	1 S	9 P Rs (thin	Moonlight and clouds	O	Moonlight and clouds
22	8 1/4	29.880	56.2	51.1	2 S	1 P Rs haze	Moonlight ; see p. 17	N	Moonlight
23	8 1/2	30.066	52.9	42.7	1 SE	9 P 7m	Obsc.	O	Obsc.
24							Obsc.	N	Obsc.
25							Obsc.	O	Obsc.
26	8 3/4	29.610	54.0	55.2	1 S	3 P Rs haze	None ; some clouds	N	Suspected
27	8 1/4	29.988	57.2	51.3	1 W	8 Pm 7m	Obsc.	O	Obsc.
28	8 3/4	30.206	54.2	52.3	1 SW	10 Pm	Obsc. ; see p. 17	A	Obsc.
29	9	30.012	56.1	55.3	3 SW	10 P	Obsc.	O	Obsc.
30	8 1/2	29.757	56.0	40.3	2 NW	5 P 7m	None ; some clouds	N	Obsc.

In the report to the Signal Service on aurora, B stands for Blank, or no observation; O for obscured or too cloudy for seeing aurora; N for none; A for aurora seen at some time during the evening.

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1880phae.proj.1718W

April, 1880.

3, 9½ A.M. Yesterday evening rather cloudy, with some stars visible; no aurora or zodiacal light seen.

4, 9½ A.M. Yesterday cloudy with a little rain, especially in the evening.

5, 9 A.M. Yesterday mostly cloudy. A few drops of rain, especially in the evening.

5, 10¾ P.M. Day cloudy rather warm; evening clear; no aurora seen.

7, 9 A.M. Yesterday cloudy, with a little rain in the evening; somewhat clear about 10 P.M. and later; no aurora seen.

7, 10¼ P.M. Day rather cold, cloudy with N.W. wind a few snowflakes. Evening nearly clear; no aurora seen at any time.

8, 9½ P.M. Day somewhat clear, cool. Evening rather clear.

10, 9 A.M. Yesterday rather clear and warm; evening cloudy.

10, 10½ P.M. Day windy, rather clear, warm. Evening rather clear, with increasing haze; no aurora seen at any time.

12, 9 A.M. Yesterday mostly clear, cool, windy. Cloudy about sunset; later in the evening clear at times; no aurora seen.

12, 10¼ P.M. Day rather windy, clear, cold. Evening clear, less wind; no aurora seen at any time.

13, 10 P.M. Day warm, windy, hazy; evening more hazy; no aurora seen at any time.

15, 9 A.M. Yesterday cloudy, cool; evening cloudy.

16, 9 A.M. Yesterday cloudy, warm; evening cloudy, somewhat clear about 11 P.M.; no aurora.

17, 9 A.M. Yesterday cloudy, cool, with a little rain; more rain in the evening.

18, 9½ A.M. Yesterday cloudy, cool, with a little rain, & few snowflakes in the evening.

19, 9 A.M. Yesterday cloudy morning and evening, somewhat clear part of the afternoon.

20, 9 A.M. Yesterday cloudy, rather cool. Thunderstorm reported to have occurred during the night of April 16–17.

20, 9½ P.M. Day cloudy and warm with a little rain about 3 P.M.; thin clouds later; indefinite lunar halo most of the evening.

21, 9 A.M. Towards midnight yesterday somewhat clear. No aurora (moon)

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21, 8½ P.M. Day rather clear, warm; thin clouds towards night. Lunar halo.

22, 9¼ A.M. Thin clouds all yesterday evening.

22, 8¼ P.M. Day warm, rather clear; somewhat hazy.

22, 10½ P.M. Evening warm, somewhat cloudy; moonlight; no aurora seen.

23, 8½ P.M. Day rather clear, cool, more cloudy towards night.

24, 9 A.M. Snow and rain early this morning.

25, 9 A.M. Yesterday cloudy; partly clear at times late in the evening; moonlight; no aurora seen.

26, 9 A.M. Yesterday rather clear, warm; evening cloudy.

26, 8¾ P.M. Day cloudy, warm; a little rain before noon. Somewhat clear at 8½ P.M.

27, 9 A.M. Yesterday evening cloudy after 9½ P.M. Raining about 2½ A.M. this morning, and mostly cloudy at 4 A.M.

27, 8¼ P.M. Day rather clear at first, then cloudy; a few drops of rain about 4 P.M.

28, 9 A.M. Broken clouds all yesterday evening; almost wholly cloudy at 10 P.M.

28, 8¾ P.M. Day clear at first, then cloudy; clear again for a short time after 8 P.M.; no aurora or zodiacal light then seen.

29, 9½ A.M. Clear again yesterday at 11 P.M.; some auroral light strongly suspected at 11½ P.M.

29, 9 P.M. Day cloudy; windy; evening rainy. A few drops of rain about 6 P.M. and later.

30, 9½ A.M. Previous night windy with rain.

30, 8½ P.M. Day warm at first becoming cold with brisk northwest wind. Rather cloudy.

30, 10¾ P.M. Clear, no aurora.

Report to Signal Service, May 1: Aurora looked for every clear evening; some auroral light strongly suspected April 28, 11½ P.M. No observations April 1. The evenings of April 5, 7, 8, 12, 30, were generally clear; the rest either wholly or mostly cloudy; moon also hindering observations April 12–22. Zodiacal light looked for every clear evening; distinct April 5, 8; visible April 7; visible over clouds April 10; suspected (sky somewhat clear) April 26; no observation April 1; observations on other evenings hindered by moonlight or clouds. [In the "Monthly Weather Review" for March, p. 15, for Zeta (without name of constellation) read Xi² Ceti]. Thunderstorm reported to have occurred during the night of April 16–17. Lunar halos on the evenings of April 20 and 21.

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May, 1880.

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	30.007	43.0	38.7	33.7	38.0	66.2	39.0	0		2 NW	5 M 7m ~ Rs	1
2	9	30.021	49.0	48.5	37.8	47.9	48.7	48.7	0		1 SW	10 Pm; a few drops of rain	2
3	9	30.058	50.9	55.8	44.2	55.0	55.0	55.0	5¼	0.463	1 SW	9 P Rs	3
4	9	30.104	60.3	69.8	54.9	68.9	77.8	68.6	0		1 W	8 P 7m —	4
5	9	30.089	61.8	67.3	55.5	66.4	82.8	66.1	0¼	0.022	2 SW	2 P Rs 7m —	5
6	9	29.658	60.0	59.9	51.8	59.2	74.5	59.7	0		1 S	10 Pm; raining	6
7	9	30.166	53.0	48.8	43.2	48.0	76.0	49.0	0⅛	0.011	1 E	1 P 7m ←	7
8	9	30.110	55.0	56.3	47.3	55.4	57.3	56.0	0		1 W	2 P Rs haze	8
9	9	30.000	58.4	67.2	51.2	66.1	66.2	65.9	0		2 SW	6 P 7m haze	9
10	9¼	30.053	60.5	59.0	48.0	58.3	86.2	58.8	0		1 E	2 P haze	10
11	9¼	29.940	67.3	70.8	58.2	70.0	87.1	70.0	0		1 SW	10 Pm 7m; a little rain	11
12	9	29.882	63.2	62.9	54.5	62.2	80.8	62.3	0		2 NW	4 M 7m ~	12
13	9¼	29.829	54.8	50.7	43.2	50.1	68.6	51.2	0		3 N	10 Pm 7m	13
14	9	30.188	51.7	46.3	40.2	45.9	52.5	46.6	2½	0.221	2 N	5 M 7m	14
15	9	30.242	50.4	51.6	38.6	51.0	51.4	51.4	0		2 N	0 7m	15
16	9	30.060	54.7	61.3	45.8	60.9	60.7	60.3	0		1 W	10 Pm 7m	16
17	9	29.815	57.7	62.7	47.7	62.1	65.0	62.0	0		0 W	4 haze	17
18	9¼	30.037	58.0	55.1	49.2	54.6	82.4	55.1	0⅛	0.011	1 NE	10 Pm 7m; a little rain	18
19	9¼	30.164	55.0	51.4	46.7	50.5	55.3	51.6	3¼	0.287	1 SE	10 Pm 4m; a little rain	19
20	9	30.022	61.1	66.9	50.4	66.0	66.7	66.0	0		1 SW	5 P haze	20
21	9¼	30.093	66.1	71.7	58.8	70.3	84.0	70.1	0		1 S	1 Rs	21
22	9¼	30.238	68.1	72.4	59.9	71.2	83.2	71.3	0		3 S	5 M 7m haze	22
23	9	30.190	65.9	66.4	60.4	65.7	76.3	66.0	0		2 SW	10 P	23
24	9	30.104	67.3	71.3	59.3	70.4	75.6	70.4	0		1 W	3 Rs 7m	24
25	9	30.092	71.7	71.2	64.9	70.4	85.0	70.6	0		1 E	4 Pm 7m ~ haze	25
26	9	30.004	75.8	82.5	68.5	81.7	81.6	81.3	0		2 NW	1 Rs haze	26
27	9	29.907	79.7	82.8	70.3	82.0	91.9	82.0	0		1 W	0 haze	27
28	9	29.816	78.1	79.3	70.1	78.3	91.3	78.8	0		1 W	2 Pm 7m haze	28
29	9¼	30.188	68.5	63.8	56.0	63.1	84.7	63.7	2	0.177	2 NE	0	29
30	9	30.204	66.7	61.6	54.0	61.1	73.9	61.4	0		2 E	10 Pm; a little rain	30
31	9	29.824	66.9	67.5	54.1	67.0	67.2	67.0	3⅝	0.319	2 SW	10 Pm 7m /	31
	9.1	931.106 / 30.036 / −.058	1900.6 / 61.3	1941.5 / 62.6	1618.4 / 52.2	1917.7 / 61.9	2257.9 / 72.8	May 2d / single / [illegible]	17⅛	1.511 / Rainfall for month	45 / 1.5	169 / 5.5	

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May, 1880.

Date	Time P.M.	Barometer	Attached Thermometer	No. 4	Wind	Clouds.	Aurora.	Report to Signal Office	Zodiacal light.
1							See p. 20	O.	Obsc.
2	10 3/4	30.089	51.2	46.0	0	4 Pm 7m	None seen or at 8 P.M.	N.	None now or at 8 P.M.
3	8 3/4	30.028	62.7	64.4	2 S	9 P	None; rather cloudy	N.	Cloudy
4	8	30.158	67.8	66.1	1 SE	9 P 7m	Cloudy	O.	Cloudy
5	8 2/3	29.900	66.7	61.0	1 SE	9 P haze	Cloudy	O.	Cloudy
6	8 1/2	29.806	64.2	53.3	3 NW.	1 Pm 7m	None; some clouds	N.	None; some clouds
7							Cloudy	O.	Cloudy.
8	8 1/2	30.064	60.6	53.5	1 S	2 P 7m haze	None; some clouds	N.	None
9	8 1/2	29.959	69.0	72.2	1 S	7 P haze	Cloudy	O.	Cloudy
10	8 1/2	29.990	71.6	69.9	2 S	2 P haze	None; some clouds	N.	None; some clouds
11	8 1/4	29.936	73.8	69.4	1 W	0 P	None; moon & twilight	N.	Moon & twilight
12								O.	
13								O.	
14								O.	
15								N.	
16								N.	
17	8 1/2	29.910	69.8	63.9	0 calm	2 P R haze	None; moon & twilight	N.	Moon & twilight
18								N.	
19								O.	
20								O.	
21								N.	
22								N.	
23								N.	
24	9 3/4	30.061	78.8	76.2	0 calm	9 Pm 7m →	Mostly cloudy	N.	Cloudy
25	8 1/2	29.957	77.0	75.1	2 S	9 P R haze	Twilight	N.	Twilight
26								O.	
27	11 1/4	29.807	82.5	76.2	1 SW	1 haze 7m	None	N.	None
28								O.	
29								O.	
30								O.	
31	8 1/4	29.909	73.1	67.8	0 calm	1 Pm 7m	Twilight	N.	Twilight & clouds

See note p. 15

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May, 1880.

2, 9 A.M. Yesterday rather clear, cool; evening cloudy. Somewhat clear at 11½ P.M.; auroral light suspected among clouds.

2, 10¾ P.M. Day cloudy with showers till 2 P.M., clear 7½ to 10½ P.M.

3, 8¾ P.M. Day rather cloudy, warm, windy.

4, 9 A.M. Yesterday evening hazy and rather cloudy; no aurora seen.

4, 8 P.M. Day rather hot, with thunder showers in the afternoon to the northward, and a little rain. Lightning without thunder later.

5, 9 A.M. More thunder yesterday after dark. Partly clear at 11½ P.M.; some clouds in the north; no aurora seen.

5, 8⅔ P.M. Day warm, rather clear; now cloudy towards night.

6, 9 A.M. Yesterday evening cloudy; somewhat clear after 11 P.M., but still cloudy in the north. This morning partly clear, clouding up with a shower at 9 A.M.

7, 9 A.M. Yesterday rather clear, warm; partly cloudy in the evening; no aurora seen at any time.

8, 9 A.M. Yesterday cloudy, chilly; evening cloudy.

8, 10⅓ P.M. Day rather clear and cool; evening hazy, partly clear; now cloudy; no aurora at any time.

10, 9½ A.M. Yesterday hot, hazy; thick haze in the evening; no aurora seen.

11, 9½ A.M. Yesterday rather clear; haze increasing in the evening; no aurora seen.

12, 9 A.M. Yesterday warm, mostly clear; no aurora seen at any time; a few drops of rain only yesterday forenoon.

13, 9½ A.M. Yesterday rather clear and warm with passing clouds; evening cloudy. Somewhat clear early today; cloudy now.

14, 9 A.M. Yesterday cloudy and chilly, with occasional showers.

15, 9 A.M. Yesterday cloudy and chilly, with a few drops of rain.

16, 9 A.M. Yesterday cool, rather clear; evening mostly cloudy; rather clear after 10 P.M.; moonlight; no aurora seen.

17, 9 A.M. Yesterday mostly cloudy, with a few drops of rain; becoming clearer in the evening; nearly clear after 10 P.M., moonlight; no aurora seen.

17, 10¾ P.M. Day warm, hazy; evening hazy at first, clearer after 10 P.M.; no aurora seen.

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19, 9½ A.M. Yesterday cloudy with rain; mostly clear after 10 P.M.; no aurora seen.

20, 9 A.M. Yesterday hazy, rather warm; evening cloudy.

21, 9¼ A.M. Yesterday hazy, rather hot; evening cloudy (thick haze).

22, 9¼ A.M. Yesterday warm, somewhat clear; clouds and haze in the evening, especially in the north; no aurora seen.

23, 9 A.M. Yesterday warm, variable, with a few drops of rain; evening rather cloudy, clouds increasing; no aurora seen.

24, 9 A.M. Yesterday warm, rather cloudy; evening clear till 9 P.M., then cloudy; no aurora seen.

25, 9 A.M. Yesterday warm, rather cloudy; evening clear at first, cloudy 8½ to 9½ P.M. with a few drops of rain; clear about 11 P.M.; moonlight; no aurora.

26, 9 A.M. Yesterday rather hot, mostly clear; evening clear, no aurora.

27, 9 A.M. Yesterday hot, rather clear; some clouds after noon; evening cloudy, with much lightning and some thunder, but no rain.

27, 11¼ P.M. Day hot, mostly clear; evening somewhat hazy; no aurora seen.

29, 9¼ A.M. Yesterday rather hot, somewhat cloudy; shower with a little thunder after 2 P.M.; evening mostly cloudy; sky somewhat light among clouds in the north at 10 P.M.; light probably not auroral.

30, 9 A.M. Yesterday warm, rather clear; evening cloudy.

31, 9 A.M. Yesterday cloudy, with a little rain; more in the evening.

June 1, 9 A.M. Yesterday cloudy at first, clearing off; evening somewhat cloudy 8½ to 9½ P.M.; clear later; no aurora seen at 11 P.M. or earlier.

Report to Signal Service June 1; aurora looked for every clear evening; none seen. Some light among clouds in the north at 10 P.M. May 28; this light thought not to be auroral. Few evenings entirely clear or entirely cloudy. So that the record on the opposite side of the sheet is unusually indefinite this month. Zodiacal light looked for every clear evening; none seen. The evenings of May 2, 6, 8 and 10, were the only ones when the presence of zodiacal light could have been noticed, even supposing it to have been somewhat brighter than the Milky Way; and none was seen, as already stated. Thunder showers noticed to the northward in the afternoon of May 4. Lightning and a little thunder in the evening. Much lightning and some thunder, without rain, evening of May 26. Shower May 28, after 2 P.M., with a little thunder.

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June 1880.

Date	Time L.M.	Barometer	Attached thermometer	No. 11	Minimum before and after setting	Maximum before and after setting		Gauge	Rainfall in inches	Wind	Clouds	Date
1	9	29.950	69.8	74.8	59.4	74.0	77.7	74.0	0		1 W	5 P Rs	1
2	9¼	30.089	63.0	51.9	48.6	51.3	83.3	53.0	4¼	0.375	1 N	10 Pm	2
3	9	30.160	61.2	62.3	48.0	61.5	61.6	61.5	0		3 NE	1 P 7m	3
4	9	30.238	61.2	61.4	51.3	60.7	65.0	61.0	0		2 E	2 M 7m haze	4
5	9	30.306	60.0	61.8	48.1	61.1	63.8	61.2	0.		1 SW	2 M 7m P Rs	5
6	9¼	30.080	62.7	61.1	56.2	60.3	70.7	60.9	0⅛	0.011	1 S	10 Pm 7m 1; a little rain	6
7	9¼	29.902	64.2	66.0	59.1	65.1	68.0	65.3	0¼	0.022	2 E	10 Pm	7
8	9¼	30.152	61.2	53.7	51.5	53.1	68.0	54.0	0¼	0.022	3 NE	10 Pm	8
9	9	30.220	58.1	53.3	50.0	54.8	55.0	55.0	0¼	0.022	2 NE	10 Pm	9
10	9	30.190	58.9	63.3	47.0	62.7	62.7	62.3	0		1 N	0 7m	10
11	9	30.070	65.1	69.4	56.2	68.5	74.0	68.6	0		1 W	2 haze 7m	11
12	9	29.740	70.0	78.0	65.0	77.0	83.2	77.0	0		2 NW	4 M 7m Rs	12
13	9	29.662	70.0	70.2	63.3	69.3	84.9	69.7	1	0.088	2 N	0 Rs 7m	13
14	9¼	29.645	68.0	65.7	59.6	65.1	81.1	65.4	0¼	0.022	2 N	5 M 7m	14
15	9	29.891	66.6	68.11	56.0	67.4	77.1	67.3	0		1 E	5 M 7m Rs	15
16	9	29.984	66.0	67.0	52.2	66.8	72.0	66.8	0		1 W	0 7m	16
17	9¼	30.108	64.7	66.0	52.7	65.1	80.0	65.3	1¼	0.110	2 NE	3 P Rs haze	17
18	9	30.246	66.8	67.6	55.6	67.0	75.3	67.0	0		0 calm	1 haze	18
19	9	30.238	66.8	69.4	55.6	68.6	80.0	68.9	0		1 SW	1 haze	19
20	9¼	30.084	70.0	73.0	58.9	72.5		72.0	0		2 SW	0	20
21	9	29.832	71.3	73.4	60.6	72.8	86.0	72.8	0⅛	0.011	2 W	7 Pm 7m	21
22	9	29.768	66.6	65.7	53.8	65.1	81.3	65.3	0		3 NW	8 Pm M 7m	22
23	9	29.899	64.8	67.3	54.1	66.5	69.2	66.7	0		2 N	1 R 7m haze	23
24	9	29.888	69.6	74.8	62.3	74.0	76.2	73.9	0		1 SW	6 P 7m haze	24
25	9½	29.911	75.5	83.5	64.2	82.9	89.9	82.3	0		0 calm	5 P Rs 7m	25
26	9½	29.852	78.0	82.1	71.1	81.2	89.8	81.4	0		1 W	5 P R 7m	26
27	9	29.998	77.0	80.2	67.0	79.2	84.8	79.5	0		2 N	0 Rs 7m	27
28	9¼	29.818	77.4	81.6	65.0	80.8	90.0	80.8	0		2 S	3 P Rs 7m haze	28
29	9¼	29.817	80.7	81.0	71.9	80.2	93.9	80.4	1⅜	0.121	2 W	0 P Rs 7m	29
30	9	29.880	77.9	80.1	66.1	79.3	90.2	79.8	0		1 SW	5 M 7m Rs	30
	9.1	899.650	2033.1	2075.7	1730.4	2053.9	2239.7	Max. set inside building	9⅛	0.804	47	121	
		29.988	67.8	69.2	57.7	68.5	77.2			Rainfall for months 0.80 inches	1.6	4.0	
		.105											
		29.883											

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June 1880.

Date	Time P.M.	Barometer	Attached Thermometer	No. 4	Wind	Clouds	Aurora	Report to Signal Service	Zodiacal Light.
1								C.	
2								C.	
3								N.	
4								N	
5								C	
6								N	
7								C	
8								C	
9	8½	30.207	62.5	55.5	0 calm	1 Pm 7m	Twilight	N	Twilight & clouds
10	11	30.122	66.6	59.9	0 SW	0 7m haze	None	N	None
11								C	
12								N	
13	10¼	29.450	75.0	70.7	2 W	9 Pm 7m	Cloudy	N	Cloudy
14								C	
15								C	
16								N	
17								N	
18	8¾	30.256	72.7	65.3	1 S	1 PRs haze	None	N	None
19	8¾	30.195	75.7	67.2	2 S	3 Pm 7m	None	N	None
20								N	
21	11	29.783	73.0	62.9	1 N	0	Moonlight	N	Moonlight
22	8¾	29.836	68.8	63.1	2 NW	0 P 7m	None	N	None
23								N	
24								C	
25								N	
26								N	
27								N	
28	10½	29.749	83.9	78.0	2 S	4 P 7m	None; clouds	N	None; clouds
29	4½	29.910	85.3	79.4	0 calm	0 Rs	None; twilight	N	None; twilight
30	10¼	30.032	81.5	72.7	1 W	2 Pm 7m Rs	None; some clouds	N	None; some clouds

See notes p. 15.

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June 1880.

2, 9½ A.M. Yesterday warm, rather cloudy, growing cooler and cloudier. Some lightning and a little thunder in the evening, followed by rain.

3, 9 A.M. Yesterday cloudy and cool.

4, 9 A.M. Yesterday clear, rather cool; evening cloudy; nearly clear at 11 P.M.; no aurora.

5, 9 A.M. Yesterday rather clear and cool; evening mostly cloudy; nearly clear about 10 P.M., with clouds near horizon; no aurora seen; mostly cloudy at 11 P.M.

6, 9¼ A.M. Yesterday rather cloudy and cool; clouds increasing in the evening.

7, 9½ A.M. Yesterday cloudy with a little rain; clouds diminishing in the evening; hazy with clouds near horizon at 11 P.M.; no aurora seen.

8, 9½ A.M. Yesterday cloudy and cool, with a little rain.

9, 9 A.M. Yesterday cloudy and cool, with a little rain.

10, 9 A.M. Yesterday cloudy at first, becoming clear; no aurora seen at 11 P.M., or previously.

10, 11½ P.M. Day mostly clear and warm. No aurora seen.

12, 9 A.M. Yesterday mostly clear and warm. Evening cloudy.

13, 9 A.M. Yesterday rather cloudy and hot. Shower in the afternoon. Broken clouds in the evening; no aurora seen at 10½ P.M. or previously.

13, 10¼ P.M. Day variable with a short shower about 7 P.M. Evening partly clear; no aurora seen.

14, 9½ A.M. Cloudy between 2 and 3 A.M.

15, 9 A.M. Yesterday rather cloudy, and somewhat cool towards night; evening cloudy.

16, 9 A.M. Yesterday cloudy, rather cool; evening cloudy.

17, 9¼ A.M. Yesterday variable, with a slight thunder shower about 7 P.M.; evening mostly cloudy; no aurora seen.

18, 9 A.M. Yesterday rather clear and warm; evening rather clear; no aurora seen at 11 P.M. or previously.

19, 9 A.M. Yesterday warm, mostly clear; broken clouds after 9 P.M.; no aurora seen at 11 P.M. or previously.

20, 9½ A.M. Yesterday mostly clear, rather hot; broken clouds most of this evening; no aurora seen 10 P.M. or previously.

21, 9 A.M. Yesterday [illegible] and thunder

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shower about 7 P.M.; evening rather cloudy, nearly clear after 10 P.M.; no aurora seen.

21, 11 P.M. Day rather cloudy, with occasional thunder, becoming clear in the evening; no aurora seen.

22, 10½ P.M. Day clear, cool; some clouds after 10 P.M.; no aurora seen.

24, 9 A.M. Yesterday rather clear, warm; afternoon rather cloudy; evening mostly cloudy; no aurora seen. Cloudy with some clear spaces 1 to 2½ A.M. today.

25, 9½ A.M. Yesterday hot, rather cloudy; clouds and thick haze in the evening; no aurora seen; pretty clear 2 to 3½ A.M. this morning.

26, 9½ A.M. Yesterday hot; rather cloudy; evening somewhat clear overhead, but with clouds and thick haze; no aurora seen 11½ P.M. or previously.

27, 9 A.M. Yesterday hot, somewhat cloudy; evening rather cloudy, clouds mostly thin; nearly clear after 9½ P.M.; no aurora seen.

28, 9½ A.M. Yesterday hot, rather clear; thin clouds and thick haze in the evening; no aurora seen at 11½ P.M. or previously.

29, 10½ P.M. Day rather hot with occasional clouds; slight thunder shower about 7 P.M.; evening rather clear; no aurora seen.

29, 10½ P.M. Day clear, rather hot; evening clear; no aurora seen.

30, 10½ P.M. Day rather hot, somewhat cloudy; evening rather clear; no aurora seen.

Report to Signal Service, July 1; aurora looked for every evening; none seen. The only generally clear evenings were those of June 9, 10, 17, 18, 21, 22, 28, 29, 30, but others were clear at times. Moonlight during evenings of the middle of the month. Zodiacal light not seen. Thunder showers as follows: June 1; some lightning and a little thunder in the evening, followed by rain; 16, slight thundershower about 7 P.M.; 20, slight squall and thunder shower about 7 P.M.; 21, day rather cloudy, with occasional thunder; 28, slight thunder shower about 7 P.M.

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July 1880.

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	30.097	74.9	74.9	62.0	74.0	86.6	74.3	0		1 W	1 Rs 7m	1
2	9	29.874	74.9	64.7	64.2	64.2	87.1	65.0	Sept. 28	0.375	1 E	10 Pm 7m ↘ ; raining	2
3	9½	29.818	69.1	62.8	60.0	61.8	65.2	62.0	5 3/8	0.474	1 NE.	10 Pm 7m	3
4	9	29.988	68.6	69.5	60.8	68.7	68.7	68.7	1	0.088	1 N	1 7m ↙	4
5	9	30.020	72.5	76.0	62.0	75.1	80.0	75.1	0		2 SW	5 P Rs 7m →	5
6	9	29.898	73.3	72.9	66.0	72.2	85.3	72.4	0 3/4	0.066	1 SW	10 Pm	6
7	9	30.040	76.2	76.0	69.3	75.0	82.6	75.2	0		1 N	4 haze 7m ↙	7
8	10½	30.187	75.4	79.8	62.0	78.3	84.0	78.3	0		1 NE	0	8
9	9	30.049	75.5	69.0	68.3	69.0	87.5	69.4	Sept. 28	0.154	2 SW	10 Pm ; raining	9
10	9½	29.849	79.1	84.6	68.1	84.0	87.0	83.5	0		1 NW	2 Pm 7m haze	10
11	9	29.987	78.0	76.1	70.8	75.0	93.3	75.5	0		1 E	5 Pm Rm 7m →	11
12	9	30.192	73.2	69.5	59.5	68.8	83.3	69.5	0		2 E	10 Pm 7m ↘	12
13	9¼	29.745	73.0	73.5	64.6	72.2	76.8	73.0	19½	1.721	1 S	10 Pm	13
14	10	30.013	69.9	70.0	59.0	69.0	76.9	69.2	0		1 E	0 haze	14
15									Sept. 28	0.221			15
16	9	29.776	71.5	70.6	61.8	70.0	75.0	70.2	0		0 calm	10 Pm fog	16
17	9¾	29.740	73.7	74.4	67.2	73.3	81.3	73.3	4 1/4	0.375	2 W	0 7m	17
18	10	30.023	72.8	74.7	60.8	73.9	81.0	74.0	0		2 N	0	18
19	9¼	30.129	73.0	74.9	61.1	74.0	82.0	74.0	0		1 W	0	19
20	9	30.060	71.3	69.5	61.0	69.0	81.6	69.4	0		1 E	10 P haze	20
21	9¾	30.044	74.0	77.4	66.1	76.3	74.0 wet	73.9	Sept. 29 1 1/4	2.471	1 W	9 Pm M 7m →	21
22	10	30.150	74.0	73.5	66.7	72.3	78.8	72.8	0 1/8	0.011	0 calm	10 Pm	22
23	9	30.100	69.4	65.9	60.1	65.3	74.0	65.3	7 3/8	0.651	1 N	10 Pm	23
24	9¼	30.108	71.0	72.0	64.1	71.0	73.7	71.2	0 1/8	0.011	1 SW	9 Pm 7m ↗	24
25	9	30.094	72.8	73.8	64.1	73.0	80.8	73.0	0		1 SW	5 Pm 7m →	25
26	9	30.012	74.5	73.7	68.7	72.6	83.3	73.0	0		1 S	2 P Rs haze	26
27	9	29.995	74.8	74.4	66.3	73.4	83.0	73.6	0		1 W	4 P Rs M	27
28	9¼	30.010	69.0	66.7	60.0	66.0	83.5	66.3	1 1/4	0.110	3 NW	0 7m	28
29	9¼	29.936	65.9	62.8	54.3	62.0	72.5	62.4	0		2 N	0 Rs 7m	29
30	[illegible]								Sept. 29	0.022			30
31	11¼	30.107	70.8	76.7	57.8	75.8	75.7	75.6	0		1 W	5 P Rs haze	31
	9.4	30.041 30.001 29.888	2112.1 72.8	2100.3 72.4	1830.7 63.1	2075.2 71.6	2324.5 80.2	Max. set inside	76½ in all.	6.750 Rainfall for month	35 1.2	152 5.2	

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July 1880.

Date	Time P.M.	Barometer	Attached Thermometer	No. 4	Wind	Clouds	Aurora	Rockport & Signal Service	Zodiacal Light.
1								Obsc.	
2								Obsc.	
3								Obsc.	
4	10½	30.031	75.5	68.6	1 SE	1 P haze	None	None	None
5								Obsc.	
6								Obsc.	
7	9	30.092	81.0	75.0	1 W	0 Rs	None	None	None
8								None	
9								None	
10								Obsc.	
11	10½	30.094	79.0	66.3	1 E	5 P Rs	None	None	None
12								Obsc.	
13	11½	29.827	71.4	64.3	0 calm	0 haze	Low arch, dark sky	Aurora	None
14	11¼	30.005	72.0	63.3	1 S	0 haze	None	None	None
15	8	29.834	72.3	68.5	1 S	10 Pm	Cloudy	Obsc.	Cloudy
16	9¼	29.664	76.6	73.9	1 S	1 Pm M 7m haze	Cloudy, with lightning	Obsc.	Moonlight
17								None	
18	10½	30.080	74.9	68.9	1 S	0 Rs	Moonlight	None	Moonlight
19								None	
20								Obsc.	
21								Obsc.	
22								Obsc.	
23								Obsc.	
24	10¼	30.094	76.5	69.1	@ 1 S	0 Rs	Moonlight	None	Moonlight
25								Obsc.	
26								Obsc.	
27								Obsc.	
28	11¾	29.977	69.7	60.5	1 NW	1 Pm 7m	Moonlight	None	Moonlight
29	11	29.922	67.6	56.6	1 NW	2 Pm 7m haze	Cloudy	Aurora	Cloudy
30	10¾	30.056	71.2	63.6	1 S	2 Pm Rs haze	None; some clouds	None	None
31		30.048	78.6	74.4	1 SW	1 Rs haze	None; some clouds	None	None

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July, 1880.

2, 9 A.M. Yesterday rather clear and hot; clouds increasing towards night, evening cloudy; began raining soon after midnight.

2, 1 P.M. Rain now little or none; gauge 4 1/4 ounces, or 0.375 inches.

3, 9 1/2 A.M. Yesterday cloudy, with a little rain. Some rain early this morning.

4, 9 A.M. Yesterday cloudy, warm, with a little rain. Raining a little about 10 P.M.

4, 10 1/2 P.M. Day rather clear and hot; no aurora seen.

6, 9 A.M. Yesterday warm and rather clear; evening cloudy, with a few drops of rain about 8 P.M., and more after 10 P.M.

7, 9 A.M. Yesterday rather cloudy and hot; evening cloudy, with a few drops of rain and a little thunder and lightning.

8, 10 1/2 A.M. Yesterday clear, hot; evening clear; no aurora seen at 3 A.M. today or previously.

9, 9 A.M. Yesterday clear hot; evening cloudy after 8 3/4 P.M.; no aurora seen.

9, 2 P.M. Rain till about 10 1/2 A.M.; gauge 1 3/4 oz.

10, 2 3/4 A.M. Yesterday hot, rather clear after the rain; evening hazy and somewhat cloudy; barometer now 29.837; att. th. 78.8; N.O. 4, 72.5; calm; clouds 1 Pm haze; no aurora seen up to this time; zodiacal light slightly suspected in the east.

11, 9 A.M. Yesterday hot, somewhat cloudy; evening cloudy.

11, 10 1/2 P.M. Day rather clear and warm; clouds increasing after 9 P.M.; no aurora seen.

13, 9 1/4 A.M. Yesterday cloudy; following night rainy, warm.

14, 10 A.M. Yesterday cloudy, warm; clearing off in the afternoon; evening mostly clear; aurora 10 P.M. to 2 A.M. July 14; some appearance of streamers at times.

14, 11 1/4 P.M. Day clear, warm; no aurora seen.

15, 8 P.M. Day cloudy with some rain; gauge at 8 P.M. 2 1/2 ounces.

16, 9 P.M. Yesterday evening cloudy.

17, 9 3/4 A.M. Yesterday cloudy, forenoon rainy; evening rather clear, with clouds and lightning in the north; cloudy soon after 11 P.M., with a few drops of rain; rather clear at midnight.

18, 3 A.M. Baro. 29.9.9. att. therm. 74.0. Nov. 64.2; wind N.W.;

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Clouds 0. Yesterday partly cloudy, rather hot; clear late in the evening, passing clouds earlier; no aurora seen.

19, 2 A.M. Bar. 30.078; att. therm. 73.9; No. 4, 64.7. Yesterday rather hot, mostly clear; evening clear; no aurora seen.

19, 9¼ A.M. Zodiacal light suspected in the east at about 2 A.M.

20, 12½ A.M. Bar. 30.095; att. therm. 74.2; No. 4, 63.4. Yesterday clear and warm; thin clouds in the evening; no aurora seen.

20, 5 P.M. Heavy rain, with some thunder, about 2 P.M.; less rain after 2½ P.M. Gauge 26¾ ounces; 2.361 inches.

21, 9¾ A.M. Yesterday evening cloudy; gauge this morning 1¼ ounces, 0.110 inches; total rainfall 2.471 inches.

22, 10 A.M. Yesterday cloudy and warm, with a few drops of rain.

23, 9 A.M. Yesterday cloudy and warm, with some rain, especially in the evening.

24, 9¼ A.M. Yesterday cloudy throughout, with a little rain.

24, 10¼ P.M. Day cloudy, growing clear; no aurora seen.

26, 9 A.M. Yesterday variable, rather hot; evening cloudy.

27, 9 A.M. Yesterday warm, rather clear; evening cloudy; somewhat clear at 3 A.M. today.

28, 9¼ A.M. Yesterday warm, rather cloudy; rain in the evening; clear late in the night.

28, 11¾ P.M. Day mostly clear, rather cool. No aurora seen.

30, 3¾ A.M. Bar. 29.902; att. therm. 65.8; No. 4, 53.6. Yesterday rather cloudy, cool, with slight showers in the afternoon, and a little thunder; evening partly clear, with some lightning without thunder; aurora suspected about midnight and later.

30, 12½ P.M. Gauge 0¼ ounces, 0.022 inches.

30, 10¾ P.M. Day clear, warm; evening somewhat cloudy and hazy; no aurora seen.

31, 11 P.M. Day hot, rather hazy; some auroral light slightly suspected at this time.

Report to Signal Service, Aug. 3: aurora looked for every clear evening; seen 10 P.M. July 13 to 2 A.M. July 14; some appearance of streamers at times; Zodiacal light suspected about midnight and later, night of July 29–30; slight, suspected also at 11 P.M. July 31; Zodiacal light suspected in the east July 16, 2¾ A.M., and July 19, about 2 A.M.; thunder showers: evening of July 6, a few drops of rain and a little thunder and lightning; clouds and lightning evening of July 16, in the north; July 20, 2 P.M., heavy rain, some thunder; July 29, slight showers and a little thunder in the afternoon; evening partly clear, with some lightning without thunder.

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August 1880.

Date.	Hour. A.M.	Barometer.	Attached Thermometer.	No. 11	Minimum, before and after setting.		Maximum, before and after setting.		Gauge	Rainfall in inches.	Wind.	Colored.	Date.
1	11	30.115	76.4	81.8	64.3	81.0	82.4	81.0	0		1 W	0 hazy	1
2	9¼	29.980	75.3	77.0	66.0	76.1	87.1	76.4	0		2 SW	1 Pm haze	2
3	9	29.964	77.3	77.5	70.3	76.8	86.0	77.0	0		1 W	10 Pm M Fm	3
4	9	30.036	70.0	63.8	61.3	62.1	78.5	64.0	7 only 7 oz	0.618	ONE	10 Pm fog & rain	4
5	9	30.154	69.8	67.8	67.0 to 62.5		74.2	65.2	8 3/4	0.772	1 NW	10 P	5
6	9	30.194	67.6	66.0	56.9	65.2	74.2	65.5	0		1 N	3 Pm slight haze	6
7	9	30.194	68.2	68.6	58.0	67.8	79.2	68.7	0		0 N	0 haze near Lungan	7
8	9	30.180	69.9	72.2	61.2	71.0	80.3	71.6	0		1 NW	0	8
9	9	29.978	71.5	72.0	62.7	71.2	79.7	71.6	0		1 SW	1 Fm haze near	9
10	9	29.874	73.4	72.2	62.0	74.8	84.0	74.8	0		1 NW	6 Fm haze haze near	10
11	9	29.992	73.8	69.2	66.2	68.6	84.9	69.1	0		9 ONE	9 Fm Pm	11
12	9	30.060	70.8	67.9	62.0	67.2	76.3	67.8	0		0 ENE	10 Pm	12
13	9	30.020	67.0	68.1	56.2	67.4	77.4	68.2	0		1 NW	0 haze	13
14	9	29.756	70.8	72.0	61.3	71.0	81.2	71.8	0		1 SW	10 Pm Fm haze	14
15	9½	29.878	67.8	65.6	57.3	65.0	77.6	66.4				8 Pm Fm	15
16	9	30.314	59.2	58.0	45.4	57.2	68.4	57.9			1 NW	0	16
17	9	30.404	62.3	62.3	48.0	61.6	68.6	62.8	0		1 N	0 haze near haze	17
18	9	30.320	62.4	62.2	51.3	61.8	73.9	67.2	0		0 SW	9 Fm haze near haze	18
19	9	30.084	66.7	69.4	55.0	68.4	76.4	69.2	0		1 S	9 7 Fm	19
20	9	29.738	71.5	76.0	67.2	74.8	75.5	74.9	not measured 1/4 oz	See Aug. 22	2 SW	9 Pm	20
21	9	29.734	73.9	75.6	68.7	74.8	82.2	74.8			0 SW	10 P	21
22	9 3/4	29.964	73.2	72.9	62.0	71.9	84.1	72.8	3/4 oz	0.066	NW	0 Pm haze	22
23	9	30.134	71.3	72.9	60.0	72.1	83.0	72.8	0		1 W	0 haze near	23
24	8	30.160	74.0	72.0	66.8	71.0	87.4	72.2	0		0 NSW	0 7 Fm	24
25	9	30.002	78.6	76.2	70.4	75.2	86.8	75.6	0		N	10 Pm	25
26	10¼	30.312	65.2	61.0	47.6	60.4	76.0	61.4	1/2 oz	See Aug. 29	1 NE	3 Pm	26
27	8½	30.264	59.8	56.2	42.4	53.0	63.8	57.8	0		0 ENE	0 haze near haze	27
28		30.113	66.6	70.5	52.8	69.8	69.8	69.8	0		1 SW	3 P Fm	28
29	9	30.050	74.4	79.7	68.0	79.0	83.2	79.0	0 1/4	0.022	1 NW	0 Rain haze	29
30	9	30.242	69.4	59.7	56.6	59.0	86.7	59.7	22 5/8	1.997	1 NE	10 Pm	30
31	9	30.262	63.0	62.5	50.0	61.5	64.3	61.8	0 1/8	0.011	1 E	0 haze	31
	9.1	932.489 30.080 29.969	2160.8 69.7	2151.8 69.4	1845.6 59.5	2123.7 68.5	2433.1 78.5	Max. set inside bowl dim	39½	3.486 Rainfall for month 3.500	24 0.8	132 4.3	

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August 1880.

Date	Time P.M.	Barometer	Attached Thermometer	No. 4	Wind	Clouds	Zodiacal light.	Aurora.	Report of the Signal Service
1	8	30.058	80.7	75.3	2 S	0	None	None	None
2							"		Obsc.
3	8					10 Pm	light rain		Obsc.
4	8					10 Pm	raining		Obsc.
5	9.30					10 Pm clouds			Obsc.
6	8	30.160	74.8	67.0	E 0	8 Pm Haze	clouds	clouds	Obsc.
7	8¼	30.200	~~78.2~~ 77.8	71.8	S.E	0	Considerable	~~slight~~	Aurora
8	9					0	suspected unattended		Blank
9	9½						suspected	none	None
10	9	29.9??	78.4	69.7		1	none	suspected	Aurora
11	9					3 Pm ~~Clouds~~ haze	Clouds	Clouds	Obsc.
12	8½					0	moonlight	streamers ~ ene to w	Aurora
13	9½	29.904	76.3	67.7			"	" and arch	Aurora
14	9						clouds & haze	Clouds	Obsc.
15	9	30.102	63.5	56.3		0	moonlight	moonlight	None
16							"	"	None
17							" and haze	" and haze	None
18						4 haze	" and haze	" and haze	None
19	9					Clouds & haze	Cloudy & haze	clouds & haze	Obsc.
20	9					10 clouds	clouds	clouds	Obsc.
21									Blank
22	9					0	Moonlight	Moonlight, Au ~~sup~~ sp.	Aurora
23	9					3 Pm	"	"	None
24		30.03?	68.8	75.0	2 N W 3	0 Pm	~~no~~ None	Au sp.	Aurora
25							None	slight	Blank
26						0	none	slight	Aurora
27						0	not looked for	not looked	Blank
28									Blank
29									Blank
30	11½	30.218	66.3	54.7	1 N	1 Rg haze	None	None	None
31	11¾	30.224	67.6	55.7	1 E	0 fog	None	Low arch; sky dark below	Aurora

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August, 1880.

2, 10 P.M. Day clear, hot; evening clear: no aurora seen.
3, 9 A.M. Yesterday clear, rather hot; evening cloudy.
3. 8 P.m. Showers after about
4. 9. am. Showery since 7.30 am and misty at 9 am.
5. 9 am. A succession of showers yesterday, am shone a little while about 2 P.m. N.E wind during the day.
5. 9.30 P.m. Cleared up during the afternoon and early evening, but at 9.30 P.m is was cloudy again. A few stars were visible

11. 9 am. A slight sprinkle 1st 7–8 am.

12. 9 am. commenced to sprinkle about 10 minutes ago
12. 8½ P.m. A magnif. display. The streamers extended about 50° from the horizon. They were about 30' wide.

13. 9¼ P.m. Streamers and arch. Streamers not so fine as on the previous night, but at this time there was a magnetic or electric storm. The light would flash in waves and for there were perhaps half a dozen undulations in the height of the arch. I could see stars within 15° of the horizon

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August, 1880.

19 9 P.M. Moon visible through haze.

20. 9 a.m. A few slight sprinkles during the latter part of the night.

30, 9 A.M. Yesterday at first clear and hot; clouds increasing towards noon; thundershower 1¾ to 2¼ P.M.; afterwards much rain; evening and following night rather rainy.

30, 11½ P.M. Day cloudy with some rain, clearing off after sunset. No aurora seen.

31, 11¾ P.M. Day clear and cool with light east wind. Aurora most of the evening; some slight appearance of streamers about 9 P.M.

Report to Signal Service Sept. 1; aurora conspicuous during the evenings of Aug. 12, 13 and 31; slight or suspected Aug. 7, 19, 22, 24, 26. On Aug. 12, the streamers extended about 50° from the horizon, and were about 30° wide. On Aug. 13 there was an arch with streamers. The streamers were not so fine as on Aug. 12; but at 9½ P.M. the flashing was very noticeable, and there were perhaps half a dozen undulations in the height of the arch. Stars were seen within 15° of the horizon. On Aug. 31 there was a low arch over dark sky most of the evening; some slight appearance of streamers about 9 P.M.

Zodiacal light suspected on the evenings of Aug. 7, 8, 9.

Thunder shower, rather brisk, 1¾ to 2¼ P.M. Aug. 30, followed by much rain.

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September 1880.

Date	7 o'clock 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	9½	30.245	64.2	62.8	50.1	62.3	68.1	62.8	0		1 S	1 Pm Rs haze	1
2	9¼	30.223	67.3	68.9	59.8	68.1	70.3	68.3	0		1 S	10 Pm	2
3	8¾	30.060	69.0	69.4	61.2	68.3	76.9	68.8	0		1 SW.	6 Pm Fm Rs haze	3
4	9¾	29.880	73.8	78.2	66.1	77.0	83.0	77.0	0		1 SW	7 Pm Fm haze	4
5	9½	29.896	77.2	80.0	70.1	79.1	85.7	79.3	0		2 NW	0 P Fm Rs haze	5
6	9½	29.908	74.4	75.4	65.0	74.7	86.8	74.7	0		0	5 Pm Fm Rs haze	6
7	9	29.960	73.9	65.4	63.1	64.7	85.6	65.3	0½	0.044	1 NE	10 Pm Fm haze	7
8	9	30.110	66.0	59.9	56.2	59.2	70.7	60.0	0		2 NE	10 P haze	8
9	9¼	30.147	64.3	58.5	57.8	57.8	62.5	58.2	0		2 NE	10 Pm	9
10	9	29.915	60.3	53.9	52.3	53.0	61.0	54.3	9¼	0.816	3 NE	10 Pm Fm H, a little rain	10
11	9	30.250	58.0	59.8	48.9	59.0	59.0	59.0	2⅛	0.188	2 NW	1 haze	11
12	9½	30.208	61.6	63.9	52.0	63.3	71.0	63.4	0		1 N	1 haze	12
13	9	29.985	65.4	66.5	56.0	65.5	72.7	66.0	0		2 SW	7 Pm Fm —	13
14	9	29.850	64.0	57.0	54.6	56.1	74.2	56.8	6¼	0.552	2 N	10 Pm Fm —	14
15	9	29.701	60.7	57.7	53.0	56.9	57.7	57.3	1	0.088	0 calm	10 Pm	15
16	9	29.807	59.0	59.3	51.1	58.8	61.9	59.0	0		2 W	3 Pm Fm	16
17	9¼	29.947	61.6	63.7	53.2	62.8	68.3	63.0	0		1 W	1 Fm haze	17
18	9	30.037	65.0	64.5	57.1	63.8	73.9	64.0	0		0 calm	10 Pm N Fm —, a little rain	18
19	9	30.225	64.8	65.6	57.1	64.8	69.0	64.9	0		1 NE	7 Pm Fm — haze	19
20	9	30.112	65.8	65.1	61.0	64.1	69.0	64.8	0		1 SE	10 Pm haze	20
21	9	29.945	69.1	67.6	64.0	66.8	77.2	67.0	0		1 NW	9 Pm Fm —	21
22	9¼	30.082	59.7	57.9	50.3	57.0	72.0	57.5	0		3 NW	2 Rs Fm —	22
23	9	30.246	55.0	53.0	44.2	52.3	64.0	53.0	0		2 NW	0	23
24	9	30.350	50.4	49.8	39.5	49.7	61.3	50.2	0		1 SW	0 Rs	24
25	9	30.243	59.3	59.0	49.6	58.2	65.4	58.7	0		1 SW	0 Rs haze	25
26	9	30.180	60.9	61.9	52.2	61.0	71.2	61.2	0		1 S	1 Rs haze	26
27	9	29.990	66.6	70.0	58.6	69.0	74.1	69.0	0		2 SW	10 Pm Fm	27
28	9	29.750	69.2	71.0	65.2	70.0	77.3	70.2	0		1 SE	10 Pm	28
29	9	29.802	59.7	57.9	48.0	56.9	77.2	57.6	0¼	0.022	2 SW	0 P	29
30	9	30.010	55.8	52.2	42.2	51.4	68.4	52.0	0		1 W	0	30
		901.066	1922.0	1895.8	1659.8	1871.6	2135.4	Max. out inside building	19⅜	1.710	41	160	
		30.036	64.1	63.2	55.3	62.4	71.2			Rainfall for month 1.71 inches	1.4	5.3	
	9.1	−.095											
		29.941											

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September 1880.

Date	Time P.M.	Barometer	Attached Thermometer	No. 4	Wind	Clouds	Zodiacal light	Aurora	Report to Signal Service
1	About 9	30.248	70.1	62.2	1 S	9 Pm	Cloudy	None	None
2	10 3/4	30.112	71.5	65.0	1 S	1 Rs haze	None	None	None
3	About 8	29.954	78.4	73.6	1 SW	0 haze	None	None	None
4	7 3/4	29.823	80.8	76.4	2 S	0	None	None	None
5	7 1/4	29.912	84.9	78.4	1 NW	0 Pm 7m	None	None	None
6									Obsc.
7									Obsc.
8									Obsc.
9									Obsc.
10									Obsc.
11	7 3/4	30.222	68.5	63.3	0	0	Moonlight	Moonlight	None
12	10	30.092	70.0	59.5	1 SE	0 7m	Moonlight	Moonlight	None
13									Obsc.
14									Obsc.
15	9	29.818	62.9	56.2	1 E	1 Pm	Moonlight	Moonlight	None
16	8	29.881	66.8	60.9	1 SE	2 P 7m	Moonlight	Moonlight	None
17	7 2/3	29.974	71.3	67.0	2 S	0	Moonlight	Moonlight	None
18									None
19									Obsc.
20									Obsc.
21	7 3/4	29.932	71.8	62.1	1 S	7 Pm 7m →	None; some clouds	None; some clouds	None
22	8	30.143	64.9	55.5	1 S	8 Pm 7m →	Cloudy	Cloudy	None
23	7 3/4	30.299	59.4	53.0	1 SW	0 7m	None	None	None
24	7 1/2	30.269	64.7	58.0	1 S	0 haze	None	None	None
25	8	30.196	67.0	62.0	1 S	0 haze	None	None	None
26									None
27									Obsc.
28	9 1/2	29.701	70.9	58.5	1 SW	5 Pm 7m haze	None; some clouds	None; some clouds	Aurora
29	7 1/2	29.886	67.9	58.1	1 SW	0 P haze	None	None; some clouds	Aurora
30	6 3/4	30.119	64.2	54.1	0 calm	3 Pm 7m ↘	Cloudy	None; some clouds	Aurora

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September 1880.

2, 9¼ A.M. Yesterday mostly clear, rather warm; clouds increasing after 8½ P.M.; no aurora seen.

2, 10¾ P.M. Day warm, cloudy, clearer towards night; evening somewhat hazy; no aurora seen.

4, 9¾ A.M. Yesterday hot, clear; evening somewhat cloudy after 10 P.M.; no aurora seen; nearly clear at 5 A.M. today, with clouds increasing.

5, 9½ A.M. Yesterday hot, clear on the whole; evening clear; no aurora seen.

6, 9½ A.M. Yesterday hot, rather clear; evening clear; no aurora seen.

7, 9 A.M. Yesterday hot, rather clear; cloudy towards night; evening cloudy; rain early this morning.

8, 9 A.M. Yesterday cloudy, cooler; evening cloudy.

9, 9¼ A.M. Yesterday cloudy, rather cool; evening cloudy.

10, 9 A.M. Yesterday cloudy, cool; evening rainy.

11, 9 A.M. Yesterday cloudy, with some rain; evening cloudy, clearing off about midnight.

12, 9½ A.M. Yesterday clear, warm; evening clear; no aurora seen.

13, 9 A.M. Yesterday clear, warm; evening clear; no aurora seen.

14, 9 A.M. Yesterday cloudy; evening rainy.

15, 9 A.M. Yesterday cloudy, cool; evening cloudy.

16, 9 A.M. Yesterday cloudy, cool; evening partly clear; no aurora seen.

17, 9¼ A.M. Yesterday partly cloudy, rather warm; evening partly clear; no aurora seen.

17, 10¼ P.M. Day mostly clear, warm; evening partly cloudy; imperfect lunar halo 10 P.M.; no aurora seen.

19, 9 A.M. Yesterday rather cloudy, with a few drops of rain about 9 A.M.; evening mostly cloudy; nearly clear at 10½ P.M.; no aurora seen.

20, 9 A.M. Yesterday rather cloudy, warm; evening cloudy.

21, 9 A.M. Yesterday rather cloudy, warm, with a few drops of rain about sunset; evening cloudy.

22, 9¼ A.M. Yesterday mostly rather clear, with clouds at times; many passing clouds during the evening; no aurora seen.

23, 9 A.M. Yesterday mostly clear, cool; evening mostly cloudy; no aurora seen.

24, 9 A.M. Yesterday clear, rather cool; evening clear; no aurora seen.

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1880phae.proj.1718V

September 1880.

25, 9 A.M. Yesterday clear, rather cool; evening clear; no aurora seen.

26, 9 A.M. Yesterday clear, warm; evening clear; no aurora seen.

27, 9 A.M. Yesterday mostly clear, warm; evening hazy, with some clouds; no aurora seen.

28, 9 A.M. Yesterday cloudy and warm; a few drops of rain in the evening.

28, 11 7/4 P.M. Day cloudy and warm with a little rain about sunset; evening partly clear; low auroral arch 9 3/4 P.M. and later.

30, 2 1/2 A.M. Bar. 29.929; attached therm., 63.0; No. 4, 48.0. Yesterday clear, warm; evening mostly clear; ~~bow~~ auroral arch over clouds formed as early as 8 P.M.; breaking up at 1 1/2 A.M. today; gone now.

30, 11 1/4 P.M. Day mostly clear, rather cool; evening clear, cool; some auroral light at present.

Report to Signal Service, sent Oct. 1, 1880.

Aurora — looked for every clear or partly clear evening; Sept. 28, low arch 9 3/4 P.M. and later (clouds early in the evening); Sept. 29, low arch over clouds formed as early as 8 P.M.; breaking up at 1 1/2 A.M. Sept. 30, gone at 2 1/2 A.M.; Sept. 30, 11 1/4 P.M., some auroral light.

Zodiacal light — looked for every clear evening; none seen.

Lunar halo, imperfect, 10 P.M. Sept. 17.

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1880phae.proj.1718W

October 1880.

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
	9	30.340	51.0	48.5	38.9	47.4	62.0	48.3	0		1 NW	0 Rs	
2	9	30.330	54.1	49.6	40.4	49.3	57.2	50.2	0		0 calm	0 haze	2
3	9	30.255	53.9	51.8	42.9	51.2	60.7	51.7	0		1 S	6 Pm Fm →	3
4	9	30.064	60.0	62.9	52.4	61.8	66.7	62.1	0		2 S	10 Pm Fm →	4
5	9	30.025	62.2	54.2	52.0	53.8	72.3	54.8	1 1/4	0.110	1 SW	10 Pm Fm ↑; a little rain.	5
6	9	29.836	56.7	53.9	43.8	53.0	55.7	54.0	0 1/2	0.041	2 SW	5 Pm Fm ↑ haze	6
7	9	30.048	52.0	49.9	41.0	49.0	64.8	49.8	0		3 NW	1 Pm Fm ↘	7
8													8
9													9
10	9 1/4	30.274	51.7	50.3	36.2	49.4	65.0	50.3	0		1 NW	0 haze	10
11	9 1/4	30.272	56.9	55.2	47.1	54.3	62.7	55.3	0		1 S	5 haze Fm ↑	11
12	9 1/4	29.952	61.0	63.9	53.8	62.7	71.0	62.9	0		3 SW	1 haze Fm	12
13	9 1/4	30.194	49.5	45.4	39.1	44.6	54.6	45.5	1 1/2	0.132	3 N	0	13
14	9	30.218	47.1	46.4	34.3	45.5	54.7	46.3	0		1 NW	0	14
15	9 1/4	29.927	51.2	52.0	42.8	51.1	61.8	51.9	0		1 W	9 Pm Fm →	15
16	8 1/4	29.936	55.7	50.8	46.5	50.3	67.9	51.0	0		1 SW	5 Pm Fm →	16
17	9	29.812	62.7	67.3	50.2	66.2	69.9	66.5	0 1/8	0.011	2 SW	9 Pm M Fm ↑	17
18	9	30.062	53.1	46.0	39.3	45.0	74.2	45.8	1 3/4	0.154	1 W	0 Fm	18
19	9	30.274	45.0	41.2	33.8	40.4	52.6	41.0	0		2 W	0 Rs	19
20	9	30.322	50.1	42.8	37.2	42.0	51.0	43.0	0		0 calm	0	20
21	9	30.348	48.3	45.0	33.0	44.9	50.9	45.3	0		1 E	4 PRs haze	21
22	9	30.180	53.0	52.1	44.8	51.1	58.7	52.0	0		1 E	10 Pm Fm ↘	22
23	9	29.446	53.2	53.8	44.3	53.0	56.0	52.0	16 1/2	1.455	2 SW	5 Pm Fm	23
24	9 1/2	29.688	49.3	42.3	38.5	41.3	60.6	42.9	0 1/2	0.044	2 W	10 Pm M Fm →	24
25	9 1/4	30.028	37.7	33.5	29.0	32.9	45.3	34.0	0		2 NW	0	25
26	9 1/4	29.993	42.3	37.7	28.8	37.0	45.5	38.0	0		1 S	1 PRs Fm	26
27	9	29.903	50.1	50.2	37.1	49.5	51.8	50.2	0 1/8	0.011	0 calm	10 Pm	27
28	9	30.256	43.0	34.9	33.0	34.4	50.2	35.2	0		2 N	10 P	28
29	8 3/4	30.281	35.4	31.2	25.2	30.3	43.2	31.3			1 N	0 Rs haze	29
30	8 3/4	30.094	45.5	46.6	30.2	46.0	46.6	46.6	0		0	10 Pm	30
31	9	29.247	54.2	60.9	45.7	59.2	60.2	58.3	9 1/4	0.816	Misty	11 P Clouds	31
	9.0	871.606 30.055 -.061 29.994	1485.9 51.2	1423.3 49.1	1161.3 40.0	1399.6 48.3	1713.8 59.1	Mercury set inside cistern	31 1/2	2 inches Rainfall for month	38 1.4	131 4.5	

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Date	Time P.M.	Barometer	Attached Thermometer	No.4	Wind.	Clouds.	Zodiacal light.	Aurora	Report to Signal Service.
1	8	30.336	59.9	47.3	1 S.	0 haze	None	None	None
2	8	30.291	59.7	51.0	1 SE	1 P haze	None; some clouds	None; some clouds	None
3	8	30.158	64.3	56.1	1 S	0 P haze	None	None	None.
4	7 3/4	29.925	67.1	65.3	2 S	0 P haze	None	None; some clouds	None
5	7 3/4	29.943	58.5	49.0	0 calm	0	None	None	None
6	7 3/4	29.900	61.0	54.0	2 NW	0	None	None	None
7	7 3/4	30.160	58.9	48.9	2 NW	0	None	None	Aurora
8	7 1/4	30.304	58.6	49.0	1 SE	0	None	None	None
9	7 3/4	30.268	61.2	54.6	1 S	0	Moonlight	None	None
10	7 1/2	30.278	61.8	53.6	0 calm	0	Moonlight	Moonlight	None
11	8	30.172	64.7	58.2	1 S	1 R 7m	Moonlight	Moonlight	None
12	7 3/4	30.014	63.2	53.2	1 NW	0	Moonlight	Moonlight	None
13	10 1/2	30.216	52.9	42.1	1 N	0	Moonlight	Moonlight	None
14	6 3/4	30.057	60.8	53.8	1 S	0	Moonlight	Moonlight	None
15	6 1/2	29.892	62.8	57.7	0 calm	2 fog	Moonlight	Moonlight	None
16									Obsc.
17									Obsc.
18	7 3/4	30.200	56.5	43.8	1 SW	0	Moonlight	Moonlight	None
19									None
20	8	30.321	54.3	42.7	1 SE	0 haze	Moonlight	Moonlight	None
21									Obsc.
22									Obsc.
23	8	29.520	57.3	48.7	2 SW	9 Pm 7m	Cloudy	Visible	Aurora
24	7 2/3	29.880	50.3	37.4	3 NW	0 7m	None	None; some clouds	None
25	8	30.021	44.7	37.3	1 NW	0 7m	None	None; some clouds	Aurora
26									Obsc.
27	8	30.128	47.2	37.9	2 NW	9 P 7m	Cloudy	Cloudy	None
28	8	30.264	47.0	36.2	0 calm	5 P haze	Cloudy	Cloudy	None
29	8 1/3	30.234	46.8	38.1	0 calm	0 P haze	Slightly suspected	None	None
30						10 Pm			Blank
31						0			Blank

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October 1880.

1, 10¼ P.M. Day clear, cool; evening clear, rather hazy; clouds in the north at 9¾ P.M. and later; no aurora seen.

3, 9 A.M. Yesterday clear, rather warm; evening partly cloudy; no aurora seen.

4, 12½ A.M. Barometer 30.120; attached therm. 61.5; No. 4, 53.8. Yesterday rather clear and warm; evening somewhat hazy; no aurora seen up to present time.

5, 9 A.M. Yesterday warm, rather cloudy; evening cloudy after 8½ P.M., with some rain later; no aurora seen.

6, 9 A.M. Yesterday mostly cloudy, cool, with a little rain; evening clear till about 10 P.M., then cloudy; no aurora seen.

7, 9 A.M. Yesterday clear, rather warm; evening clear; no aurora seen.

8, 3½ A.M. Barom. 30.230; attached therm. 54.0; No. 4 38.5. Yesterday clear, rather cool; evening clear; low auroral arch 9 P.M. to midnight.

9, 1¼ A.M. Barom. 30.299; attached therm. 56.0; No. 4, 42.7. Yesterday clear, rather cool; evening clear; no aurora seen.

9, 11 P.M. Barom. 30.264; attached therm. 57.5; No. 4, 49.6. Day clear, rather warm; evening clear, somewhat hazy; no aurora seen.

11, 9¼ A.M. Yesterday clear, rather warm; evening foggy, cloudy at 11 P.M.; no aurora seen.

11, 11½ P.M. Barom. 30.135; attached thermometer 62.2; No. 4, 54.9; day clear, warm, with some thin clouds; evening clear; no aurora seen.

12, 10⅔ P.M. Day warm, cloudy towards noon; shower about 2¼ P.M., with a little thunder and lightning; clear after 4 P.M.; aurora slightly suspected at present (moonlight strong).

13, 10½ P.M. Day clear, cool; evening clear; no aurora seen. (Imperfect barometer observation, about 7 P.M.)

16, 1 A.M. Oct. 14 clear, cool; evening clear; no aurora seen. Barometer now 29.888; attached therm. 57.8; No. 4, 52.2.

16, 5¾ A.M. Barom. 29.910; attached therm. 56.1; No. 4, 48.4. Yesterday somewhat cloudy, clearer after noon; rather warm; some clouds in the evening [illegible]

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mostly clear; no aurora seen.

17, 9 A.M. Yesterday mostly cloudy, with a few drops of rain; evening cloudy.

18 9 A.M. Yesterday warm and cloudy, with some rain; evening cloudy, partly clear 11½ P.M.

18, 11⅓ P.M. Day clear, cool; evening clear; no aurora seen.

20, 9 A.M. Yesterday rather clear, cool; evening mostly cloudy; no aurora seen.

21, 9 A.M. Yesterday cool, rather cloudy; evening clear after 7½ P.M.; no aurora seen. White frost reported this morning.

22, 9 A.M. Yesterday becoming cloudy, cool; evening cloudy.

23, 9 A.M. Yesterday cloudy, with much rain and some wind in the evening.

24, 9½ A.M. Yesterday mostly cloudy, with a little rain, and in the afternoon a little thunder and lightning; evening clear till about 8 P.M., then mostly cloudy; auroral arch 7½ P.M. to about 9 P.M.

24, 11½ P.M. Day clear, rather cold, with passing clouds; evening clear; no aurora seen.

25, 11½ P.M. Day clear, cool; some clouds in the north in the evening; auroral light suspected, and about 9 P.M. irregular auroral streamers; none now.

27, 9 A.M. Yesterday cloudy, rather chilly, with a few drops of rain at times.

28, 9 A.M. Yesterday mostly cloudy, rather chilly; clear early in the evening, cloudy after 9 P.M.; no aurora seen.

29, 8¾ A.M. Yesterday cloudy at first, then clear; haze and clouds increasing in the evening; cloudy at 8½ P.M.; rather clear before 10 P.M.; no aurora seen.

29, 9¾ P.M. Day cool somewhat cloudy; much white frost this morning; evening nearly clear till about 9 P.M., then cloudy; no aurora seen.

Report to Signal Service, sent Nov. 2, 1880.

Aurora looked for every clear evening (no record for Oct. 30 and 31); Oct. 7, low arch 9 P.M. to midnight; Oct. 12, 10⅔ P.M., aurora slightly suspected (moonlight strong); Oct. 23, arch 7½ P.M. to about 9 P.M.; Oct. 25, auroral light suspected, and about 9 P.M. irregular auroral streamers; none at 11½ P.M.

Zodiacal light looked for every clear evening (no record for Oct. 30 and 31); slightly suspected Oct. 29, 8⅓ P.M.

Imperfect lunar halo Oct. 11, about 7 P.M.

Thundershowers; Oct. 12, shower about 2¼ P.M., with a little thunder and lightning; Oct. 23, a little thunder and lightning in the afternoon.

Frost; white frost mornings of Oct. 21 and 29; minimum thermometer below freezing point mornings of Oct. 25, 26, 29, 30.

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November 1880.

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	29.947	44.3	39.3	31.9	38.7	60.9	40.6	0		0 N.S.W.	1 Pm Fm	1
2	9	30.052	44.0	42.2	35.6	41.3	51.8	42.1			2 W	0	2
3	9 3/4	30.392	38.8	37.1	28.2	36.2	50.0	37.2	0		1 NW	1 Pm Fm haze	3
4	9	30.499	44.0	38.4	33.1	37.9	47.0	38.7	0		2 N	10 P	4
5	9	30.321	50.3	51.6	37.6	50.8	52.0	51.3	0		1 E	10 P	5
6	9	30.048	55.7	59.4	50.3	58.2	58.6	57.7	2 5/8	0.232	1 S	10 Pm	6
7	9 1/4	29.530	59.8	55.7	55.0	55.0	65.9	55.4	3 3/4	0.331	3 SW	0 M Fm	7
8	8 1/4	29.951	45.0	38.4	35.7	37.8	55.6	38.3	0		1 SW	0	8
9	9 1/4	30.176	46.8	44.5	36.7	43.7	50.0	44.2	0		0 calm	9 P R	9
10	9	30.351	43.9	40.9	35.5	40.0	56.6	40.6	0		1 N	0	10
11	9	30.052	49.1	49.1	39.8	48.1	50.7	49.0			2 E	10 Pm; a few drops of rain	11
12	9	29.903	49.2	47.1	41.5	46.1	55.5	47.0	4 3/4	0.419	2 W	0 P Fm	12
13	9	30.172	45.5	40.3	34.0	39.5	51.6	40.4	0		2 W	2 Pm Fm →	13
14	9 1/4	30.199	41.1	34.5	30.5	33.8	43.2	35.0	0		2 W	2 P R	14
15	9	29.841	42.0	35.0	30.9	34.5	40.8	35.7	0		1 S	10 Pm Fm →	15
16	9	30.058	35.3	28.9	25.3	28.0	37.7	29.5	0 1/2	0.044	1 SW	0	16
17	9	30.452	38.8	33.3	27.9	32.9	43.0	33.7	0		0 calm	9 P R Fm →	17
18	9 1/4	30.041	41.3	37.6	30.2	37.0	44.3	37.8	0		1 NW	10 P a little fog	18
19	9	30.255	33.6	25.9	21.3	25.0	47.8	26.5	0		2 NW	0 R	19
20	9	30.073	36.3	31.0	23.1	30.7	32.8	31.3	0		0 calm	10 R	20
21	9 1/2	31.018	32.5	25.1	24.0	24.3	44.2	26.0	1 1/4	0.993	3 W	0 M	21
22	9	30.402	25.4	16.3	13.6	15.3	27.8	17.2	0		2 NW	0	22
23	9 1/2	30.381	25.0	16.2	10.6	15.2	22.4	17.0	0		2 NW	0	23
24	9 1/4	30.582	22.3	17.2	10.5	16.2	23.4	18.0	0		2 NW	0	24
25	9 1/4	30.250	31.8	28.2	16.2	27.2	28.5	28.4	0 1/2	0.044	0 calm	10 P a little snow	25
26	9	30.366	23.7	14.3	10.5	13.6	31.3	15.8	0		2 NW	0	26
27	9 1/4	30.337	26.0	16.5	9.0	16.0	24.0	17.5	0		1 N	2 P R Fm haze	27
28	9 1/4	30.270	28.3	20.0	14.4	19.4	31.3	21.0	0		0 calm	9 P haze	28
29	9 1/4	29.790	33.7	32.1	19.3	31.7	32.0	32.1	0 3/8	0.033	1 SW	8 P R Fm →	29
30	9 1/4	30.230	31.0	23.3	21.0	22.5	41.4	24.0	0		1 N	0 P R	30
	9.1	904.919 30.164 -.028 30.136	1164.5 38.8	1019.4 34.0	833.2 27.8	996.6 33.2	1302.1 43.4	Max. set inside building.	23 3/4	2.096 Rainfall for month 2.10 inches	39 1.3	123 4.1	

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November 1880.

Date	Time P.M.	Barometer	Attached Thermometer	No. 4	Wind.	Clouds.	Zodiacal light.	Aurora.	Report to Signal Service
1									None
2	8½	30.231	48.8	40.2	1 N	0 haze	Suspected	None	Aurora
3	8 5/6	30.414	46.4	38.5	1 NE	4 Pm haze	Clouds and haze	Suspected among clouds	Aurora
4									Obsc.
5									Obsc.
6									Obsc.
7									None
8	8¼	30.057	49.8	40.2	0 calm	0	Moonlight	Moonlight	None
9	8	30.280	52.8	46.8	0 calm	0 7m	Moonlight	Moonlight	None
10	7	30.296	51.7	43.3	1 SE	4 P 7m haze	Moonlight & clouds	Moonlight & clouds	None
11	8¼	29.787	54.0	51.7	1 SW	0	Moonlight	Moonlight	None
12	8	30.045	49.8	44.8	3 W	8 Pm 7m →	Cloudy	Cloudy	None
13									Obsc.
14									Obsc.
15									Obsc.
16	8½	30.286	42.5	34.9	1 SW	0	Moonlight	Moonlight	None
17	11½	30.334	43.9	37.2	0 calm	9 Pm 7m ↑	Cloudy	Cloudy	None
18	7	29.960	44.1	35.9	3 NW	0 P	Moonlight	Moonlight	None
19	8½	30.266	38.0	25.7	1 W	0 P	Moonlight	Moonlight	None
20	7½	29.576	41.4	41.3		10 P; raining	Cloudy	Cloudy	None
21	6¼	30.182	26.9	25.0	2 W	0	Suspected	None	None
22	7¼	30.393	25.8	17.6	1 W	0	Faint	None	None
23	7¼	30.380	26.0	17.7	2 NW	0	Perceptible	None	None
24									Obsc.
25									None
26	8½	30.395	32.0	19.1	1 NW	2 7m haze	Clouds	None	None
27	7½	30.318	32.4	25.4	1 N	0 P	Perceptible	None	Aurora
28									Obsc.
29	7	29.871	37.9	35.2	1	1 P haze	Perceptible	None	None
30	7	30.227	34.5	26.1	1 SE	0	Perceptible	None	Aurora

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November 1880.

2, 9 A.M. Yesterday mostly clear, cool; evening mostly cloudy till after 9 P.M.; nearly clear about 10 P.M.; no aurora seen.

2, 11 5/6 P.M. Day clear, cool; evening clear; auroral arch 8 5/6 P.M. and later, sky dark below; streamers at times at 11 P.M. and later.

3, 11 P.M. Day rather cool and clear; evening rather foggy, with clouds at times near horizon; aurora at 4 5/6 A.M.; also 6 1/2 to 7 P.M. and about 9 P.M., with streamers; suspected among clouds at other times also.

5, 9 A.M. Yesterday rather cloudy; cool; evening cloudy.

6, 9 A.M. Yesterday cloudy with a little rain at times; evening cloudy.

7, 9 1/2 A.M. Yesterday cloudy with a little rain during the day and more in the evening.

8, 1 5/6 A.M. Barom. 29.856; attached therm. 50.6; No. 4, 40.7. Yesterday mostly clear, cool; evening mostly cloudy 7 to 10 P.M.; no aurora seen.

9, 9 1/4 A.M. Yesterday clear, cool; evening clear; no aurora seen.

10, 9 A.M. Yesterday cloudy at first, afterwards clear, rather warm; evening clear; no aurora seen.

11, 9 A.M. Yesterday rather clear; growing cloudy during the evening; no aurora seen.

12, 9 A.M. Yesterday cloudy with some rain; evening rather clear, with many passing clouds; no aurora seen.

13, 9 A.M. Yesterday mostly clear, growing cool; evening partly clear, with many passing clouds; no aurora seen.

14, 9 1/4 A.M. Yesterday mostly cloudy, cool; evening cloudy; moon visible through clouds.

15, 9 A.M. Yesterday mostly clear, cool; thin clouds towards night, increasing during the evening; rather bright lunar halo 7 to 8 P.M.; Jupiter on inner edge of halo.

16, 9 A.M. Yesterday cloudy, with a little snow after noon; evening cloudy.

16, 6 P.M. Barom. 30.204; attached therm. 45.4; No. 4, 38.6

16, 11 3/4 P.M. Barom. 30.345; attached therm. 41.2; No. 4, 30.9. Day clear, cool; evening clear; no aurora seen.

17, 11 1/2 P.M. Day rather clear; clouds increasing towards night; evening mostly cloudy, rather clear for a time at 11 P.M.; no aurora seen.

19, 9 A.M. Yesterday cloudy beginning with rain towards night; clear

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soon after 6 P.M. and later; no aurora seen.

19, 10¼ P.M. Day mostly clear, rather cold; clouds came on from the South at 9½ P.M.; zodiacal light slightly suspected at 6 P.M.; no aurora seen.

21, 9½ A.M. Yesterday cloudy; afternoon rainy; evening cloudy, clearing off about 11 P.M.; no aurora seen.

22, 9 A.M. Yesterday, clear, cold, rather windy; evening clear; no aurora seen; zodiacal light strongly suspected; vertex near faint branch of Milky Way from the Pleiades to Aquila, which was well seen.

23, 9½ A.M. Yesterday clear, cold; evening clear; no aurora seen; zodiacal light as previous day.

24, 9¼ A.M. Yesterday clear, cold; evening clear; no aurora seen; zodiacal light as last two days.

25, 9½ A.M. Yesterday clear, cold, becoming cloudy and chilly; evening somewhat clear, clouds thickening. A little snow soon after midnight, and this morning.

26, 9 A.M. Yesterday cloudy, with a little snow early, clearing off in the evening; no aurora seen.

27, 9½ A.M. Yesterday clear, cold; occasional haze and clouds in the evening; no aurora seen.

27, 10½ P.M. Day rather cold, somewhat cloudy; evening nearly clear; faint aurora now over dark sky.

29, 9¼ A.M. Yesterday cloudy, chilly, with a little fine rain and mist towards night.

30, 9¼ A.M. Yesterday somewhat cloudy; evening nearly clear; no aurora seen.

Dec. 1, 9½ A.M. Yesterday mostly clear, cool; haze thickening in the evening; mostly cloudy at 10½ P.M.; auroral arch over dark sky 8 to 10 P.M.; streamers among clouds later; some also reported before 8 P.M.

Report to Signal Service, sent Dec. 1, 1880.

Aurora looked for every clear evening; Nov. 2, auroral arch 8⅚ P.M. and later, sky dark below; streamers at times at 11 P.M. and later; Nov. 3, aurora at 4⅚ A.M.; also 6½ to 7 P.M. and about 9 P.M., with streamers; suspected among clouds at other times also; Nov. 27, faint aurora over dark sky at 10¼ P.M.; Nov. 30, auroral arch over dark sky 8 to 10 P.M.; streamers among clouds later; some streamers also before 8 P.M.

Zodiacal light looked for every clear evening; suspected Nov. 2, 21; perceptible Nov. 22, 23, 27, 29, 30; observations on other evenings hindered by moonlight or clouds.

Lunar halo, rather bright, 7 to 8 P.M. Nov. 15.

Frost; minimum thermometer below freezing point mornings of Nov. 1, 3, and 14 to 30 inclusive.

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December 1880.

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	9½	29.802	32.0	32.0	21.0	31.7	31.9	31.9	Snow fr. 48		2 SE	10 P; snowing	1
2	9¼	29.728	32.1	23.6	19.1	23.0	33.0	24.6		1.318	0 calm	2 P; a few snowflakes	2
3	9	29.951	28.5	22.4	17.0	21.5	28.0	23.0	0		2 W.	0	3
4	9	30.018	28.3	22.9	18.0	22.1	29.4	23.6	0		1 W	9 R Rs	4
5	9	29.938	30.0	25.3	15.3	24.2	31.6	25.7	0		0 calm	10 R fog	5
6	9½	29.708	36.1	37.9	24.3	37.0	39.0	37.9	5¾	0.505	1 SW	10 R 7m	6
7	9¼	29.655	34.6	27.8	27.1	27.1	40.0	28.0	0		1 NW	1 P 7m	7
8	9	29.934	22.8	13.7	10.8	12.9	29.9	14.9	0		0 calm	10 R	8
9	9¼	30.218	21.2	12.7	9.0	12.0	23.0	18.8	0		1 W	0	9
10	9¼	30.241	24.5	14.7	11.4	13.8	22.0	15.7	0		2 NW	10 R ja little snow	10
11	8¾	30.210	21.0	11.8	6.1	10.9	21.0	12.9	0⅛	0.011	2 N	3 R Rs	11
12	10½	29.838	25.8	24.9	10.9	24.3	25.0	25.0	0		1 NW	9 P 7m →	12
13	9	29.631	31.3	30.2	24.2	29.5	33.3	30.2	0		0 calm	9 P fog	13
14	9	29.831	34.0	32.2	29.3	31.8	40.2	32.6	0		1 W	2 P R 7m	14
15	9¼	29.499	38.2	38.2	31.3	37.2	39.0	38.0	4¼	0.375	2 SW	0 P 7m	15
16	9¼	29.616	35.0	33.2	30.3	32.6	40.0	33.1	0		2 W	2 P Rs 7m →	16
17	9	29.672	23.9	18.7	17.0	18.1	34.4	19.2	0		2 W	0 P.	17
18	9	29.660	26.8	17.2	13.9	16.2	25.2	18.2	0		2 NW	0 P Rs	18
19	9¼	29.728	20.0	19.3	13.8	18.3	23.2	19.4	0		2 NW	0 Rs R	19
20	9	30.049	25.3	23.5	18.2	22.8	33.0	23.9	0		1 N	7 P Rs	20
21	9	29.828	31.2	32.4	22.6	31.9	32.7	32.2	0		2 NE	10 P	21
22	9¼	29.933	28.0	27.3	22.6	26.3	32.2	27.2	0		2 N	3 Rs 7m	22
23	9	30.140	25.0	23.1	19.3	22.3	35.0	23.6	0		1 NW	0	23
24	9½	30.326	31.3	28.6	22.3	27.9	35.0	28.8	0		1 N	10 P	24
25	9	30.354	32.7	28.7	27.2	28.0	32.5	28.9	0⅛	0.011	1 NE	10 P	25
26	8½	30.100	31.5	35.1	24.0	34.3	35.2	35.0	0¼	0.022	3 E	10 P	26
27	9	29.579	31.7	28.2	27.0	27.7	35.5	28.5	Snow fr. 49	0.100+	3 N	10 P; snowing	27
28	9	29.648	29.0	22.0	21.3	21.3	32.0	22.3	0		2 W	0 Rs	28
29	9	29.820	23.8	12.6	10.5	11.8	22.6	14.7	See fr. 49		0 calm	10 P; snowing	29
30	8¼	29.634	out 1 night est. 10.0	−2.6	−2.8	−2.8	16.0	0.0		0.467	2 SW	0	30
31	9	30.143	out 1 night est. 5.0	−1.6	−4.5	−1.8	4.8	1.0	0		1 SW	0	31
	9.1	926.4 52 29.886 4.003	85 0.6 27.4	716.0 23.1	557.5 18.0	693.9 22.4	936.0 30.2	Max. set outside	See fr. 48, 49.	2.806 Rainfall for	43 1.4	157 5.1	

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December 1880.

Date	Time P.M.	Barometer	Attached Thermometer	No. 4	Wind	Clouds.	Zodiacal light.	Aurora.	Report to Signal Service
1	7½	29.680	33.3	22.2	2 N	10 P_s.	Cloudy	Cloudy	Obsc.
2	6½	29.842	29.8	19.5	2 NW	8 P	Cloudy	Cloudy	Obsc.
3	7¼	29.984	33.6	24.1	1 SW	0 Phaze	Perceptible	None	None
4	7½	30.071	34.3	25.7	0 calm	0	Perceptible	None	None
5									Obsc.
6									Obsc.
7	7	29.784	34.9	22.9	2 NW	0	Moonlight	Moonlight	None
8									Aurora
9	7¼	30.256	24.2	16.4	0 calm	0 Rs	Moonlight	Moonlight	None
10	6¾	30.189	25.9	18.0	3 N	10 P_s snowing	Cloudy	Cloudy	None
11	10¾	29.920	26.5	19.8	1 S	2 P_s Rs	Moonlight	Moonlight	None
12									Obsc.
13									Obsc.
14									Obsc.
15									Obsc.
16	5¾	29.596	35.3	29.5	2 NW	0 7m	Moonlight	Moonlight	None
17	6½	29.700	31.1	21.3	1 NW	0	Moonlight	Moonlight	None
18	5¾	29.612	28.2	20.0	2 NW	0 Rs	Twilight {see Mi. 48, 49}	None	None
19	6¼	29.859	32.0	28.5	2 NW	0	Distinct {see T. 49}	None	None
20	~~7~~	~~30.016~~	~~31.8~~						Obsc.
21									Obsc.
22	7¼	30.016	31.8	27.7	2 N	0	Visible	None	Aurora
23	7¼	30.196	34.0	29.8	1 N	0	Visible	None	None
24									Obsc.
25									Obsc.
26									Obsc.
27									Obsc.
28	7¾	29.820	22.3	13.7	0 calm	2 P haze	Visible	None	None
29	6	29.535	26.3	12.2	1 N	10 P_s snowing	Cloudy	Cloudy	Obsc.
30	6½	29.852	out of sight ext. 10.0	1.3	1 SW	0 haze	Visible	None	None
31	6¾	30.116	19.8	7.14	1 SW	0	Visible	None	None

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December 1880.

1, 9½ A.M. Snow 3 inches deep; probably began falling early this morning.

1, 7½ P.M. Snowing moderately most of the day, not now; gauge cleared out.

2, 9¼ A.M. Snow 6, 6, 8, 8, 7½, 6, 7, 7, 7, 7½; mean 7.0 inches. Yesterday evening cloudy.

2, 11¼ A.M. Snow in cylinder 1⅞ inches across: 22½ inches weigh 6¾ oz. log 6.75 0.8293 9.2748 0.1883 inches to 1 inch of snow
anc. log 22.5 8.6478 1.3451
9.7977 0.1197 1.318 rainfall.

3, 9 A.M. Yesterday mostly clear, cold; evening mostly cloudy; no aurora seen.

3, 10½ P.M. Day mostly clear, rather cold; evening mostly clear; no aurora seen.

5, 9 A.M. Yesterday cloudy at first, becoming clear; evening clear; no aurora seen.

6, 9¼ A.M. Yesterday cloudy, with snow after 9 A.M. and rain later; evening cloudy.

7, 9¼ A.M. Yesterday mostly cloudy, thawing; evening cloudy with a few snowflakes.

8, 1¼ A.M. Barom. 29.868; attached therm. 29.2; No. 4, 15.7.

6 29 53 nearly 13 20 0
31 19.5 conv.
34 6.0 conv.
34 54 (nearly) 13 25 0

} Comparison of B 236 & B 394; see another comparison in book R 56.

Aurora reported by Mr. Wendell about 12½ A.M., lasting only a short time. Yesterday mostly clear, cold; evening clear; no aurora seen before midnight.

9, 9½ A.M. Yesterday mostly somewhat cloudy; evening partly clear; no aurora seen.

9, 11¾ P.M. Day clear, cold; clouds increasing after 9 P.M.; no aurora seen.

11, 10 A.M. Yesterday mostly cloudy, cold, with a little snow early, and also after 6 P.M.; clear for a time after 5 P.M.; no aurora seen. Snow not measurable except by gauge, but doubtless more than gauge makes it.

12, 2 A.M. Barom. 29.878; attached therm. 26.4; No. 4, 16.8. Yesterday mostly cloudy, rather cold; clear about 10 P.M. and later; no aurora seen.

13, 9 A.M. Yesterday cloudy, cool; evening cloudy.

14, 9 A.M. Yesterday mostly cloudy, thawing; evening cloudy.

15, 9¼ A.M. Yesterday rather cloudy, thawing; evening cloudy, with rain after 10½ P.M.

16, 9¼ A.M. Yesterday clear at first, cloudy towards night; evening cloudy; partly clear at 11½ P.M.; no aurora seen.

16, 10⅓ P.M. Day rather cold; somewhat cloudy; clear after 5 P.M.; no aurora seen.

18, 9 A.M. Yesterday clear, cold; evening somewhat cloudy after 9 P.M.; no aurora seen.

19, 9½ A.M. Yesterday clear, cold; evening clear; no aurora seen. Diagonal light

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distinct between twilight and moonrise.

19, 6¼ P.M. From 5h 55m to 6h 5m P.M. the dark space between the zodiacal light and the band from Aquila to the Pleiades was thought to be discernible along the line from δ Aquilae to β Aquarii ~~[illegible]~~, at places where no stars interfered with the observation.

20, 9 A.M. Yesterday nearly clear, cold; evening clear; no aurora seen.

21, 9 A.M. Yesterday rather cloudy, cool; evening cloudy.

22, 9¼ A.M. Yesterday cloudy, cold, with a few snowflakes; evening cloudy.

22, 10½ P.M. Day clear, rather cold; evening clear; aurora slightly suspected about 8½ P.M.

24, 9½ A.M. Yesterday clear, cool; evening clear till 11 P.M., then growing cloudy; no aurora seen.

25, 9 A.M. Yesterday cloudy, with a few snowflakes; evening cloudy.

26, 8¾ A.M. Yesterday cloudy, cool; evening cloudy; a little snow or rain this morning.

27, 9 A.M. Yesterday cloudy, cool, with a little snow; evening cloudy; a little snow early today; much drifted; perhaps 1 inch at present.

27, 3¾ P.M. Snow ceased soon after 9 A.M.; gauge at this time 0¼ ounces, or 0.022 inches; probably nearer 0.1 inches in fact; but there are no means of measuring exactly.

28, 9 A.M. Yesterday cloudy, cool; evening cloudy.

29, 9 A.M. Yesterday partly clear; evening somewhat clear after 6, haze thickening later; thick at 10 P.M.; no aurora seen.

29, 6 P.M. Snowing a little all day; snow about 0½ inches deep at 9 A.M., about 1½ inches now.

30, 12¾ P.M. New snow measured in 5 places: 4, 4¼, 4¼, 4¼, 4½; mean 4.25 inches; 20 inches in cylinder 1⅞ inches across weigh 3½ oz. Gauge cleared out.

log 3.5 0.54441
ar. co. log 20 8.69901
9.24342

as 1 in. Snow 0.0985 inches 8.99342
log 4.25 0.62842
0.467 rainfall 9.66892

Yesterday evening cloudy with snow as late as 11 P.M.

31, 9 A.M. Yesterday clear, cold; evening clear; no aurora seen.

1881 Jan. 1, 9¼ A.M. Yesterday clear, cold; evening clear; no aurora seen.

Report to Signal Service, sent Jan. 1, 1881.

Aurora looked for every clear evening: seen about 12½ A.M. Dec. 8 for a short time; slightly suspected about 8½ P.M. Dec. 22.

Zodiacal light looked for every clear evening; visible Dec. 3, 4, 18, 19, 22, 23, 28, 30, 31; observations on other evenings hindered by clouds or moonlight.

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General remarks on Observations for 1880.

Range of temperature.

Range of temperature for separate Months.

January	56.1 to 5.0	degrees Fahrenheit;	Jan. 29 & 14.
February	58.7 " −3.9	" " ;	Feb. 19 & 10.
March	65.6 " 13.8	" " ;	March 6 & 9.
April	72.2 " 22.1	" " ;	April 16 & 8.
May	91.9 " 33.7	" " ;	May 27 & 1.
June	93.9 " 47.0	" " ;	June 29 & 10.
July	93.3 " 51.8	" " ;	July 11 & 31.
August	87.4 " 42.4	" " ;	Aug. 24 & 27.
September	86.8 " 39.5	" " ;	Sept. 6 & 24.
October	74.6 " 25.2	" " ;	Oct. 13 & 29.
November	65.9 " 9.0	" " ;	Nov. 7 & 27.
December	40.2 " −4.5	" " ;	Dec. 14 & 31.

Readings of the maximum and minimum thermometers Casella 13399 and Green 2205, without reduction; time of observation about 9 A.M.

For the year; 93.9 June 29 to −4.5 December 31.

Range of barometer: January 29, 7¼ P.M., barometer 30.662; attached thermometer 33.7; February 3, 6⅓ P.M., barometer 28.974; attached therm. 30.9.

Observers; and times of observation: A. Searle usually; F. Waldo Aug. 4 to 28 inclusive; also Oct. 30, 31, and Nov. 1. (An observation of aurora by O. C. Wendell Dec. 8). Observations made about 9 A.M., and occasionally on clear evenings; time recorded for each occasion.

Instruments: Barometer J. Newman No. 68; external thermometer No. 41; maximum thermometer Casella 13399; minimum thermometer Green 2205; vane; rain gauge; all as described in book Q5, pages just before the record for 1878. The ground where the rain gauge is placed was lowered about a foot by regrading in October, 1880, and the gauge reset approximately as before. The place of the thermometers is as after June 10, 1879; see book Q5, p. 72.

Wind: Direction estimated by vane; force on a scale of 10, not, as in previous years, in miles per hour. The scale is intended to conform to that of the Signal Service in which

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0 signifies calm
1 light breeze, 1 to 2 miles an hour.
2 gentle breeze, 3 to 5 " " "
3 fresh breeze, 6 " 14 " " "
4 strong wind, 15 " 29 " " "
5 high wind 30 " 39 " " "
6 gale 40 " 59 " " "
7 strong gale 60 " 69 " " "
8 violent gale 70 " 79 " " "
9 hurricane 80 " 99 " " "
10 most violent hurricane, 100 " " " or more.

This system adopted February 1; no systematic record for January.

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 The barometric means reduced to the freezing point are entered below the uncorrected means; no other corrections are applied.

Reports to Signal Service Since July, 1877, reports have been made monthly to the U.S. Signal Service Office at Washington, relating mainly to aurora and zodiacal light. Copies of these reports on separate sheets of the same kind as those sent to Washington were kept at this Observatory till April, 1880; after that time, the information sent is entered in the record in this book, and no other copy made.

Phenomena Although the rainfall has not been remarkably deficient, and there has been moisture enough for vegetation, the level of the ponds in this neighborhood has fallen very much. This is partly due, perhaps, to an increased use of the water from ponds. The bay at the northeastern part of Fresh Pond was dry at the close of 1880.

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January 1881.

Date.	Time.	Barometer	Attached Thermometer	No. 11	Minimum before and after setting.	Maximum before and after setting.	Gauge.	Rainfall in inches.	Wind.	Clouds.
1	9 1/4	30.182	Out of sight est. 15.0	1.0	−6.0	0.6	13.5	3.5	0	1 W	0
2	9 1/2	30.124	Out of sight est. 15.0	6.9	−1.4	6.2	14.2	8.5	0	1 NW	10 P_2
3	9	29.978	18.7	15.6	6.2	14.7	21.3	16.5	0	1 SW	.5 P R_m 7m →
4	9 1/4	30.238	Out of sight est. 15.0	11.1	8.5	10.2	32.6	12.0	0	2 N	9 P_2
5	9 1/2	29.936	24.8	20.8	10.2	20.1	23.2	21.4	see p. 55	0.280	1 N	10 P_2
6	9 1/4	29.647	28.5	26.3	20.1	25.8	29.0	26.7		1.117	2 N	10 R; snowing
7	9 1/2	29.862	34.2	34.1	25.7	33.3	34.8	34.0	0 3/4	0.066	2 W	0 Rs 7m haze
8	9 1/2	30.360	27.8	16.9	12.0	16.2	38.0	18.0	0		1 NW	0 Rs 7m
9	9 3/4	30.454	17.8	5.8	−1.7	5.2	24.2	8.0	0		1 N	0 P Rs
10	9 1/4	29.800	31.3	36.7	5.2	36.0	36.2	36.0	17 1/2	1.544	2 NE	10 P raining
11	9 1/4	30.037	29.0	22.6	21.2	22.0	39.0	23.3	0 sec. 55	0.794	1 NW	8 P_2 7m
12	9	29.905	26.8	18.3	17.2	17.4	28.0	19.0	0		1 NW	0 P Rs
13												
14	9 3/4	29.587	34.3	39.1	13.6	38.3	39.5	38.5	0		2 SE	10 P
15	9	29.958	17.8	7.6	5.6	7.0	41.3	9.0	1 1/2	0.132	2 N	0
16	9 1/4	30.081	21.0	15.5	6.9	15.1	18.8	16.9	0		1 NW	10 P 7m
17	9	30.152	27.1	23.5	15.0	22.9	29.3	24.0	0		0 calm	10 P 7m →
18	9 1/4	30.495	25.4	18.3	14.3	17.5	35.5	19.0	0		2 NW	0
19	9	30.224	26.3	19.2	15.3	18.7	28.5	20.0	0		1 SW	10 P 7m →
20	9 1/4	29.972	26.2	17.7	13.0	16.8	31.0	18.5	0 1/2	0.044	1 W	0
21	8 3/4	29.876	26.8	18.6	15.0	18.1	32.1	19.5	0		1 N	10 P_2
22									see p. 56	3.349		
23	9	29.720	28.8	20.7	17.3	20.0	34.8	23.0	0		2 SW	6 P_2 R_s 7m →
24	9	29.994	22.0	9.8	7.7	9.0	26.2	11.2	0		2 W	0
25	9 1/4	30.012	21.4	7.9	2.1	7.3	22.0	10.0	0		1 W	0
26	9 1/4	29.934	22.9	15.7	7.2	14.9	23.0	16.7	0		2 SW	9 P 7m →
27	9 1/4	29.869	24.3	16.6	14.1	15.6	24.3	17.2	0		2 NW	0 R_s
28	10	29.998	Out of sight est. 15.0	5.3	2.5	4.7	17.3	7.0	0		2 NW	0 R_s
29	9 3/4	30.111	Out of sight est. 12.0	7.9	2.8	7.3	9.0	9.0	0		3 NW	0
30	9 1/2	30.046	Out of sight est. 12.0	6.1	3.1	5.5	13.8	8.0	0		1 NW	10 R; snowing
31	9 1/4	30.035	19.0	13.3	5.5	12.5	16.0	14.2	0 1/2; see p. 59	0.107	1 NW	6 P 7m →
	9.3	870 30.587 30.020 +.015 30.035	666.2 23.0	417.9 16.5	258.2 8.9	458.9 15.3	776.4 26.8	Max. set inside building.	See p. 55, 56, 59	7.433 Rainfall for month	42 1.4	143 4.9

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January 1881.

Date.	Time P.M.	Barometer.	Attached Thermometer.	No. 4.	Wind	Clouds.	Zodiacal Light.	Aurora.	Remarks & Signal Service
1	6½	30.236	20.2	8.1	0 calm	0	Distinct	None	None
2									None
3	9½	30.036	27.2	24.4	1 W	4 P Zm	Cloudy	None	None
4									Obsc.
5									Obsc.
6									Obsc.
7	10½	30.136	33.4	23.9	1 W	0	Moonlight	Moonlight	None
8	8¼	30.420	24.8	14.5	1 N	0	Moonlight	Moonlight	None
9									Obsc.
10	8⅔	29.784	33.9	32.4	2 NW	1 PRs Zm	Moonlight	Moonlight	None
11	~~8⅔~~	~~29.970~~	~~27.9~~						Obsc.
12	8⅔	29.970	27.9	17.6	0 calm	0	Moonlight	Moonlight	None
13									Obsc.
14									Obsc.
15	9	30.048	21.6	11.7	1 NW	1 Pr Rs	Moonlight	Moonlight	None
16	9½	30.124	28.1	22.5	1 N	1 Pr Rs	Moonlight	Moonlight	None
17	8½	30.304	31.7	26.5	1 SW	0	Moonlight	Moonlight	None
18	8¾	30.418	28.8	21.0	0 calm	0	Moonlight	Moonlight	None
19	8½	30.011	30.0	25.8	0 calm	8 P haze	Cloudy	Cloudy	None
20	9¼	29.944	32.3	23.3	1 SW	0	Visible	None	None
21	7¼	29.442	31.9	32.0	3 NE	10 P; snowing	Cloudy	Cloudy	Obsc.
22	8½	29.651	31.0	27.2	1 W	10 P	Cloudy	Cloudy	Obsc.
23	8	29.764	29.4	19.0	2 W	3 P	Cloudy	{Noticeable clouds} see p. 57, line 16.	Aurora
24	9	30.006	27.1	13.7	1 W	0	Visible	None	None
25	8½	30.013	26.8	15.9	2 W	0	Visible	None	None
26	8¾	29.850	27.2	18.1	1 SW	9 P	Cloudy	Cloudy	None
27	8½	29.912	21.5	7.9	1 SW	0	Visible	None	None
28	9	30.030	[illegible]	5.5	3 NW	0	Visible	None	None
29	8¼	30.121	[illegible]	8.0	2 W	2 P haze	Cloudy; visible early in	None; haze	None
30									Obsc.
31	9	30.095	21.0	15.7	2 NW	5 P haze	Cloudy	Dark arch among clouds	Aurora

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January 1881.

1, 10 P.M. Observed the region about the ecliptic following its intersection with the Milky Way in Taurus & Gemini with some care during the past hour. There is an extension of the Milky Way to Praesepe, which I have often noticed before, but the exact outline of this extension is doubtful. There seems to be a dark channel from Procyon to Castor and Pollux, which near Procyon may be only due to the presence of the star; but half way from Procyon to Castor and Pollux there cannot be much doubt of its existence. Again, beyond Praesepe, the ecliptic appears dark, the sky below, in Leo, being somewhat generally light, from its low altitude, but not lighter on the ecliptic than elsewhere. This evening it seemed to be possible that there was a slight illumination of the dark space between Procyon and Castor, due (theoretically) to Gegenschein. It is to be noted whether later in the season there is any illumination of the ecliptic between Praesepe and Leo. See note below, Jan. 4; also see Dien's Atlas of the D.M.; it is evident that there is an accumulation of stars where the ecliptic crosses the line from Procyon to Pollux.

2, 9½ A.M. Yesterday clear, cold; evening clear, growing hazy and cloudy after 10 P.M.; no aurora seen.

3, 9 A.M. Yesterday rather cloudy and cold; clouds thin; evening mostly rather clear with some clouds; no aurora seen; appearance of region near Praesepe at 11 P.M. as on Jan. 1.

4, 9½ A.M. Yesterday partly cloudy, chilly, clear towards night; clouds at times in the evening; no aurora seen. Region near Praesepe examined for some time at midnight. Observed that the darkness between Procyon and Pollux is certainly not continuous; it is perhaps plainest half way between the stars, less so nearer Pollux, but still nearer Pollux the sky is again comparatively dark. On comparison with Dien's Atlas, plate 11, I find that this appearance

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by supposing the stars distributed on the whole in the same way as those which have been catalogued. Observed also that a faint belt of light seemed to run from Praesepe to
o Leonis, then to d Hydrae, thence to Procyon, enclosing a darker space about the head of Hydra. No distinct belt of light along the zodiac into Leo beyond o Leonis. Sky in Leo generally pale; will need observation when higher. At the same time, the belt from the Pleiades downwards was obvious as usual; more readily recognized than the faint markings above described on the opposite side of the Milky Way. See D.M. maps 4 & 16 for region between Procyon and Pollux; although the division between two maps makes comparison more difficult, the appearance in general agrees with Dien's Atlas. See also D.M. maps 5 & 17 for other streams above noticed.

5, 9 ½ A.M. Yesterday cloudy, rather cold, with snow in the evening. Snow this morning 2 ½ inches deep, uniform. 21 inches in cylinder 9 7/8 inches across weighs 3 ¾ ounces. Gauge cleared out.

ar. co. log 21 8.6778 9.0495 0.1120 inches to 1 inch snow
log 3¾ 0.5740 0.5279
9.1977 9.4474 0.280 rainfall

6, 9 ¼ A.M. Yesterday cloudy, cool; evening cloudy. About 4 ½ inches of new snow this morning.

6, 1¾ P.M. New snow at 1 P.M. about 6 ½ inches deep, apparently pretty uniform; 21 inches in cylinder 1 7/8 inches across weighs 5¾ oz.; gauge cleared out.

ar. co. log 21 8.6778 9.2362 0.1719 inches to 1 inch snow.
log 5¾ 0.7597 0.8129
9.1971 0.0481 rainfall 1.117 inches.

7, 9 ½ A.M. Snow yesterday ceased before noon; a little fine rain later; evening cloudy.

8, 12 ¼ A.M. Yesterday clear with a few clouds; cool; evening clear; no aurora seen.

9, 9¾ A.M. Yesterday clear, rather cold; evening clear; no aurora seen.

10, 9 ¼ A.M. Yesterday clear, cold, becoming cloudy and warmer; snow in the evening, rain later in the night.

10, 4 P.M. Rain ceased about noon; gauge examined at this time; 9 ounces, or 0.794 inches.

10, 9¾ P.M. Lunar halo; β Persei on inner edge. Day cloudy, chilly with rain early; clearing off about 6 ½ P.M.; clouds increasing after 8¾ P.M.

12, 9 A.M. Yesterday mostly cloudy, cool; evening cloudy.

13, 1¾ A.M. Barom. 29.978; attached therm. 27.0; No. 11, 11.5. Yesterday clear [illegible] evening clear; no aurora seen.

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January, 1881.

14, 9¾ A.M. Yesterday clear, thawing, growing cloudy; evening cloudy, with occasional clear patches.

15, 9 A.M. Yesterday cloudy and warm, with some rain after noon; evening cloudy, beginning to clear off after 10 P.M.

16, 9½ A.M. Yesterday clear, cold; thin clouds at 9 P.M., thickening later; no aurora seen.

16, 9½ P.M. Day somewhat cloudy, thawing; evening partly clear, with thin clouds; no aurora seen; fragmentary lunar halos this and yesterday evening.

17, 11 P.M. Day cloudy with a few snowflakes in the forenoon; afternoon and evening clear; no aurora seen; Zodiacal light visible before moonrise.

18, 11½ P.M. Day clear, rather cold; some light clouds after 9½ P.M., increasing later; no aurora seen; zodiacal light distinct before moonrise.

20, 9¼ A.M. Yesterday cloudy with a little snow about 10 A.M. and later in the forenoon; growing clear in the evening; clear about 10 P.M.; no aurora seen. Some uncertainty about minimum reading this morning; it was not set down at first, by mistake; reading 13.0 as remembered a few minutes later.

20, 6⅔ P.M. β Urs. Min. 2 α Urs. Min.; α Urs. Min. 1 ε Urs. Maj.; α Urs. Min. 3 γ Cass. (Entered later in the evening in the regular book).

21, 8¾ A.M. Yesterday clear, cool; evening clear; no aurora seen; zodiacal light conspicuous early in the evening.

22, 12¾ P.M. Snow ceased before morning, and the clouds partly cleared off; closing again later; a few snowflakes now. Depth of new snow by 10 measures: 14, 15, 13¾, 15, 15½, 17, 16½, 10, 13¼, 16¾; mean 14.675 inches; 22 inches of this snow taken partly from the bottom layers, in cylinder 1⅞ inches across, weigh 8 ounces; hence rainfall to 1 inch [illegible]

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cleared out. Barometer 29.552; attached therm. 29.3;
No. 4, 24.8.

22, 8½ P.M. Yesterday cloudy, with snow after noon, wind strong towards night; today mostly cloudy with a few snowflakes; evening cloudy.

24, 9 A.M. Yesterday rather clear and cold; evening partly cloudy; no aurora seen.

24, 11¼ P.M. Day clear, rather cold; evening clear, very slightly hazy; aurora occasionally suspected. Dark space about neck of Hydra (the head touches the lighter sky above) bounded about as described top of p. 55; but sky below α Hydrae somewhat hazy; certainly no more light anywhere between α and β Leonis than north and south of the line between them, if as much. At the same time, band downwards from Pleiades evident. Zodiacal light conspicuous early in the evening.

25, 11½ P.M. Day clear, rather cold; evening clear; no aurora seen, Mr. Wendell reports some aurora evening of Jan. 23. Zodiacal light conspicuous as usual early in the evening. Observations on region of ecliptic in Leo mentioned first before this record; previous observations confirmed; also it is pretty certain that a faint band apparently galactic, extends from σ Leonis to β Virginis. The sky is comparatively dark on both sides, in Leo and also in Sextans. This band lies mainly south of the ecliptic, as now appears from Dien's Atlas; no atlas used in observing it. Its limits are about at σ and φ Leonis; σ Leonis is near its central line. Altitude of ecliptic beyond β Virginis not sufficient for observations. According to present appearances, there is a band from Praesepe across the ecliptic to σ Leonis, where it forks, one branch going towards α Hydrae, as described

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ps 55, and another wider one towards β Virginis, tending to cross the ecliptic again.

25, 11½ P.M. A fresh observation confirms the appearance just described.

26, 9 P.M. While going home last night, concluded that another stream of stars ran from that above described in Leo towards Hydra, approximately parallel with that from σ Leonis to α Hydrae. There is some indication of this in Dien's Atlas (northward from μ Hydrae, Plate 23). Day mostly clear, rather cold; evening clear at times, with clouds often; zodiacal light visible about 7 P.M.; no aurora seen.

27, 11½ P.M. Band of light from σ Leonis towards β Virginis as on Jan. 25; σ and q Leonis on its northern and southern edges; σ Leonis about one third of the way from its northern to its southern edge. Band from this on southwards towards λ and μ Hydrae also confirmed. Other bands in Hydra and from Praesepe to σ Leonis as before. Day clear, cold; evening clear; zodiacal light seen; no aurora seen.

28, 11½ P.M. Bands of light as yesterday; band from Pleiades well seen also. Very slight suspicion of a little light of a different character between Praesepe and α Leonis. Day clear, cold, windy; No. 4 now 4.1; zodiacal light seen early in the evening; no aurora seen.

30, 9½ A.M. Yesterday clear, cold, growing cloudy during the evening. Zodiacal light [illegible]

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January, 1881.

aurora seen. Snow beginning about 9 P.M. today.

31, 9½ A.M. Yesterday rather cold, cloudy, with a little snow; a few stars visible at times in the evening. New Snow about $1\frac{3}{4}$ inches, pretty uniform; $20\frac{1}{2}$ inches in cylinder $1\frac{7}{8}$ inches in diameter weigh 2 ounces.

log 2 0.3010
m. co. log 20.5 8.6882 } 8.7869; 0.0612 inches rainfall to 1 inch of snow.
9.1977
log $1\frac{3}{4}$ 0.2430 9.0299; total rainfall 0.107 inches.

31, 9 P.M. Day rather clear and cold, with some clouds; evening hazy, haze increasing; distinct aurora 7 P.M. and later; double arch after 7½ P.M.; lower arch narrow and bright, over dark sky or clouds; upper arch wider and fainter; bright arch crossed by streaks of cloud; aurora now much fainter among increasing clouds.

Report to Signal Service, sent Feb. 1, 1881.

Aurora — looked for every clear evening; some aurora seen Jan. 23; aurora occasionally suspected Jan. 24; distinct aurora Jan. 31, 7 P.M. and later; double arch after 7½ P.M.; lower arch narrow and bright, over dark sky or clouds; upper arch wider and fainter; bright arch crossed by streaks of cloud; aurora much fainter among increasing clouds at 9 P.M.

Zodiacal light — looked for every clear evening; seen Jan. 1, 17, 18, 20, 24, 25, 26, 27, 28, 29; observations on other evenings hindered by moonlight or clouds.

Lunar halos — Jan. 10, 9¾ P.M., distinct lunar halo; fragmentary lunar halos on the evenings of Jan. 15 and 16.

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February 1881.

Date	Temp. 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	9¼	30.078	Out of sight est. 15.0	6.5	4.3 6.0	18.8 8.0	0		1 N	10 R	1
2	9½	29.895	Out of sight est. 10.0	−3.9	−6.2 −4.7	13.9 −2.0	0		2 NW	0	2
3	9¼	29.820	Out of sight est. 10.0	2.6	−7.1 2.0	5.0 4.0	0		2 NW	0 R Rs 7m	3
4	9½	29.944	Out of sight est. 15.0	13.9	2.0 13.1	16.8 14.7	0		2 NW	0 Rs	4
5	9¼	30.174	20.0	19.5	11.0 18.6	22.0 20.0	0		1 NW	0 P	5
6	9	30.558	23.7	20.4	16.0 19.4	28.0 21.0	0		2 NW	0	6
7	9¼	30.712	22.3	16.7	12.0 15.6	31.2 17.2	0		1 NW	0	7
8	9¼	30.532	26.2	20.1	15.4 19.6	32.5 21.0	0		1 SW	3 Rm Rs 7m	8
9	9½	30.338	32.1	35.8	19.5 35.1	39.7 35.5	0		0 calm	10 P, 5m fog	9
10	9½	30.064	37.2	43.2	34.9 42.2	47.6 42.0	0		0 calm	10 P; much fog	10
11	9½	29.998	39.8	40.8	36.7 40.0	48.6 40.3	1¼	0.110	2 SW	0	11
12	9	29.937	38.1	36.4	30.9 35.7	46.4 36.9	0		2 E	10 P 7m →	12
13	9	29.219	38.0	34.7	34.1 34.1	39.2 33.4	16; see p. 62	1.412	3 SW	10 P	13
14	9¼	29.922	25.6	18.9	17.0 18.1	34.0 19.5	0		2 NW	8 P R Rs 7m ↘	14
15	9¼	30.458	22.8	18.0	11.1 17.2	25.0 18.8	0		2 SW	3 R Rm Rs	15
16	9¼	30.028	31.0	26.8	17.0 26.0	31.2 27.1	see p. 63	0.429	1 N	10 P, snowing	16
17	9¼	30.205	27.8	25.6	21.5 24.8	34.6 26.0	0		1 W	0 P 7m	17
18	~~9½~~	~~29.648~~	~~34.8~~	~~35.2~~	~~14.5~~						18
19	9½	29.648	34.8	35.2	14.5 34.5	35.8 35.0	9⅛ see p. 83	0.805	2 N	10 P, raining	19
20	9	30.344	26.1	20.9	16.5 20.0	36.6 22.0		0.011	2 N	0 7m	20
21	9¼	30.015	33.5	33.4	20.0 32.9	33.1 33.2			2 E	10 P, snowing	21
22	9½	30.058	29.0	26.3	21.4 25.5	33.5 27.0	see p. 64	0.701	1 W	0	22
23	9½	29.644	33.6	37.1	25.3 36.1	36.7 36.7	0		2 S	10 P	23
24	9¼	29.979	out of sight est. 15.0	1.3	0.0 0.7	42.3 3.8	0⅛	0.011	3 NW	0	24
25	9¾	30.018	20.0	9.1	0.7 9.0	10.4 11.0	see p. 65	0.099	1 N	10 P; snowing	25
26	9½	30.350	19.3	11.1	3.0 10.2	17.6 12.4	0		2 W	0	26
27	9¼	29.988	27.0	36.2	10.2 35.3	35.2 34.7	0		2 S	10 P	27
28	9¼	29.512	35.8	45.7	35.0 44.7	46.0 44.0	7⅛	0.629	1 SE	10 P fog; raining	28
		811.458	708.9	632.3	416.7 611.7	841.7	Max. set inside building	see pp. 62-65	4.207	43	134
	9.3	30.054 +.006 30.060	26.3	23.4	15.4 22.7	31.2			Rainfall for month 4.21 inches.	1.6	5.0

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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											Obsc.
2	9 3/4	29.880	Out of sight ext. 10.4	−5.5	2 NW	0	9 3/4	Moon setting	9 3/4	Aurora; see p. 62	Aurora
3											Obsc.
4	9 3/4	30.050	20.5	12.4	2 NW	0	9 3/4	Moonlight	9 3/4	Moonlight	None
5	9	30.276	26.0	21.3	1 NW	7 7m 1	9	Cloudy	9	Cloudy	None
6	8 1/2	30.638	28.7	23.6	1 N	0	8 1/2	Moonlight	8 1/2	Moonlight	None
7	9	30.612	30.2	22.9	ocalm	2 Rs haze	9	Moonlight	9	Moonlight	None
8											Obsc.
9											Obsc.
10											Obsc.
11	8 1/2	30.120	44.0	38.8	1 SW	9 P	8 1/2	Cloudy	8 1/2	Cloudy	None
12											Obsc.
13	8 1/2	29.526	32.9	29.1	4 SW	2 Pne	8 1/2	Moonlight	8 1/2	Cloudy	None
14	9 3/4	30.273	27.0	18.5	1 SW	0	9 3/4	Moonlight	9 3/4	Moonlight	None
15	8 1/4	30.445	32.0	26.0	1 S	4 Pr 7m →	7	Perceptible among clouds	8 1/4	Cloudy	None
16	8 3/4	29.888	34.7	31.3	2 SW	3 haze	8 1/2	Perceptible; haze	8 1/2	None	None
17	9 1/2	30.326	31.3	23.2	1 W	0	7	Visible; not bright	9 1/2	None	None
18											None
19	9	30.069	33.7	26.9	2 NW	0	7	Distinct	9	None	Aurora
20											Obsc.
21											Obsc.
22	9	29.943	34.3	27.9	2 SW	1 Rs haze	7	Distinct	9	None	None
23	9	29.738	34.3	20.9	4 NW	0	7 1/2	Distinct	9	None	None
24	9	30.110	Out of sight ext. 16.0	4.7	1 NW	0	7 1/2	Distinct	9	None	None
25	9 1/4	30.153	24.0	12.0	1 NW	0	7 1/4	Distinct	9 1/4	None	None
26	8 3/4	30.216	26.8	20.8	1 SW	9 P	7 1/4	Cloudy	8 3/4	Cloudy	None
27											Obsc.
28											Obsc.

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February 1881.

2, 9½ A.M. Yesterday cloudy, cold; evening cloudy.
2, 10 P.M. Day clear, cold, with moderate wind; evening clear; thermometer No. 4 at 6½ P.M. 1.0, at 7½ P.M. −2.0, at 8¼ P.M. −4.0. At 9¾ P.M. bright patch of light, apparently auroral, about 5° long by 1° wide, horizontal, beginning about 1° to the right of α Andromedae, on the same level; quickly faded; gone about 9⅝ P.M.; no aurora now. Sky not very clear; bands in Leo and Hydra indistinct, about as in January; Gegenschein not seen; if any, not beyond α Leonis.
4, 9½ A.M. Yesterday clear, rather cold; became cloudy about sunset; evening cloudy.
4, 10½ P.M. Day clear, rather cold; evening clear; no aurora seen; clouds came up rapidly after 9¾ P.M. from the north and east.
6, 9 A.M. Yesterday cloudy at first, clear after 8 A.M.; evening clear at first, with increasing clouds; no aurora seen.
7, 9½ A.M. Yesterday clear, rather cold; evening clear; no aurora seen.
7, 10¾ P.M. Day clear, cool; evening rather clear with some thin clouds; no aurora seen; faint lunar halo for a short time at 9 P.M. & later; thicker clouds came on from the northwest at 10½ P.M.
9, 9½ A.M. Yesterday cloudy, thawing; evening cloudy.
10, 9½ A.M. Yesterday cloudy, thawing; evening cloudy.
11, 9½ A.M. Yesterday cloudy, thawing; with a little rain day and evening.
11, 8½ P.M. Day clear, mild; clouds increasing after 6 P.M.; lunar halo 7 P.M. and later; measured with diopter about 7¼ P.M.; 23½, 23⅔; too indefinite for measurement at all accurately; no aurora seen. Results from diopter 42°.2, 43°.6, for inside diameter of halo.
12, 9 A.M. Somewhat clearer at 11 P.M. yesterday; cloudy again this morning.
12, 5¾ P.M. Gauge 12 ounces.
13, 9 A.M. Gauge 4 " ; in all 16 ounces; rainfall 1.412 inches. Yesterday foggy, rainy; day and evening.
14, 9½ A.M. Yesterday cloudy at first, [illegible]

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clear, with many passing clouds; no aurora seen.

14, 10½ P.M. Day mostly clear, rather cold; evening clear; no aurora seen.

15, 1 P.M. Yesterday variable; rather clear and cold; evening somewhat cloudy; no aurora seen; clouds increased after 8 P.M.; snow early today, ending about noon. New snow now 2¾, 2⅞, 3, 2¾, 3; mean 2.875 inches deep; 20½ inches in cylinder 1⅞ inches across weigh 4⅞ ounces; log 4⅞ 0.6880 log 28.5 8.6882 9.7977 9.1739 log 2.875 10.4587; hence rainfall to 1 inch of snow 0.1492 inches; total rainfall 0.429 inches; gauge cleared out at 9 A.M. and at 1 P.M.; in the interval it had collected 1¼ ounces; 0.110 inches; making rainfall before 9 A.M. 0.319 inches.

16, 10¾ P.M. Afternoon becoming clear, cloudy again early in the evening; growing clear again after 7 P.M.; hazy later, but haze diminishing; no aurora seen.

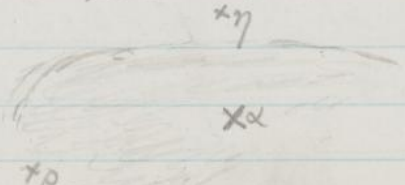
18, 2¾ P.M. Barom. 30.340; attached therm. 30.6; No. 4, 16.5. Yesterday clear, cool; evening and night clear; no aurora seen.

19, 9½ A.M. Yesterday cloudy with a few snowflakes and in the evening rain.

19, 5 P.M. Day cloudy with rain, and afterwards a few snowflakes, clearing off with fresh north wind about 1 P.M.; gauge now 0⅝ ounces; 0.011 inches.

19, 11 P.M. Evening clear; faint low auroral arch at present suspected.

19, 11½ P.M. Region of Lacs examined during last half hour; bands seen as last month; quadrilateral inclosing dark space in neck of Hydra well marked; Gegenschein very doubtful, but slightly suspected; if any, somewhat thus:



Southern and preceding portions confounded with the regular bands of the region.

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February, 1881.

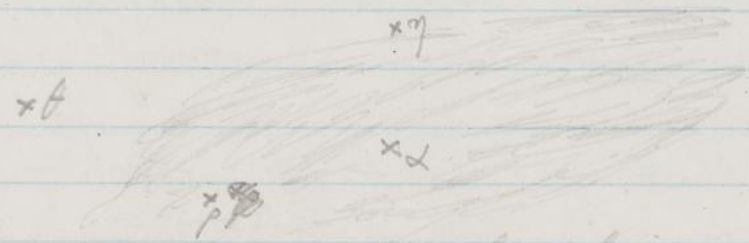
21, 9¼ A.M. Yesterday clear, cool; becoming cloudy towards night; evening clear.

22, 9½ A.M. Yesterday cloudy, with snow; evening cloudy. Snow this morning 3, 3, 4, 4, 4½, 4, 4½, 4½, 4½, 3; mean 3.9 inches; 20½ inches in cylinder 1⅞ inches across weigh 5 7/8 ounces; 0.1798 inches rain fall to 1 inch snow; total rainfall 0.701 inches. Gauge 6 3/4 ounces; 0.596 inches; direct measurement preferred.

22, 10½ P.M. Day clear, cool, growing cloudy by degrees after 6 P.M.; now cloudy in most places; no aurora seen.

23, 10¾ P.M. β Urs. Min. 2 α Urs. Min.; δ Urs. Maj. 1 α Urs. Min.; α α Urs. Min. 2 γ Cass.

Day cloudy with a little rain about 1½ P.M., followed by a little snow; clearing off about 5 P.M.; evening clear; no aurora seen. Gegenschein suspected; certainly not distinct;



but sky seems as bright between α and γ Leonis as south of α, which was not the case last month. Mr. Wendell confirms this independently; supposing Gegenschein to be present, he considers the boundary to include γ Leonis, but to lie on the following side, about half way from α to θ Leonis, and to include β Leonis.

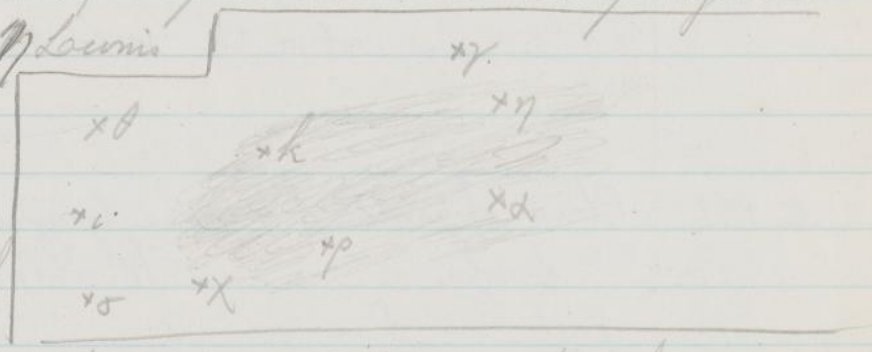
23, 11 P.M. The bands of light seen last month remain as before; it is not practicable to trace anything with certainty beyond β Virginis; at the altitude of γ Virginis the whole sky becomes uniformly pale.

24, 11 P.M. Day clear, cold, wind [illegible] at 2.5;

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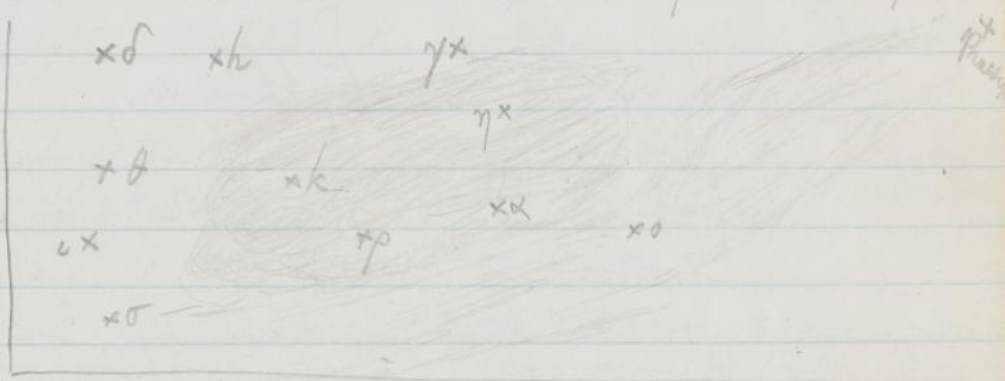
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sky rather hazy, especially in the west; no aurora seen. Gegenschein very slightly suspected earlier in the evening, and now; southern part not distinguishable from the usual band to β Virginis; sky almost certainly lighter between α and η Leonis than between θ and ι Leonis; this was not noticed last months; usual bands seen this evening; sky not clear enough to trace anything beyond β Virginis.



25, 5 P.M. Haze increased after 11 P.M. yesterday; snow this morning, clearing off towards noon; gauge snow 1⅛ ounces, 0.099 inches.

25, 9½ P.M. Gegenschein strongly suspected; seems rather brighter than band from σ Leonis to β Virginis; preceding end thought to be seen, with dark channel between it and the band from Præsepe to σ Leonis: about thus, but still too faint for accurate description.



25, 10¾ P.M. Above sketch confirmed, except that the dark space should be nearer α & η Leonis. Mr. Wendell confirms the observation independently, and makes a sketch (see p. 67).

27, 9¼ A.M. Yesterday clear, cool; becoming cloudy after 6½ P.M.; rather cloudy 8 to 9 P.M.; rather clear at 10½ P.M.; no aurora seen; Gegenschein suspected, although there was perhaps too much haze for a trustworthy observation; it seemed to extend from α to σ Leonis; the sky immediately

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February, 1881.

preceding α and η Leonis looked relatively dark.

28, 9½ P.M. Yesterday rather cloudy, mild; clouds thickening in the evening.

March 1, 9½ A.M. Yesterday cloudy, foggy; some rain; thunder and lightning about 10 P.M.

Date 1881.	Place of middle of supposed Gegenschein. S. obs. α	δ	W. obs. α	δ		Place of Sun. α	δ
	h m	°	h m	°	°	h m	°
Feb. 19	10 4	+14			154	22 15	−11
23	10 0	+14	[10 0	+14]	158	22 30	−9
24	10 16	+14			158	22 34	−9
25	10 20	+16	10 28	+17	159	22 38	−8.6
March 24	12 28	±0	12 28	+1	184	0 17	+2
28	12 40	−2	12 36	−1	188	0 31	+3½
April 4	13 0	−3	[13 0	−3]	194	0 57	+6

See p. 76 for correction of April 4.

Places estimated from sketches in this record by the aid of Dien's Atlas, (epoch 1860), and may be too small by about 1m.

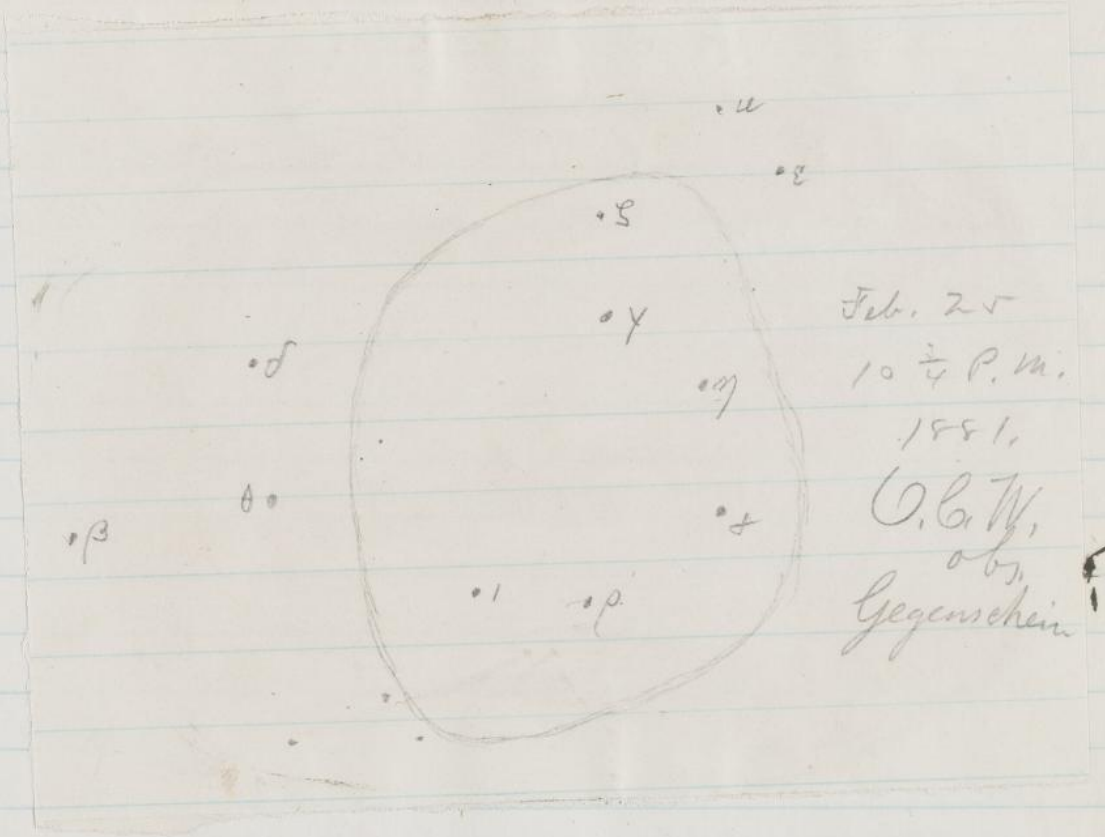
The sketch of Feb. 27, 1878, books P 15 and Q 5, makes the middle of the Gegenschein

10h 40m +13° Place of Sun 22h 44m −8°

These results pretty closely resemble Bronsen's and Schmidt's in No. 1726 of the Astronomische Nachrichten (Vol. 72, 337–342).

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Report to Signal Service, sent March 1, 1881.

Aurora looked for every clear evening; Feb. 2, 9¾ P.M., bright patch of light, apparently auroral, about 5° long, 1° wide, horizontal, beginning about 1° to the right of α Andromedae on the same level; quickly faded; gone about 9⅝ P.M.; no aurora visible at 10 P.M; Feb. 19, 11 P.M., faint low auroral arch suspected.

Zodiacal light looked for every clear evening; visible Feb. 15, 16, 17, 19, 22, 23, 24, 25; observations on other evenings hindered by moonlight or clouds.

Lunar halos. Feb. 7, 9 P.M. and later; faint lunar halo for a short time; Feb. 11, 7 P.M. and later, lunar halo.

Thunder and lightning Feb. 28, about 10 P.M.

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March 1881.

Date	Sigma 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	9½	29.117	37.8	37.6	35.0 36.8	49.7 37.4	1¼	0.110	1 N	10 P; some fog	1
2	9	29.460	35.0	31.3	30.5 30.8	39.0 31.4			2 N	10 P. snowing	2
3	9¼	29.884	35.6	35.7	29.9 35.1	36.3 35.5	sup. 70	0.265	3 N	10 P 7m ⊥	3
4	9	29.678	36.2	34.9	32.9 34.3	36.2 35.0	3⅜	0.298	3 NE	10 P.; fine rain	4
5	9	29.420	35.0	32.6	30.5 32.0	38.2 32.8	10⅜	0.916	3 SW	9 P 7m ⊥	5
6	9	29.498	34.3	31.8	27.7 31.1	38.2 31.9	0		2 N	10 R	6
7	9	29.830	34.3	34.9	28.6 34.2	39.2 34.8	0		2 NW	0	7
8	9¼	30.038	36.2	36.1	29.3 35.2	45.9 35.9	0		1 NW	0	8
9	9	29.951	38.4	37.9	31.6 37.1	47.4 38.0	0		2 E	10 P 7m	9
10	9¼	29.512	40.0	39.4	36.3 38.8	41.0 39.0	37⅞	3.343	3 NE	10 P.; fine rain	10
11	9¼	29.318	37.1	31.4	30.8 30.8	40.0 31.0	5⅛	0.452	3 NW	10 P.; a little snow	11
12	9	29.718	33.4	31.7	26.1 30.9	33.7 31.7	0⅛	0.011	2 NW	7 R	12
13	9	29.688	37.5	35.0	30.8 34.2	42.0 35.2	2⅛	0.188	2 N	10 R; a little snow	13
14							sup. 70	0.044			14
15	9½	30.285	34.7	34.6	28.0 34.0	39.3 34.6	0¼	0.022	1 NE	1 M 7m	15
16	9½	29.968	36.3	35.7	28.9 35.1	41.0 35.9	0		2 SW	10 P 7m →	16
17	9¼	30.136	39.0	36.3	33.2 35.9	49.8 36.4	0		2 NE	10 P	17
18	9	30.137	38.1	36.9	33.2 36.4	37.2 37.0	0		2 E	10 P 7m	18
19	9½	30.134	39.7	38.4	34.6 37.9	41.0 38.6	0		2 E	10 P M 7m →	19
20	9	29.614	39.0	35.7	33.0 35.1	41.0 35.9	12¼	0.806	3 E	10 P. fine rain	20
21	9¼	29.443	40.0	41.7	34.2 41.1	41.2 41.2	1½	0.132	2 W	3 M 7m →	21
22	9¼	29.403	38.0	38.8	31.0 38.0	48.0 38.6	0		2 W	1 Rs 7m	22
23	9½	29.330	37.2	34.7	29.3 34.2	46.0 35.0	0		2 NW	10 Pm	23
24	9¼	29.373	35.4	35.4	27.3 34.8	39.8 35.5	0		3 NW	1 R M 7m	24
25	9½	29.557	35.9	36.0	28.2 35.3	40.9 36.0	0		3 NW	0 7m	25
26	9½	29.510	35.9	32.8	26.7 32.3	42.0 33.0	0		2 NW	10 Pm 7m	26
27	9	29.260	32.0	25.9	24.3 25.1	35.3 26.2	0		3 NW	10 P.; a few snow flakes	27
28	9¼	29.361	34.1	33.8	25.0 33.3	35.3 34.0	0		3 NW	5 Pm 7m →	28
29	9½	29.700	35.2	35.8	28.2 35.1	42.6 35.9	0		2 W	8 P Rs 7m →	29
30	9¼	29.603	39.7	37.1	33.2 36.5	46.3 37.0	0		3 NE	10 R 7m	30
31	9½	28.902	37.4	35.3	32.2 34.8	38.0 35.4	10½	0.894	2 N	10 P. a little rain	31
	9.2	888.832 29.628 29.027	1098.4 36.6	1055.2 35.2	910.5 30.4	1036.2 34.5	1231.5 41.0	Max. set inside building	See p. 70	7.481 Rainfall for month of 31 days	68 2.3	225 7.5	

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March 1881

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											Obsc.
3											Obsc.
4											Obsc.
5	8¼	29.449	38.7	32.1	1 N	10 P, rather thin	7	Moonlight	8¼	Cloudy	None
6											Obsc.
7	8¾	29.936	41.2	38.7	2 W	0	8¾	Moonlight	8¾	Moonlight	None
8	8¾	30.010	44.0	38.2	1 S E	5 P 7m	8¾	Moonlight & clouds	8¾	Moonlight & clouds	None
9											Obsc.
10											Obsc.
11											Obsc.
12											Obsc.
13	~~8½~~	30.078	37.9	33.1	0 calm	0 haze	8½	Moonlt.			Obsc.
14	8½	30.078	37.9	33.1	0 calm	0 haze	8½	Moonlight	8½	Moonlight	None
15	8½	30.214	38.8	33.8	2 E	2 Pc 7m	8½	Moonlight & clouds	8½	Moonlight & clouds.	None
16	8¾	30.002	43.5	39.7	2 NW	0 P	8¾	Moonlight	8¾	Moonlight & clouds.	None
17											Obsc.
18	8½	30.153	41.7	36.2	1 E	5 P 7m	8½	Cloudy	8½	Cloudy	None
19											Obsc.
20											Obsc.
21	8¼	29.497	44.0	38.7	1 W	1 Rs haze	8¼	Distinct	8¼	None	None
22	8½	29.377	41.9	37.1	1 W	10 P 7m	8½	Cloudy	8½	Cloudy.	None
23											Obsc.
24	8½	29.462	39.6	36.2	2 W	8 Pm 7m →	8½	Cloudy	8½	Cloudy	None
25	8½	29.600	38.2	33.7	2 NW	0	8½	Distinct	8½	None	None
26	8¼	29.301	34.2	29.2	2 NW	0	8¼	Distinct	8¼	None	None
27											Obsc.
28	9¼	29.574	37.8	34.1	2 NW	0	9	Distinct	9	None	None
29											Obsc.
30											Obsc.
31											Obsc.

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March, 1881.

2, 9 A.M. Yesterday cloudy, foggy with a little fine rain; snow now about $0\frac{1}{2}$ inches.

2, 6 P.M. Day cloudy with melting snow and rain; gauge now $2\frac{1}{16}$ ounces; 0.199 inches; snowing at present.

3, $9\frac{1}{2}$ A.M. Yesterday evening cloudy with a little rain. Gauge now $0\frac{3}{16}$ ounces; 0.066 inches; total rainfall 0.265 inches.

4, 9 A.M. Yesterday cloudy day and evening with a little snow and rain.

5, 9 A.M. Yesterday cloudy day and evening with some rain.

6, 9 A.M. Yesterday mostly cloudy, somewhat clear about sunset and till $9\frac{1}{16}$ P.M.; thin clouds later; no aurora seen.

7, 9 A.M. Yesterday cloudy and cool, day and evening.

8, $9\frac{1}{2}$ A.M. Yesterday clear and cool, day and evening; no aurora seen.

8, $8\frac{3}{4}$ P.M. Day rather clear and warm; evening partly cloudy; lunar halo, irregular, 7 P.M. and at times later; β Geminorum about as much inside of inner edge (perhaps $0^{\circ}1$) as β Aurigae was outside of inner edge; α Tauri about half way from inner to outer edge.

9, 9 A.M. Yesterday evening partly cloudy; no aurora seen.

10, $9\frac{1}{2}$ A.M. Yesterday cloudy and rainy day and evening; clouds peculiar about 6 P.M., bulging out downwards, with strong contrasts of color.

11, $9\frac{1}{2}$ A.M. Yesterday cloudy with some rain, day and evening.

12, 9 A.M. Yesterday cloudy and windy day and evening, with a little snow.

13, 9 A.M. Yesterday cloudy day and evening; snow late in the night.

14, $10\frac{1}{2}$ P.M. Yesterday cloudy with some snow and rain; evening cloudy; meteorological record accidentally omitted this morning. The gauge at 9 A.M. showed $0\frac{1}{2}$ ounces. Today cloudy with some snow in the forenoon; clearing off after 5 P.M.; mostly clear 6 to $9\frac{1}{2}$ P.M. with some passing clouds; no aurora seen; clouds increased later.

15, $10\frac{3}{4}$ P.M. Day mostly rather clear, cool; evening rather clear, with passing clouds; no aurora seen.

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16, 11 11/12 P.M. Day cool, rather cloudy; evening mostly clear after 7 P.M., with frequent clouds; no aurora seen; cloudy now.

18, 9 A.M. Yesterday cloudy, cool, with a few snowflakes towards night.

19, 9 1/4 A.M. Yesterday cloudy, cool; partly clear for a time between 8 and 9 P.M.; no auroa seen.

20, 9 A.M. Yesterday mostly cloudy, cool, with snow and rain in the evening.

20, 5 3/4 P.M. Barom. 29.409; attached therm. 40.1; No. 4, 39.2.

21, 9 1/4 A.M. Yesterday cloudy, chilly, with some fine rain and mist.

22, 9 1/4 A.M. Yesterday partly clear, with many passing clouds; evening rather clear, with increasing haze and thin clouds; no aurora seen. Region of Leo inspected about 8 1/4 P.M.; apparently same appearances as in January, not as in last half of February; but sky somewhat hazy.

23, 9 1/4 A.M. Yesterday mostly cloudy, cool; evening somewhat clear till 7 P.M., afterwards growing cloudy; no aurora seen.

24, 9 1/4 A.M. Yesterday mostly cloudy, cool; evening cloudy, with a few snowflakes.

25, 9 1/2 A.M. Yesterday rather cloudy cool; evening at first rather cloudy nearly clear after 9 P.M.; no aurora certainly seen; slightly suspected among clouds between 9 and 10 P.M.; zodiacal light somewhat visible among clouds at times; Gegenschein looked for between 10 P.M. and midnight by E.C.P., C.C.W., and A.S. independently: P's observation; some light thought to be seen, centre about 12h 20m right ascension, on the equator; thought not to extend as far as β Virginis westwards; observation of A.S. as in sketch; boundary eastward and northward doubtful. Loco

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March, 1881.

January; region between α and β Leonis darker than that from σ Leonis to β Virginis; band of light from Coma Berenices to supposed Gegenschein; Spica in a rather dark part of the sky; a band from the neighborhood of ν Virginis to β Libræ or a little north of it; W.'s observation; no appearance of light in Leo as seen in February; supposed Gegenschein as in sketch pasted below.



"Gegenschein" Mar. 24. 1881.

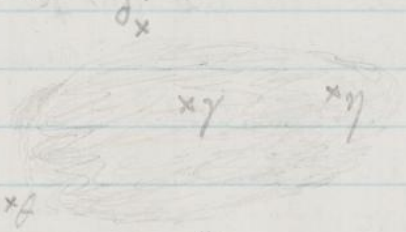
O. C. W. obs.

25, 11⅔ P.M. Day fair, cool; evening clear; no aurora seen; Gegenschein noticed about 10 P.M. and now, about as yesterday, but after the beginning of the twilight [illegible]

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β to η Virginis, and extending to θ Virginis, but not beyond.
26, 10½ P.M. Day cloudy at first, soon clear; evening mostly clear, now growing cloudy; no aurora seen; Gegenschein only slightly suspected; not suspected beyond θ Virginis to the east.
28, 9¼ A.M. Yesterday mostly cloudy, cool, windy; evening mostly cloudy,
28, 11 P.M. Day and evening clear, cool, rather windy; no aurora seen; Gegenschein, if seen, as below, in Virgo; band of light from Coma Berenices



apparently interferes with the observation.

29, 9½ A.M. Mr. Wendell reports centre of Gegenschein last night at about γ Virginis.
30, 9¼ A.M. Yesterday rather clear, cool; evening cloudy,
31, 9½ A.M. Yesterday cloudy day and evening, with rain sleet, and snow.
31, 12 M. Barom. 28.931; attached therm. 38.0; No. 4, 37.0
31, 5¾ P.M. Barom. 29.052; attached therm. 38.0; No. 4, 33.1; snowing, wind NE, strong.
April 1, 9¼ A.M. Yesterday evening cloudy.

Report to Signal Service, sent April 1, 1881.

Aurora looked for every clear evening; slightly suspected among clouds March 24, between 9 and 10 P.M.

Zodiacal light looked for every clear evening; distinct March 21, 25, 26, 28; somewhat visible among clouds March 24; observations on other evenings hindered by moonlight or clouds.

Lunar halo, irregular, March 8, 7 P.M., and at times later.

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April 1881.

Date	Time	Barometer	Attached Thermometer	No. 4	Minimum, before and after setting		Maximum, before and after setting		Gauge	Rainfall in inches.	Wind.	Clouds
1	9¼	29.311	37.0	37.2	30.1	36.7	37.0	37.0	0¼	0.022	1 NW	9 Rm 7m
2	9	29.429	38.4	35.0	33.6	34.5	46.3	35.3	0		3 NW	3 R Rm 7m
3	9	29.637	30.8	28.9	24.3	28.0	40.5	29.0	0		3 NW	6 R Rs
4	10	29.476	31.4	31.6	22.2	30.8	36.0	31.7	0		2 W	4 R Rs
5	9¼	29.266	26.8	23.8	19.6	23.2	38.6	24.7	0		3 NW	0
6	9½	29.413	30.9	23.0	19.8	22.7	29.8	24.2	0		2 N	9 PM 7m →
7	9¼	29.638	30.9	35.7	20.3	35.0	35.3	35.3	0		2 NW	5 R 7m ↘
8	9¼	29.806	38.8	43.0	30.3	42.0	47.8	42.5	0		2 NW	0
9	9¼	29.834	38.7	45.8	30.4	44.5	51.5	44.8	0		2 NE	0
10	9¼	29.816	38.8	45.7	29.5	45.0	51.1	45.0	0		2 NE	6 PR 7m
11	9¼	29.834	39.8	47.0	30.1	46.2	50.5	46.6	0		2 NW	6 PR
12	9¼	29.920	42.7	43.1	35.2	42.3	58.4	43.0	0		1 SW	10 P
13	9	29.771	40.2	37.6	33.3	37.0	45.7	37.6	4	0.353	2 E	10 P
14	9¼	29.668	39.4	38.0	33.8	37.3	37.8	38.0	4½	0.397	2 NE	10 P
15	9	29.120	37.0	33.0	31.2	32.6	42.3	33.5	See p. 77	0.656	4 N	10 P; snowing
16	9¼	29.442	40.0	43.0	32.3	42.7	42.6	42.6	0¼	0.011	2 SW	5 P 7m →
17	9	29.658	43.4	46.8	38.0	45.9	54.7	46.3	0		3 NW	0 P
18	9¼	29.790	43.3	45.2	34.8	44.2	53.0	44.7	0		2 NW	2 P Rm Rs 7m
19	9½	30.000	40.9	41.7	33.2	40.5	52.2	41.3	0		2 N	0
20	9¼	30.123	43.2	45.3	35.2	44.5	52.0	44.9	0		2 E	9 P 7m
21	9½	29.969	45.1	53.8	33.3	52.5	54.2	53.0	0		2 NW	6
22	9½	30.120	45.1	41.8	36.8	41.0	61.2	41.8	0		0 calm	10 P; a little rain
23	9¼	30.150	45.0	48.8	36.9	47.9	48.8	48.2	0¾	0.066	2 NE	0
24	10	29.969	50.0	62.7	42.2	62.1	62.1	61.0	0		3 SW	9 P 7m
25	9¼	30.024	57.6	54.6	52.1	53.8	77.4	54.6	0		2 SE	0 7m haze
26	9½	29.872	51.9	53.9	41.9	53.1	57.2	53.8	0		2 S	10 P
27	9½	29.928	55.6	52.2	50.1	51.8	67.7	52.4	0⅛	0.011	2 E	10 P
28	9½	29.874	54.1	59.1	43.2	58.2	58.7	58.3	0⅛	0.011	2 SW	0
29	9½	29.868	54.5	48.3	46.0	47.2	69.0	48.5	2¼	0.199	0 calm	10 P; raining
30	9½	30.136	49.3	48.5	37.8	47.5	60.2	48.0	0⅛	0.011	2 NW	0 M 7m
	9.3	892.882 / 29.763 / −.036 / 29.727	1260.8 / 42.0	1294.1 / 43.1	1017.5 / 33.9	1270.2 / 42.3	1519.6 / 50.7	Max. set inside building	See p. 77	1.737 Rainfall for month 1.74 inches	61 / 2.0	150 / 5.0

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April 1881.

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	9 1/4	29.641	35.9	31.1	1 W	5 P 7m	8	Moonlight	8	Moonlight	None
3	8 1/4	29.550	35.0	31.2	2 W	0	8 1/4	Moonlight	8 1/4	Moonlight	None
4	9 3/4	29.314	35.1	28.6	1 W	0 Rs	9 3/4	Moonlight	9 3/4	Moonlight	None
5											Obsc.
6	10 1/4	29.552	31.0	22.0	2 NW	0	8	Moonlight	10 1/4	Moonlight	None
7	9	29.780	40.6	36.8	1 NW	0 P	8	Moonlight	9	Moonlight	None
8	9 1/4	29.799	44.9	40.1	1 N	0 P	9 1/4	Moonlight	9 1/4	Moonlight	None
9	9 1/2	29.819	45.0	39.1	0 calm	0 haze	9 1/2	Moonlight	9 1/2	Moonlight	None
10											None
11	9 3/4	29.929	47.8	42.9	2 SW	0	9 3/4	Moonlight	9 3/4	Moonlight	None
12											Obsc.
13											Obsc.
14											Obsc.
15											None
16											None
17	9	29.755	48.4	43.8	1 NW	0 7m haze	8 1/2	Distinct	9	None	None
18	9 1/2	29.852	45.8	40.4	1 SW	0 haze	9 1/2	Perceptible	9 1/2	None	Aurora
19	9 3/4	30.078	47.0	40.9	1 NW	4 P haze	8 1/2	Distinct	9 3/4	Diffused light & streamers	Aurora
20	9 1/2	30.028	46.0	38.9	2 SE	0	8 1/4	Visible	9 1/2	Arch & streamers	Aurora
21	9	30.037	53.0	47.0	2 NE	7 P haze	9	Cloudy	9	Cloudy	None
22	9	30.055	47.6	42.3	1 SE	10 P	9	Cloudy	9	Cloudy	Obsc.
23	9	30.196	51.0	45.2	1 SE	0 P Rs	9	Distinct	9	None	None
24	8 1/2	29.816	67.2	70.4	2 NW	1 P haze	8 1/2	Distinct	8 1/2	None from clouds	None
25	9	30.013	56.4	48.9	1 SE	9 P 7m haze	9	Cloudy	9	Cloudy	None
26											Obsc.
27											Obsc.
28	10 1/2	29.999	60.3	55.3	1 W	3 P m 7m haze	8 1/2	Cloudy	10 1/2	Streamers among clouds	Aurora
29	11 1/4	30.048	54.0	46.1	2 NW	0 haze	8 1/2	Distinct	11 1/4	None	None
30	10 1/2	30.308	51.2	40.1	1 NW	0	8 1/2	Moonlight	10 3/4	None	None

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April 1881.

2, 9 A.M. Yesterday rather clear and warm; evening cloudy.

3, 9 A.M. Yesterday rather clear, cool; evening rather clear, growing rather cloudy after 8½ P.M.; no aurora seen.

4, 12¼ A.M. (3 astronomically) Gegenschein thought to be seen independently by S. and W., about as below: sky almost certainly darker about η Virginis and west of it than when observed last; stream or band of light from Coma Berenices now seen to end before reaching η Virginis, and apparently to join the band from ο Leonis to β Virginis.



{α called 13h 0m on p. 66}

α 12h 56m ± α δ −4°
Sum 0 54 ; +5°.7

4, 12½ A.M. Barom. 29.558; attached therm. 34.8; No. 4, 27.0; yesterday clear, cool; evening mostly clear, with some clouds in the west and north; no aurora seen.

4, 11 P.M. Day clear, cool; evening rather clear with some thin clouds; no aurora seen: clouds now thicker.

5, 1⅔ P.M. Barom. 29.248; attached therm. 31.6; No. 4, 28.0

6, 9½ A.M. Yesterday mostly cloudy, cold; evening cloudy with a few snowflakes.

6, 10¼ P.M. Day rather cloudy, with slight snow squalls; evening clear; no aurora seen.

8, 9¼ A.M. Yesterday rather clear, cold; evening rather clear, with passing clouds; no aurora seen.

8, 11¼ P.M. Day & evening clear, temperate; no aurora seen.

10, 9¼ A.M. Yesterday clear, rather warm, day and evening; no aurora seen.

11, 9¼ A.M. Yesterday rather cloudy and warm; evening rather cloudy at first, rather clear 10 P.M.; no aurora seen.

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

13, 9 A.M. Yesterday cloudy day and evening with a little rain and snow.

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14, 9¼ A.M. Yesterday cloudy and cool day and evening, with a little rain.

15, 9 A.M. Yesterday cloudy and cool, with rain in the evening; snow later in the night and this morning, now about 3 inches deep.

15, 10¼ A.M. Snow ceased between 9 and 10 A.M.; a little rain snow; gauge cleared out. Snow measured in 10 places; depth 4, 3½, 2½, 4½, 3, 3, 3, 3, 3½, 2½; mean 3.25 inches; 21 inches in cylinder 1⅞ inches across weigh 6¾ ounces; {log reduction 9.7977 / log 6.75 0.8293 / arc-co-log 21 8.6774} sum 9.3044; hence rainfall to 1 inch of snow 0.2017 inches; total rainfall 0.656 inches.

16, 9¼ A.M. Yesterday cloudy with snow and a little rain; evening partly clear after 8 P.M.; no aurora seen.

17, 9 A.M. Yesterday rather clear and warm, growing rather cloudy; evening rather cloudy; no aurora seen.

17, 10¾ P.M. Day rather clear, cool; evening rather clear, with some clouds, especially after 10 P.M.; no aurora seen; zodiacal light about 8½ P.M. clearly much brighter than Milky Way at same altitude; vertex of light probably in the Milky Way.

18, 11¼ P.M. Day clear, rather warm; evening clear, somewhat hazy; no aurora seen; region of Virgo examined; there are apparently two bands from Coma Berenices, one as described April 11, nearly reaching γ Virginis, and joining band from α Leonis; the other narrow, to α Virginis; γ Virginis is in a comparatively dark space in the fork of these two bands. Sky uniformly pale below altitude of ζ Serpentis; light between α Virginis and α Librae, joining pale sky below; if this is Gegenschein, its centre is probably between α β λ Virginis and south of the line joining them. The light does not appear north of κ Virginis. The stars of Corvus on one side, and ν and μ Virginis on the other are in spaces comparatively dark. α 13h 40m δ −12° 5. Sun 1h 49m + 11°.3.

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April, 1881.

8, 11½ P.M. Low auroral arch now formed.

9, 10½ P.M. Day clear, rather warm; evening clear at first, with increasing clouds; now rather cloudy. aurora among clouds, still continuing; zodiacal light about 8½ P.M. about the Pleiades probably twice as bright as parts of Milky Way at same altitude; vestige of light not distinguishable in Milky Way. Mr. Wendell says that he noticed yesterday that no light was visible where Gegenschein was last seen.

20, 11 P.M. Day rather cloudy cool; becoming clear afternoon; evening clear; aurora all the evening; arch, sky dark below; some streamers about 9½ P.M.; top of arch gradually sinking so as to keep at about the altitude of α Cassiopeiae. Region of Virgo about as April 18; light between α Virginis and α Librae, sky dark both sides, in Corvus and in Virgo. a band from Arcturus joins that from Coma towards α Virginis; another band from α Virginis towards ε Serpentis; sky uniformly pale at altitude of α Librae.

20, 11½ P.M. Auroral streamers.

21, 9¾ P.M. Mr. Wendell reports Gegenschein probably seen last night, centre preceding ι and κ Virginis by about half their distance apart, and intermediate between them in declination. It was of small extent, including ι and κ but not reaching far beyond them. α 14h.0, δ' −7°.0; Sun 2h.0, +12°.2.)

21, 11 P.M. Day clear, rather warm; evening rather cloudy and hazy, rather more clear now than before; no aurora seen.

22, 11½ P.M. Day and evening mostly cloudy with a little rain early; afternoon somewhat clear at times.

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23, 11½ P.M. Day clear, rather warm; evening clear, now mostly cloudy; no aurora seen.

24, 10½ P.M. Day warm, rather cloudy at first, afterwards rather clear; evening hazy, with some clouds; no aurora seen.

26, 9½ A.M. Yesterday rather clear and warm; evening somewhat clear at first, afterwards cloudy and hazy; no aurora seen.

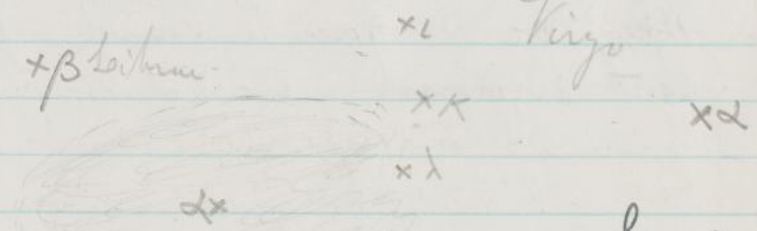
26, 11½ P.M. Day cloudy with a few drops of rain; evening cloudy and hazy, stars sometimes partly visible; no aurora seen.

28, 9½ A.M. Yesterday cloudy and rather cool with a few drops of rain; evening cloudy.

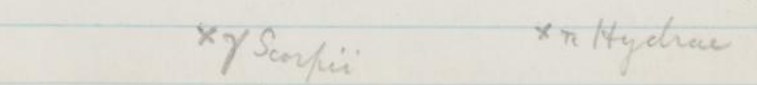
28, 10½ P.M. Day clear, warm; evening rather cloudy; auroral streamers and light visible now among clouds.

29, 11¼ P.M. Day cloudy with a little rain, clear towards night; evening clear with slight haze; no aurora seen; region of Virgo as on April 18; haze hinders observation; but light between α Virginis and α Librae, perhaps reaching its greatest altitude above α Librae; it joins the pale sky below.

30, 11¼ P.M. Day somewhat cloudy and cool, evening clear; no aurora seen; somewhat less haze than usual at this time of year; Gegenschein very slightly suspected as below



See 1. 81.
α 14h 36m, δ − 16°
Sun, April 30.5, α 2h 34m, δ + 15.°1



There seems then a very [illegible]

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April 1881

of a streak of comparatively dark sky between Scorpius and Libra, passing between α Librae and γ Scorpii (Dien's Atlas) same in H.P. and going to Corvus, which looks comparatively dark, as before. There is still some light between α Virginis and α Librae, character uncertain.

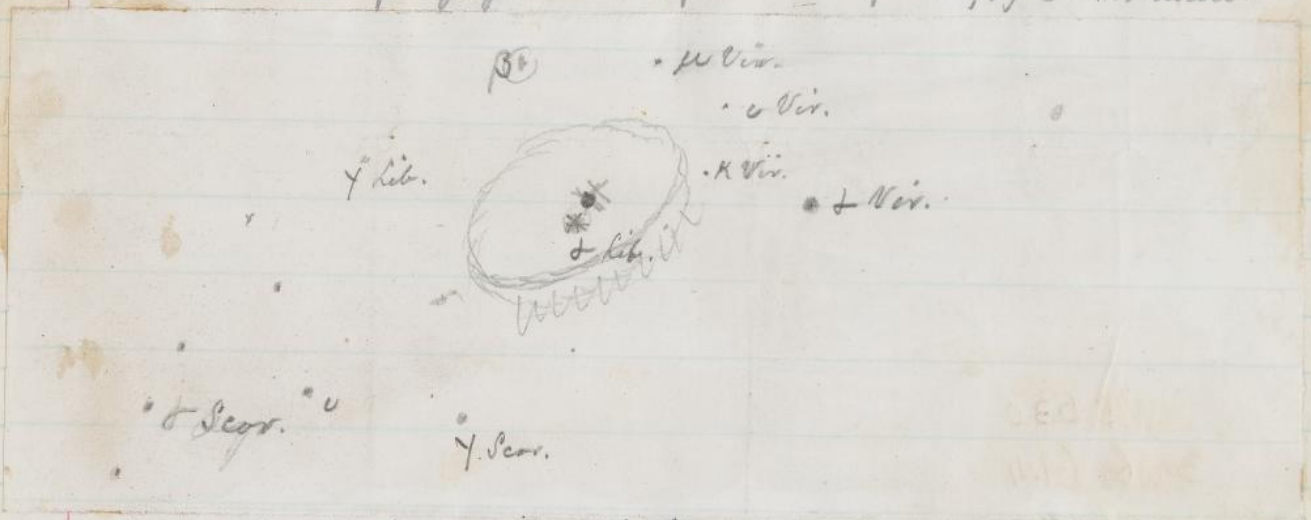
The great dark region of the sky may be bounded roughly as follows; boundary from α Urs. Min. to β Urs. Maj. thence to ε Urs. Maj., thence to ε Bootis, thence to α Serpentis, thence to γ Draconis, thence to α Urs. Min.; within this region the sky is relatively very dark. See Jones, p. 50.

The band from Coma Berenices to the neighborhood of γ and β Virginis thence to ο Leonis, pretty well confirmed; also the other from Coma Berenices towards α Virginis, leaving γ Virginis in a comparatively dark space; the third from the neighborhood of α Bootis, running into the second. There may be a faint band from the neighborhood of ε Virginis towards ε Serpentis.

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Sketch of Gegenschein after 11 P.M. April 30, by O.C. Wendell.



See sketch by A. Searle on p. 79.

α Librae, 1881, April 30, Sun, α 14h 44m δ − 15° 32′.7 {Gegenschein α 14h 40m, δ − 13°.5}
α 2 34 δ + 15 7 .

Report to Signal Service, sent May 2, 1881.

Aurora looked for every clear evening; April 18, 11½ P.M., low auroral arch, not seen earlier; April 19, aurora among clouds 10½ P.M. and earlier; April 20, aurora all the evening; arch, sky dark below; some streamers about 9½ P.M. and 11½ P.M.; top of arch gradually sinking, so as to keep at about the altitude of α (Alpha) Cassiopeiae; April 28, auroral streamers and light among clouds at 10½ P.M.

Zodiacal light looked for every clear evening; distinct April 17, 19, 23, 24, 29; visible also April 18, 20; observations on other evenings hindered by moonlight or clouds.

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May 1881.

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
1	9¼	30.386	46.4	46.9	32.4	46.0	54.6	46.7	0		1 W	0
2	9¼	29.936	51.8	53.7	44.9	52.8	60.2	53.3	1	0.088	1 SW	10 Pm Fm; raining
3	9½	30.300	49.8	44.9	38.4	44.2	63.2	45.3	0		2 N	0 P Rs
4	9½	30.446	47.4	48.5	33.7	47.3	56.3	48.0	0		2 E	0 Rs Fm
5	9½	30.348	47.9	53.8	35.0	53.5	53.9	53.7	0		1 S	0 haze
6	9½	30.067	50.9	47.3	45.0	46.5	63.0	47.5	1¾	0.154	0 calm	10 P fog; raining
7	9¼	30.068	49.2	51.2	42.2	50.1	50.6	50.6	2⅝	0.232	1 NW	10 Pm M Fm
8	9¾	30.027	53.3	64.0	46.8	63.3	63.2	63.0	0		1 NW	10 Pm Fm
9	9¼	30.185	53.0	51.9	44.1	51.2	70.0	52.0	0		1 W	10 Pm
10	9¼	30.060	61.4	69.9	51.1	69.0	75.7	68.1	0		1 SW	1 P Rs Fm haze
11	9¼	30.046	59.0	61.3	49.7	60.4	85.0	60.5	0¾	0.066	1 SW	7 P Fm →
12	9½	30.000	71.0	76.4	60.2	75.3	86.0	75.3	0		2 N	0 Rs M Fm ↓
13	9¼	30.002	61.5	61.9	50.2	61.1	76.0	61.2	0		1 S	10 Pm
14	9	30.046	58.8	60.0	45.4	59.1	71.0	59.2	0		1 N	0 Rs Fm
15	9¼	29.692	60.0	55.9	52.7	54.0	68.2	55.0	4	0.353	2 S	10 Pm Fm
16	9¾	29.741	55.5	47.2	45.8	46.7	65.0	47.7	0¼	0.022	2 NE	10 Pm; a little rain
17	9½	29.828	49.6	43.4	42.7	42.7	47.9	48.1 (see p. 86)	3½	0.309	3 NE	10 Pm; raining
18	9½	30.078	48.6	44.7	41.5	44.0	44.3 (see p. 86)	44.5	5½	0.485	2 NE	10 Pm
19	9½	29.981	49.7	48.1	42.9	47.3	47.8	48.0	6¼	0.552	2 NE	10 Pm; fine rain
20	9¼	29.980	52.4	51.7	46.8	51.0	51.0	51.0	2¼	0.199	0 calm	10 Pm
21	9¼	30.046	53.5	50.3	45.5	49.5	61.6	50.4	0¼	0.022	2 NE	10 Pm
22	9½	30.081	55.0	59.6	47.5	59.0	59.0	58.9	0		1 W	9 Pm Fm →
23	9½	30.208	59.2	62.4	50.3	62.7	68.0	62.8	0		1 E	5 P M Fm
24	9½	30.268	60.3	63.6	52.2	62.9	67.5	63.0	0		1 E	3 fog
25	9	30.166	61.0	68.2	50.0	67.5	70.7	67.0	0		1 SE	3 haze
26	9½	30.266	56.5	52.1	46.0	51.4	69.5	52.3	0		1 NE	10 Pm
27	9½	29.920	63.5	76.8	51.3	76.1	76.0	75.5	0		1 W	3 haze Rs Fm
28	9½	29.978	65.1	63.2	60.2	62.3	86.4	62.9	0		1 NE	10 Pm
29	9¼	29.949	63.0	61.1	57.2	60.1	68.9	60.8	0¼	0.022	1 S	10 Pm
30	9½	29.790	66.9	76.3	60.1	75.1	75.2	74.2	0⅛	0.011	2 SW	1 haze
31	9½	29.866	69.0	71.4	62.9	70.3	86.2	69.2	9	0.794	1 SE	10 Pm Fm
	9.4	931.799 / 30.058	1749.3 / 56.4	1788.1 / 57.7	1474.2 / 47.6	1762.1 / 56.9	2041.9 / 65.9	Mean of monthly readings	37½	3.309 Rainfall for month 3.31	40 / 1.3	200 / 6.5

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May 1881.

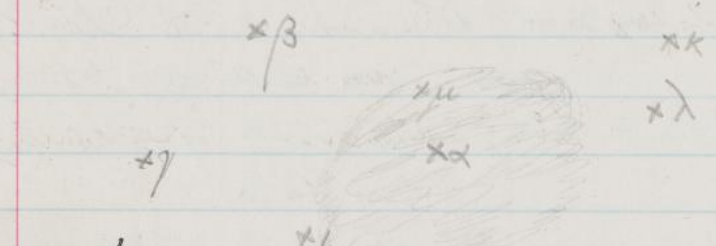
Date	Time P.M.	Barometer	Attached Thermometer	No. 4	Wind	Clouds	Time P.M.	Zodiacal Light	Time P.M.	Aurora	Report to Signal Service
1											Obsc.
2	7 1/3	30.057	56.0	53.0	2 NW	2 P.R. haze	9 1/2	Moonlight	9 1/2	Moonlight	None
3	8 3/4	30.336	51.5	44.0	0 calm	0 P.	8 3/4	Moonlight	8 3/4	Moonlight	None
4	11 1/2	30.376	49.0	41.3	2 SE	0 haze	8 1/2	Moonlight	11 1/2	Moonlight	None
5	9 1/4	30.264	54.8	48.3	1 S	8 Pm haze 7m →	9 1/4	Cloudy	9 1/4	Cloudy	Obsc.
6											Obsc.
7	9	30.040	55.0	50.0	1 SE	10 Pm 7m L	9	Cloudy	9	Cloudy	None
8											Obsc.
9	9	30.035	63.9	63.7	3 S	9 Pm 7m →	9	Cloudy	9	Cloudy	Obsc.
10	8 3/4	30.150	66.0	51.5	1 NE	6 P haze	8 3/4	Cloudy	8 3/4	Cloudy	None
11											Obsc.
12											Obsc.
13	10	30.045	64.3	52.8	1 SE	0 Rs	10	Moonlight	10	Moonlight	None
14											Obsc.
15											Obsc.
16											Obsc.
17											Obsc.
18											Obsc.
19											Obsc.
20											Obsc.
21											Obsc.
22											Obsc.
23	8 3/4	30.253	64.3	57.7	1 E	9 Pm 7m	8 3/4	Cloudy	8 3/4	Cloudy	None
24	10	30.182	62.9	56.6	1 E	3 Pm haze	10	Haze and Clouds	10	Haze and Clouds	None
25											Obsc.
26	10 3/4	30.062	60.7	57.0	1 S	3 haze	8 1/2	Haze and twilight	10 3/4	None; hazy	None
27											Obsc.
28											Obsc.
29											None
30											Obsc.
31											None

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May 1881.

2, 9½ A.M. Yesterday, clear, warm, growing cloudy towards night; evening cloudy.
2, 11½ P.M. Day cloudy and warm, with a little rain; growing clear during the evening; no aurora seen; Gegenschein now somewhat suspected as below: it seems not to reach κ β λ Virginis on the west, and to extend eastwards about to ι Librae. Its southern side is indefinite at the north.



α 14h 42m
δ −16°
Sun, May 2.5, α 2h 41m.5, δ +15°.7

O.C.W. α 14h 44m, δ −14°

Observations of Gegenschein May 2. 1881.

Gegenschein probably seen and with the boundaries in about the same position as on Saturday night last, though the whole appearance was much fainter and more unsatisfactory - more correctly, perhaps, it seemed to have shifted slightly towards the zenith and to following.

The centre more strongly seen than the other parts and in the position indicated in sketch by a dot.

* μ
* ι Librae } The slight shifting of centre corresponded with shifting as indicated by the whole appearance.

It being late last evening, this record was not made until early this morning.

O. C. Wendell.

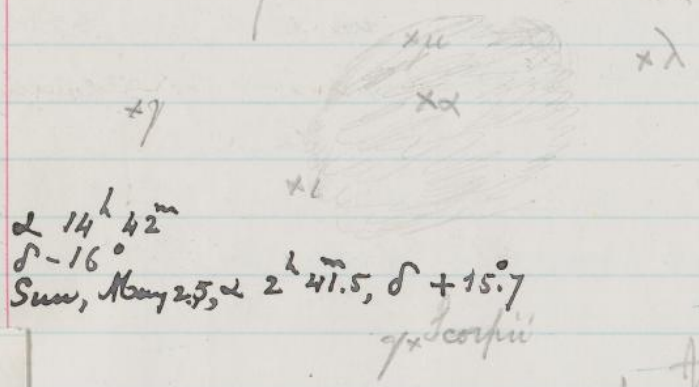
May 3. 1881.

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1880phae.proj.1718W

May 1881.

2, 9½ A.M. Yesterday, clear, warm, growing cloudy towards night; evening cloudy.
2, 11½ P.M. Day cloudy and warm, with a little rain; growing clear during the evening; no aurora seen; Gegenschein now somewhat suspected as below: it seems not to reach κ & λ Virginis on the west, and to extend eastwards about to ι Leibrae. Its southern side is indefinite, although there is some darker sky above γ Scorpii as on April 30: but the light between α Virginis and α Leibrae, or rather along a course rather south of both stars still continues, and confuses the southern part of the supposed Gegenschein. It seems, however, somewhat less distinct than it did April 29; possibly Gegenschein then increased it. It may be a continuation of this band from Coma Berenices to α Virginis. The band from ζ Virginis to α Serpentis is pretty distinct. The great dark region described April 30 remains as at that time; between γ Draconis and α Urs. Min. it extends in a kind of bay towards the Milky Way. This bay contains many very dark patches mixed with lighter ones.

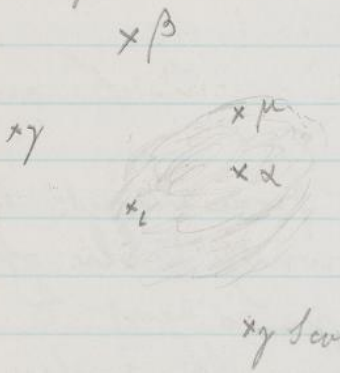


α 14h 42m
δ -16°
Sun, May 2.5, α 2h 41m.5, δ +15°.7
γ Scorpii

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3, 11½ P.M. Day nearly clear, cool; evening clear; no aurora seen. Moon now just setting; bands from Coma Berenices, and from ζ Virginis towards α Serpentis, well seen; γ Geminis slightly suspected as below: observer probably too much prejudiced by previous observations in same lunation.



α 14h 48m
δ −16°.5
Sun, May 3.5, α 2h 45m.5, δ +16°

4, 11½ P.M. Day and evening clear, cool; no aurora seen.
6, 9½ A.M. Yesterday clear, rather warm; clouds increasing after sunset.
7, 9½ A.M. Yesterday cloudy with a little rain; evening cloudy.
7, 11 P.M. Day cloudy at first, then clear; evening clear at times; nearly clear between 10 and 11 P.M.; no aurora seen; then more clouds.
9, 9½ A.M. Yesterday warm at first, afternoon cool with east wind; mostly cloudy, day and evening.
10, 9½ A.M. Yesterday rather clear and warm, evening mostly cloudy; no aurora seen.
10, 9 P.M. Day rather cloudy and warm with a shower in the afternoon; afterwards cooler with thin clouds and some distant lightning; no aurora seen.
11, 9½ A.M. Yesterday evening somewhat more cloudy at 11 P.M.
12, 9½ A.M. Yesterday cloudy at first; clear most of the day; evening mostly cloudy; no aurora seen.
13, 9½ A.M. Yesterday rather clear and hot at first; afterwards cooler and more cloudy; evening cloudy; a few drops of rain. late.
13, 10 P.M. Day cloudy at first, afterwards clear and warm; evening clear; no aurora seen.
15, 9½ A.M. Yesterday clear, warm, graying cloudy towards night; evening

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May, 1881.

16, 9¾ A.M. Yesterday cloudy and cool, day and evening.

17, 9½ A.M. Yesterday cloudy with some rain, day and evening.

18, 9¼ A.M. Yesterday cloudy with some rain, day and evening. The maximum this morning pretty certainly read 44.3 as recorded; probably the reading yesterday afternoon should be 43.1, not 48.1.

19, 9½ A.M. Yesterday cloudy and rainy day and evening; thundershower about 9 P.M.

19, 11 A.M. In compliance with a request from Lieut. A. W. Greely, of the Signal Service, the following table of information about auroras observed here is sent to him. The data for 1870–76 are from the index in book No 50; the remainder from the meteorological record and the reports already sent to the Signal Service. In the left-hand column for each year after 1876 are given the approximate number of evenings sufficiently clear for observations of aurora leaving the effect of moonlight out of account.

	No. aur. 1870	No. aur. 1871	No. aur. 1872	No. aur. 1873	No. aur. 1874	No. aur. 1875	No. aur. 1876	No. per. 1877	No. obs.	No. per. 1878	No. obs.	No. per. 1879	No. obs.	No. per. 1880	No. obs.
Jan.	6	1	6	4	3	0	0	8	1	17	3	16	0	17	0
Feb.	2	5	8	2	2	2	1	14	0	14	0	14	0	20	0
March	9	8	8	7	1	0	0	12	2	14	0	12	0	15	0
April	5	4	11	6	4	1	0	8	2	4	0	14	1	15	1
May	6	7	3	4	0	0	0	16	4	6	0	16	0	17	0
June	1	7	3	10	0	0	0	14	0	13	1	13	1	21	0
July	2	7	4	5	0	0	1	8	0	10	0	10	1	13	2
Aug.	3	5	7	8	0	0	0	9	1	10	0	6	0	16	8
Sept.	7	6	5	5	1	0	2	21	1	14	0	11	0	20	3
Oct.	3	4	6	6	3	0	1	13	0	17	0	12	1	24	4
Nov.	8	9	5	4	1	2	0	8	1	6	1	14	0	22	4
Dec.	8	5	2	2	0	0	0	14	0	16	3	9	2	16	1
Year	60	68	68	63	15	5	5	145	12	141	8	147	6	216	23

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20, 9½ A.M. Yesterday cloudy and cool day and evening, with some rain.
21, 9½ A.M. Yesterday cloudy day and evening; clouds somewhat broken in the afternoon.
22, 9½ A.M. Yesterday cloudy day and evening.
23, 9½ A.M. Yesterday cloudy day and evening, clouds somewhat broken at times; a few drops of rain towards night.
23, 11½ P.M. Day warm, rather clear; evening partly clear; clouds fragment; no aurora seen.
24, 11½ P.M. Day warm, rather clear; evening rather clear, with much haze and some clouds; no aurora seen; band from Coma towards β Virginis somewhat perceptible at present; fainter markings would not be seen.
26, 9½ A.M. Yesterday hazy, becoming cloudy and cool; evening cloudy.
26, 11 P.M. Day at first cloudy and cool, becoming warmer and somewhat clear; evening hazy; no aurora seen.
28, 9½ A.M. Yesterday rather clear and hot, becoming cloudy; evening cloudy.
29, 9½ A.M. Yesterday cloudy and warm, day and evening.
30, 9½ A.M. Yesterday warm and mostly cloudy; somewhat clear at times in the afternoon and evening; no aurora seen.
31, 9½ A.M. Yesterday hot and rather clear; thundershower soon after 7 P.M. and later; a little hail.
June 1, 10½ A.M. Yesterday somewhat clear, cloudy towards night, with thunder; evening mostly cloudy; somewhat clear after 10 P.M.; no aurora seen.

Report to Signal Service, sent June 1, 1881.

Aurora — looked for every clear evening; none seen; evenings generally cloudy at times or throughout.

Zodiacal light — looked for every clear evening; none seen; no evenings during the month favorable to the observation.

Thunder showers; May 10, distant lightning towards night; May 18, thunder shower about 9 P.M.; May 30, thunder shower soon after 7 P.M. and later; a little hail; May 31, cloudy towards night, with thunder.

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1880phae.proj.1718W

June 1881.

Dat.	Time A.M.	Barometer	Attached thermometer	No. 4	Minimum, before and after setting	Maximum, before and after setting		Gauge	Rainfall in inches.	Wind	Clouds	Dat.
1	9½	29.796	67.7	71.1	61.1	70.1	74.4	70.1	0		2 NE	5 Rs Fm →	1
2	9¼	29.833	64.0	61.3	57.0	60.7	71.5	61.0	0 7/8	0.077	2 NE	6 Pm M Fm ∠	2
3	9¼	29.891	60.0	49.7	48.2	49.0	67.4	50.0	0		2 E	10 Pm fog	3
4	9½	29.615	53.3	46.7	43.7	45.9	50.8	46.3	7 1/4	0.640	2 N	10 Pm; raining	4
5	9¼	29.719	55.4	62.7	44.0	62.2	61.8	61.4	0 3/4	0.066	2 SW	0 P Rs haze	5
6	9¼	29.928	58.5	57.9	46.1	54.1	71.5	54.8	1 1/4	0.110	2 N	5 M Fm ↘	6
7	9½	30.206	56.0	58.7	41.2	58.1	64.3	58.2	0		2 E	8 P Rs haze	7
8	9¼	29.824	57.8	54.1	51.3	53.4	64.0	54.0	1 3/4	0.154	1 E	10 Pm fog; fine rain	8
9	9¼	29.962	60.0	65.0	53.2	64.1	64.2	64.1	0 1/4	0.011	2 NE	10 Pm Fm	9
10	9½	30.045	57.0	51.5	48.5	50.8	64.4	51.0	6 3/4	0.596	2 N	10 Pm Fm Cb; raining	10
11	9¼	29.959	52.8	49.8	44.5	49.1	57.2	49.7	see h. 90	2.703	2 NE	10 Pm Fm ∠; mist	11
12	10	30.163	57.0	63.3	47.8	62.3	65.6	62.3	0 1/8	0.011	2 E	2 haze	12
13	9½	30.143	57.1	51.9	48.0	51.5	69.0	52.0	0		1 E	10 Pm	13
14	9¼	29.851	59.3	64.8	51.1	64.0	64.0	64.0	0 1/4	0.022	2 SW	10 Pm Fm →	14
15	9	29.827	63.8	67.4	58.2	66.6	69.8	67.0	0 1/2	0.044	2 NW	0 M Fm	15
16	9½	30.007	58.0	57.8	47.4	57.0	73.9	57.5	0		3 N	0 P Rs	16
17	9½	29.772	59.7	65.1	49.0	64.2	67.4	64.4	0		1 SW	10 P Fm	17
18	9½	29.672	64.8	66.9	59.7	66.0	74.0	66.5	0 1/4	0.022	1 W	1 haze Fm	18
19	9¼	29.681	64.9	69.4	59.3	68.3	73.8	68.2	0		2 SW	10 Pm Fm →	19
20	9¼	29.828	67.6	73.7	57.4	72.8	81.3	72.4	0		1 SW	8 Pm Rs Fm →	20
21	9½	29.665	67.2	66.7	60.1	66.0	77.5	66.5	1	0.088	2 N	5 M Fm	21
22	9¼	29.857	59.6	58.4	46.0	57.8	71.0	58.2	0 1/4	0.022	2 NW	6 M Fm — haze	22
23	9½	29.986	61.0	62.0	50.0	61.2	62.1	61.3	0		2 NW	0 M Fm	23
24	10½	30.070	61.8	64.5	52.6	63.6	70.5	64.0	0		2 N	6 M Fm ↘	24
25	10¾	30.094	64.8	71.4	55.1	70.4	71.0	70.2	0		1 SW	5 M Fm →	25
26	9½	30.144	65.7	69.8	58.5	68.8	76.5	68.7	1	0.088	1 S	9 Rs Fm →	26
27	9¾	30.163	63.0	61.6	54.6	60.7	74.3	60.3	4	0.353	0 W	10 P Fog	27
28	9¾	29.734	66.4	74.6	60.5	73.5	73.5	72.8	3½	0.309	2 SW	8 P M Fm → Fm ↗	28
29	9¾	29.588	69.5	73.5	63.1	72.5	83.5	72.6	3 1/4	0.287	2 W	0 M Fm	29
30	9	29.680	70.3	72.2	62.3	71.1	80.1	71.2	1 1/4	0.110	2 NW	0 M Fm	30
	9.5	896.703 29.890 −.088 29.802	1844.0 61.5	1880.5 62.7	1576.5 52.6	1855.8 61.9	2084.3 69.5	Max. set inside building	See p. 90	5.713 Rainfall for month 5.71 inches.	52 1.7	184 6.1	

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1880phae.proj.1718w

June 1881.

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											None
2											Obsc.
3											Obsc.
4	9 1/4	29.713	57.2	50.8	2 E	5 P haze	9 1/4	Moonlight & haze	9 1/4	Moonlight & haze.	None
5											Obsc.
6	9	30.067	61.0	54.8	1 N	0 Rs	9	Moonlight	9	Moonlight	None
7											Obsc.
8											Obsc.
9											Obsc.
10											Obsc.
11	9	30.038	57.2	55.8	0 calm	0 P haze	9	Moonlight	9	Moonlight	None
12											Obsc.
13											Obsc.
14	9 3/4	29.778	62.7	60.1	1 S	3 Pm 7m haze	9 3/4	Clouds and haze	9 3/4	Clouds and haze	None
15	9 1/2	29.987	66.8	59.8	2 N	0	9 1/2	Suspected in haze	9 1/2	None	None
16	9 1/2	29.914	63.6	56.1	1 S	1 P 7m haze	9 1/2	Haze and twilight	9 1/2	None; some clouds,	None
17	8 3/4	29.677	67.6	62.8	1 S	5 Pm 7m \	8 3/4	Twilight	8 3/4	Cloudy	None
18	9 1/2	29.764	69.7	64.2	1 S	5 Pm 7m \	9 1/4	Twilight and clouds	9 1/4	None; some clouds	None
19	11 1/4	29.812	70.8	65.6	1 NW	1 Pm haze	11 1/4	Haze and clouds	11 1/4	None	None
20											Obsc.
21	9 1/4	29.767	67.2	56.4	2 NW	0 Rs	9 1/4	Twilight	9 1/4	None	None
22	11 1/4	29.936	63.8	53.7	1 E	5 haze	11 1/11	Haze	11 1/11	Haze	None
23	10 1/4	30.021	65.9	55.3	1 N	6 Pm 7m haze	10 1/4	Cloudy	10 1/4	Cloudy	None
24	10 3/4	30.092	67.6	59.5	1 W	1 Pm haze	10 3/11	Clouds	10 3/11	None	None
25	9 3/4	30.430	70.9	63.6	2 S	1 P 7m haze	9 3/4	Twilight & haze	9 3/11	None	None
26	11	30.149	65.9	57.3	0 W	1 P haze	11	Haze	11	None	None
27											Obsc.
28											Obsc.
29											None
30											None

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June 1881.

2, 9¼ A.M. Yesterday warm and variable; stars somewhat visible at times in the evening; no aurora seen; rain about 11 P.M.

3, 9¼ A.M. Yesterday rather clear and warm, becoming cloudy and cool towards night; evening cloudy.

4, 9½ A.M. Yesterday cloudy and cool day and evening with a little rain; more rain during the night and early today.

4, 11¼ P.M. Day at first cloudy and cool, with rain; clearing off about 3 P.M.; evening cool, very hazy; no aurora seen.

6, 9¼ A.M. Yesterday clear and warm, becoming cloudy; evening rainy.

6, 11½ P.M. Day and evening clear, rather cool; no aurora seen.

8, 9¼ A.M. Yesterday mostly cloudy; clouds increasing towards night, with a little rain; evening cloudy.

9, 9¼ A.M. Yesterday cloudy day and evening, with a few drops of rain.

10, 9½ A.M. Yesterday cloudy day and evening; rain following night and this morning.

10, 4½ P.M. Day rainy with strong north wind; gauge now 25½ ounces; 2.251 inches; still raining.

11, 9¼ A.M. Yesterday evening cloudy with some rain. Gauge now 5⅛ ounces; 0.452 inches; total since yesterday morning 2.703 inches.

12, 10¼ A.M. Yesterday cloudy at first with a little fine rain; clear towards night; evening rather foggy at times; dense fog after 1 A.M. this morning; no aurora seen.

13, 9½ A.M. Yesterday clear and warm; fog came on before 8 P.M.; cloudy later.

14, 9¼ A.M. Yesterday cloudy and cool; somewhat clear for a time in the afternoon; evening foggy and cloudy.

14, 10 P.M. Day cloudy and warm, with some rain; evening partly clear, with frequent clouds and haze; no aurora seen; a little lightning at the northwest.

16, 9½ A.M. Yesterday clear and cool day and evening; no aurora seen. Zodiacal light suspected in Leo at 9½ P.M., although there was still much twilight; if present it [illegible]

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on the northern side, and its central line was estimated both by A.S. and O.C.W. to be decidedly north of α Leonis.

16, 11½ P.M. Day clear and cool, evening somewhat cloudy and hazy, clearer later; no aurora seen.

18, 9½ A.M. Yesterday nearly clear, warm; evening partly cloudy after 8 P.M.; clouds increasing; no aurora seen.

19, 9¼ A.M. Yesterday partly cloudy, warm; evening partly cloudy; no aurora seen.

19, 11¼ P.M. Day cloudy at first, afternoon and evening nearly clear; no aurora seen; clouds now low in the south, with lightning.

21, 9½ A.M. Yesterday cloudy day and evening.

21, 10¾ P.M. Day rather cloudy, with slight showers about 2 P.M.; evening clear; no aurora seen.

22, 11¼ P.M. Day mostly clear; evening somewhat clear, with thick haze and some clouds; no aurora seen.

23, 10¼ P.M. Day mostly clear, evening partly clear; no aurora seen.

24, 10¾ P.M. Day mostly clear; evening mostly clear; no aurora seen.

26, 10 A.M. Yesterday mostly clear; evening nearly clear at first, becoming cloudy after 11 P.M.; no aurora seen; a little rain early this morning.

26, 11 P.M. Day mostly cloudy with some rain and a little thunder; evening mostly clear with some haze; no aurora seen; fog after 11 P.M. becoming thick.

28, 9¾ A.M. Yesterday cloudy, with rain in the evening and following night.

29, 9¾ A.M. Yesterday mostly cloudy, with rain in the evening; some thunder and lightning also reported; clear after 1 A.M. today; no aurora seen.

30, 9 A.M. Yesterday clear; clouds with thundershower after 8 P.M.; no aurora seen.

July 1, 9¼ A.M. Yesterday rather cloudy with occasional showers day and evening; no aurora seen.

Report to Signal Service, sent July 2, 1881.

Aurora looked for every clear evening; none seen.

Zodiacal light slightly suspected June 15.

Thunder showers; June 14: a little lightning at the northwest in the evening; June 19, 11¼ P.M., lightning in the south; June 26, some rain and a little thunder; June 28, thunderstorm in the evening; June 29 thunder showers after 8 P.M.

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July 1881.

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
1	9¼	29.926	66.3	67.2	57.8	66.3	79.0	65.2	5	0.441	2 N	1 7m
2	10¼	30.191	66.3	67.5	54.0	66.9	78.0	66.2	6¼	0.552	1 N	0 7m
3	9½	30.029	68.0	72.3	61.1	71.2	79.3	71.0	0		1 SW	9 Pm 7m
4	10	29.906	71.0	76.2	63.0	75.2	82.0	75.3	0		1 N	8 Pm M 7m →
5	9¾	29.972	68.4	68.8	57.2	68.0	80.4	68.0	0½	0.044	1 E	1 Pa M 7m
6	9½	29.812	70.9	76.9	64.2	76.0	76.2	76.0	0		2 N	4 Pm 7m → haze
7	9½	30.104	69.6	74.4	60.0	73.3	82.3	73.2	0		1 NW	7 Pm 7m →
8	9½	30.072	71.0	67.7	64.2	66.9	82.5	67.6	2⅝	0.232	2 NE	10 Pm 7m
9	9¾	30.131	70.0	73.3	59.4	72.6	78.2	72.5	0		1 S	0 Rs 7m
10	9½	30.107	71.0	75.4	61.8	74.0	83.9	73.9	0		1 SW	0 7m
11	9	30.035	74.9	70.3	68.2	69.7	87.0	70.2	0		3 NE	10 Pm
12	9½	30.057	69.6	70.7	56.1	69.8	70.2	70.0	4⅞	0.479	1 S	5 Rs haze
13	9½	29.889	71.2	72.3	63.7	71.3	77.0	71.8	0		1 SW	10 P
14	9¼	29.932	74.5	75.8	67.8	74.9	86.4	75.0	0		3 NW	3 M 7m →
15	9½	30.158	69.8	71.2	60.2	70.0	80.0	70.2	0		2 E	0
16	10½	29.945	71.7	78.2	61.0	77.1	78.2	76.7	0		2 SW	1 Rs 7m →
17									See 1.95 ~~0~~	~~0.086~~		
18												
19									See 1.95	0.066		
20	9½	29.809	67.7	72.1	53.1	71.1	83.1	71.0	0		1 W	10 Pm 7m →
21	9½	29.634	70.2	67.0	64.5	66.1	80.0	66.9	1½	0.132	1 SW	10 Pm M 7m →
22	10½	29.683	68.9	70.4	60.2	69.3	79.8	70.0	See 1.96	0.463	2 NW	9 Pm M 7m →
23	9½	29.740	70.2	66.5	63.8	65.7	77.7	66.3	0		2 NE	10 Pm 7m
24												
25									See 1.96	0.022		
26	9½	29.870	72.0	69.7	58.0	69.0	83.6	69.3	See 1.96	1.081	1 S	10 Pm; heavy rain
27	9¼	29.868	71.0	71.4	62.8	70.4	78.0	70.7	2⅜	0.210	1 W	6 P Rs
28												
29	9½	30.172	69.2	63.5	60.0	63.0	79.3	63.6	0⅛	0.011	1 NE	10 P mist
30	9	30.357	68.0	62.4	60.9	61.8	68.0	62.3	0		1 NE	10 P; a little mist
31	9.6	29.404 / 29.975 / 29.864	1681.4 / 70.1	1701.2 / 70.9	1463.0 / 61.0	1679.6 / 70.0	1910.1 / 79.6	Max. set inside building	See 1.95, 96	3.683 Rainfall for month 368 inches.	35 / 1.5	144 / 6.0
Aug. 1	10⅔	30.160	71.5	79.6	60.6	76.0	78.3	78.0			4 S. W.	7 Cir. Cum.

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1880phae.proj.1748w

July 1881.

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	10 3/4	30.067	69.7	60.6	1 NE	1 P haze	10 3/4	Slightly suspected	10 3/4	None	None
2	9	30.121	73.9	66.9	2 S	0 P Rs 7m	9	Moonlight	9	Slightly suspected; clouds	Aurora
3	9 1/4	29.947	75.7	72.0	0 calm	5 P 7m \	9 1/4	Moonlight & clouds	9 1/2	Moonlight & clouds.	None
4	10 1/2	29.938	73.8	64.1	1 S	1 Pm 7m	10 1/2	Moonlight & clouds	10 1/2	Moonlight	None
5	9 1/4	29.900	74.2	67.5	1 E	0 P haze	9 1/4	Moonlight	9 1/4	Moonlight	None
6	10 3/4	30.017	73.7	63.5	1 SW	5 P Rs 7m	10 3/4	Moonlight & clouds	10 3/4	Moonlight & clouds	None
7	~~9 1/2~~	~~30.092~~	~~75.9~~	~~67.8~~							Obsc.
8	9 1/2	30.092	75.9	67.8	1 S	0 haze	9 1/2	Moonlight	9 1/2	Moonlight	None
9	10	30.150	76.2	67.6	2 S	0	10	Moonlight	10	Moonlight	None
10											None
11											Obsc.
12	9 1/2	30.012	75.8	69.1	1 S	8 Pm 7m	9 1/2	Moonlight & clouds	9 1/2	Moonlight & clouds	Obsc.
13	10 1/2	29.786	78.4	76.8	1 S	6 Rs 7m →	10 1/2	Moonlight & clouds	10 1/2	Moonlight & clouds	None
14	11 11/12	30.073	74.8	66.1	1 S	0 Rs	11 11/12	Moonlight	11 11/12	Moonlight	None
15	9 3/4	30.102	76.0	66.7	1 SE	0 P Rs haze	9 3/4	Moonlight	9 3/4	Moonlight	None
16											Blank
17											Blank
18	9 1/4	29.544	68.5	58.5	1 S	3 P 7m \	9 1/4	Twilight & clouds	9 1/4	Twilight & clouds	None
19	10 1/2	29.764	71.2	63.7	1 S	0 haze	10 1/2	None	10 1/2	None	None
20											Obsc.
21	11 3/4	29.691	71.8	63.7	1 NW	0	11 3/4	None	11 3/4	None	None
22	11	29.700	73.6	66.3	1 N	9 P 7m	11	Cloudy	11	Cloudy	None
23											Blank
24											Blank
25											Obsc.
26	10	29.858	74.7	71.0	1 N	5 P	10	Cloudy	10	None; some clouds	None
27											Blank
28											Obsc.
29											Obsc.
30											Blank
31											Blank
Aug. 1	10	30.17	76.1	73.8	1 S	5 Pm					

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July, 1881.

1, 10¾ P.M. Day partly clear, with a thundershower about 2½ P.M., with a little hail; shower in the evening; rather clear now; no aurora seen.

2, 10¼ A.M. No aurora at 12¾ A.M. today.

2, 9½ P.M. At 9½ P.M. very obvious irregular aurora, streamers reaching beyond Polaris; at 9 24/60 P.M. there was a narrow streak nearly through β Draconis and a little north of ε Bootis, not much extended east of the meridian, which was perhaps auroral; otherwise a cloud.

2, 10½ P.M. Aurora continued among increasing clouds; now mostly cloudy.

3, 9½ A.M. A few drops of rain early this morning.

4, 12¼ A.M. Yesterday cloudy with a few drops of rain; evening cloudy, becoming nearly clear; much lightning, especially in the south. No aurora seen.

4, 10½ P.M. Day somewhat cloudy, with slight thunder shower in the afternoon; evening mostly clear; no aurora seen.

5, 11 P.M. Day mostly clear, somewhat cloudy in the afternoon; evening nearly clear at first; no aurora seen; now mostly cloudy.

6, 11 P.M. Day somewhat cloudy; evening clear at first, rather cloudy after 10½ P.M.; no aurora seen.

8, 9½ A.M. Yesterday rather cloudy, clouds increasing; evening cloudy; rain early today.

8, 11 P.M. Day cloudy at first, now clear; evening mostly clear, with thin clouds at times; no aurora seen.

9, 11¾ P.M. Day and evening clear, warm; no aurora seen.

11, 9½ A.M. Yesterday clear, hot; thin clouds after about 7 P.M.; no aurora seen.

12, 9½ A.M. Yesterday cloudy with rain at times; evening cloudy.

13, 9½ A.M. Yesterday somewhat cloudy and warm; evening mostly cloudy; no aurora seen.

13, 11 P.M. Day mostly cloudy, gradually clearing off between 9 and 11 P.M.; nearly clear now; no aurora seen.

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

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1000pine.proj.17.tow

16, 4½ A.M. Yesterday clear; night clear with some passing clouds; no aurora seen.

19, 4 A.M. July 16, increasing cloudiness and a few drops of rain in the afternoon; July 18, mostly cloudy with a little rain; clearing off 6 P.M. and later; evening partly clear with passing clouds until after midnight; nearly clear 1 A.M. today and later; no aurora seen.

19, 11½ A.M. Barom. 29.633; attached therm. 66.4; No. 4, 70.0; mostly cloudy; Gauge $0\frac{3}{4}$ ounces.

20, 12½ A.M. Yesterday clear, warm; evening mostly clear; no aurora seen; clouds increasing after 11 P.M.; no distinct zodiacal light at any time; twilight until about 9½ P.M.; afterwards a slight suspicion of zodiacal light between Virgo and Libra; noticed that τ and λ Sagittarii point along the lower edge of the branch of the Milky Way which crosses the space between the two main branches; the line of stars in Serpens, α, ε, etc., points towards the middle of this bridge; ζ and δ Sagittarii point along the upper edge of a less distinct bridge below; between the two bridges the space between the chief branches of the Milky Way is rather dark, but broken by some irregular patches of light. The branch from Aquila into Aquarius was perceptible at 10½ P.M. although there was haze below; still, near α Capricorni, the sky was relatively dark.

21, 9½ A.M. Yesterday mostly cloudy and warm; evening cloudy; light showers with lightning about 1 to 2 A.M. this morning, with more rain and thunder later.

22, 2½ A.M. Yesterday cloudy with occasional thunder showers clearing off towards evening; clear after 8 P.M.;

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July, 1881.

1, 10¾ P.M. Day partly clear, with a thundershower about 2½ P.M., with a little hail; shower in the evening; rather clear now; no aurora seen.

2, 10¼ A.M. No aurora at 12¾ A.M. today.

2, 9½ P.M. At 9¼ P.M. very obvious irregular aurora, streamers reaching beyond Polaris; at 9 24/60 P.M. there was a narrow streak nearly through β Leonis and a little north of α Bootis, not much extended east of the meridian, which was perhaps auroral; otherwise a cloud.

2, 10½ P.M. Aurora continued among increasing clouds; now mostly cloudy.

3, 9½ A.M. A few drops of rain early this morning.

4, 12¼ A.M. Yesterday cloudy with a few drops of rain; evening cloudy, becoming nearly clear; much lightning, especially in the south. No aurora seen.

4, 10½ P.M. Day somewhat cloudy, with slight thunder shower in the afternoon; evening mostly clear; no aurora seen.

5, 11 P.M. Day mostly clear, somewhat cloudy in the afternoon; evening nearly clear at first; no aurora seen; now mostly cloudy.

6, 11 P.M. Day somewhat cloudy; evening clear at first, rather cloudy after 10½ P.M.; no aurora seen.

8, 9½ A.M. Yesterday rather cloudy, clouds increasing; evening cloudy; rain early today.

8, 11 P.M. Day cloudy at first, soon clear; evening mostly clear, with thin clouds at times; no aurora seen.

9, 11¾ P.M. Day and evening clear, warm; no aurora seen.

11, 9¼ A.M. Yesterday clear, hot; thin clouds after about 7 P.M.; no aurora seen.

12, 9½ A.M. Yesterday cloudy with rain at times; evening cloudy.

13, 9½ A.M. Yesterday somewhat cloudy and warm; evening mostly cloudy; no aurora seen.

13, 11 P.M. Day mostly cloudy, gradually clearing off between 9 and 11 P.M.; nearly clear now; no aurora seen.

14, 11¼ P.M. Day and evening clear; no aurora seen.

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16, 4½ A.M. Yesterday clear; night clear with some passing clouds; no aurora seen.

19, 4 A.M. July 16, increasing cloudiness and a few drops of rain in the afternoon; July 18, mostly cloudy with a little rain; clearing off 6 P.M. and later; evening partly clear with passing clouds until after midnight; nearly clear 1 A.M. today and later; no aurora seen.

19, 11½ A.M. Barom. 29.633; attached therm. 66.4; No. 4, 70.0; mostly cloudy; Gauge $0\frac{3}{4}$ ounces.

20, 12½ A.M. Yesterday clear, warm; evening mostly clear; no aurora seen; clouds increasing after 11 P.M.; no distinct zodiacal light at any time; twilight until about 9½ P.M.; afterwards a slight suspicion of zodiacal light between Virgo and Libra; noticed that τ and λ Sagittarii point along the lower edge of the band of the Milky Way which crosses the space between the two main branches; the line of stars in Serpens, α, ε, etc., points towards the middle of this bridge; ζ and δ Sagittarii point along the upper edge of a less distinct bridge below; between the two bridges the space between the chief branches of the Milky Way is rather dark, but broken by some irregular patches of light. The branch from Aquila into Aquarius was perceptible at 10½ P.M. although there was haze below; still, near α Capricorni, the sky was relatively dark.

21, 9½ A.M. Yesterday mostly cloudy and warm; evening cloudy; light showers with lightning about 1 to 2 A.M. this morning, with more rain and thunder later.

22, 2½ A.M. Yesterday cloudy with occasional thunder showers clearing off towards evening; clear after 8 P.M.;

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July 1881.

22, 11½ A.M. Gauge 5¼ ounces; 0.463 inches.
22, 11 P.M. Day rather clear, cloudy towards night; evening mostly cloudy; no aurora seen.
23, 9½ A.M. Cloudy at 5½ A.M. today.
25, 12 M. July 23 cloudy with a little rain; gauge now 0¼ ounces; mostly clear at present.
26, 9½ A.M. Yesterday rather clear, growing cloudy towards night; cloudy most of the evening; and between 1 and 2 A.M. today; thunder showers later; rain very heavy at present.
26, 10 A.M. Gauge 12¼ ounces; 1.081 inches.
26, 10 P.M. Day sultry with thunder showers; somewhat clear after 3 P.M.; evening partly clear with much lightning to the north; no aurora seen.
29, 9½ A.M. July 27 and 28 rather cloudy; evening of July 28 cloudy and foggy.
30, 9 A.M. Yesterday cloudy day and evening.

Report to Signal Service, sent August 2, 1881.

Aurora looked for, in general, every clear evening: no observations on July 16, 17, 23, 24, 27, 30, 31, (these evenings mostly cloudy); on July 2, aurora slightly suspected at 9 P.M., very obvious at 9¼ P.M.; irregular, with streamers reaching beyond Polaris; at 9 24/60 P.M., there was a narrow streak, perhaps auroral, nearly through β (Beta) Leonis and a little north of Arcturus, not much extended east of the meridian; aurora still visible among clouds at 10½ P.M.

Zodiacal light slightly suspected between Virgo and Libra after 9½ P.M. July 19.

Thunder showers July 1, about 2½ P.M., thundershower with a little hail; July 3, evening much lightning especially in the south;

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July 21, 1 to 2 A.M., light showers, with lightning, followed later by more rain and thunder, with occasional thunder showers during the day; July 26, thunder showers early, with heavy rain about 9½ A.M., and much lightning at the north in the evening.

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August 1881.

Date	Time A.M.	Barometer	Attached thermometer	No. 1	Minimum, before and after setting		Maximum, before and after setting		Gauge	Rainfall in inches	Wind	Clouds
1	$10\frac{2}{3}$	30.160	71.5	79.4	60.6	76.0	78.3	78.0	See p. 100	0.221	4 SW (see pp. 102, 103)	7 Rm (see pp. 102, 103)
2	$9\frac{3}{4}$	30.180	73.7	76.7	67.4	75.9	84.5	75.9	0		1 SW	6 P Ro Fm
3	$9\frac{3}{4}$	30.100	72.8	73.4	65.1	72.2	81.0	72.5	See p. 100	0.022	0 calm	8 P haze Fm L
4	$9\frac{1}{2}$	30.094	72.7	76.5	63.8	75.5	80.1	75.4	0		1 NE	6 P haze
5	$9\frac{1}{2}$	30.064	76.0	82.1	70.8	81.1	84.0	81.0	0		1 SW	7 P haze Fm
6	$9\frac{1}{4}$	30.022	77.2	79.6	71.5	78.4	90.1	78.5	0		1 SW	7 P haze
7	$9\frac{1}{2}$	29.924	77.0	73.5	71.8	72.8	85.6	73.3	$0\frac{1}{2}$	0.044	1 SW	10 Rm Fm 1; some rain
8	$9\frac{1}{2}$	29.958	71.9	65.1	62.3	64.6	77.0	65.2	$2\frac{1}{4}$	0.199	2 NW	10 Rm Fm
9	$9\frac{3}{4}$	29.950	69.3	68.6	57.0	68.0	74.2	68.2	0		1 SW	9 Rm Fm →
10	$9\frac{1}{2}$	29.617	72.9	77.3	67.2	76.2	78.8	76.5	$0\frac{1}{2}$	0.044	2 W	0 haze Fm
11	$9\frac{1}{2}$		~~67.3~~									
12												
13												
14												
15	$9\frac{1}{2}$	29.731	69.3	66.8	56.8	66.2	80.8	67.6		N	6 N.E. (see pp. 102, 103)	~~5 Rm~~ 7 (see pp. 102, 103)
16	9	30.182	68.0	62.7	58.3	62.1	68.5	65.3			8 N. E (see pp. 102, 103)	10 (see pp. 102, 103)
17	$9\frac{1}{2}$	30.200	64.1	64.1	52.2	63.2	65.3	57.1			7 N. E (see pp. 102, 103)	10 (see pp. 102, 103)
18	$9\frac{1}{2}$	30.098	63.6	59.3	52.9	58.7	60.7	59.9			3 N. E (see pp. 102, 103)	10 (see pp. 102, 103)
19	$9\frac{1}{4}$	29.900	65.4	64.9	58.6	64.0	64.7	64.0	4	0.353	1 NE	10 Rm, fine rain
20	$9\frac{1}{2}$	29.828	65.8	64.2	59.9	63.3	68.3	64.0	$0\frac{1}{8}$	0.011	1 NE	10 Rm
21	9	29.731	68.0	68.9	61.2	68.0	73.4	68.5	$0\frac{1}{4}$	0.022	1 N	8 Rm Fm
22	$9\frac{1}{2}$	29.812	70.0	71.7	61.2	70.5	76.8	70.8	$4\frac{3}{4}$	0.419	2 NW	0 Fm
23	$9\frac{1}{2}$	30.008	69.0	69.7	54.0	68.5	78.9	69.0	0		2 NW	3 M Fm →
24	$9\frac{1}{2}$	30.280	68.5	63.1	61.1	62.4	74.9	63.3	0		2 NE	10 Rm Fm L
25	$9\frac{1}{4}$	30.330	65.5	66.0	54.1	65.2	65.2	65.2	$0\frac{1}{8}$	0.011	1 S	9 Rm Fm →
26	$9\frac{1}{2}$	30.278	66.7	67.2	57.7	66.6	75.3	67.0	0		1 S	0
27	9	30.249	70.0	69.5	64.1	68.6	78.9	69.1	0		1 SW	10 P haze
28	$9\frac{1}{2}$	30.140	71.0	72.7	63.0	71.8	81.4	72.0	0		1 NW	6 P haze
29	$9\frac{1}{2}$	30.244	71.4	72.2	62.4	71.1	82.4	71.5	0		2 N	2 Ro haze
30	10	30.267	69.7	74.0	60.0	73.1	78.0	73.0	0		2 SW	2 P R haze
31	$9\frac{3}{4}$	30.119	74.1	76.8	65.0	76.0	85.8	75.9	0		1 SW	4 haze
	9.5	811.668 / 30.062 / −.111	1895.1 / 70.2	1906.2 / 70.9	1665.0 / 61.7	1880.2 / 69.6	2072.9 / 76.8	Max. set inside	See p. 100	1.346 Rainfall for month	28 / 1.3	187 / 6.7 (see pp. 102, 103)

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August 1881.

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	10 2/3	30.170	76.1	72.0	1 SW	8 P. haze					Blank
2											None
3											None
4											None
5											Obsc.
6											Obsc.
7											Obsc.
8	9	30.002	73.9	67.5	0 calm	0	9	Moonlight	9	Moonlight	None
9											Obsc.
10	9 1/2	29.774	76.0	67.0	2 NW	0 7m	9 1/2	Moonlight	9 1/2	Moonlight	Obsc.
11											Blank
12											Blank
13											Blank
14											Blank
15	7 1/2	30.064	70.0	63.0	1 W.						Blank
16	7 1/2	30.200	70.9	69.9	4 E.N.E.						Blank
17	11 1/4	30.084	67.0	58.8	6 N.E.						Blank
18											Obsc.
19											Obsc.
20											Obsc.
21	9	29.719	72.4	67.8	0 calm	1 7m fog	9	Cloudy	9	None; some clouds	None
22	8 1/2	29.930	76.0	68.7	1 S	0 P	8 1/2	Suspected	8 1/2	None; some clouds	None
23											Obsc.
24											Obsc.
25	10 1/2	30.289	69.3	61.9	1 SE	0 haze	8	Hazy	10 1/2	None	None
26	10	30.238	73.8	67.8	1 S	5 haze	10	Hazy	10	None; haze	None
27	8 1/2	30.164	75.7	70.3	1 S	4 haze	8 1/2	Hazy	8 1/2	None; haze	None
28	9	30.176	76.6	70.1	1 NW	5 haze 7m	9	Hazy	9	None; haze	None
29	9	30.268	71.7	63.5	0 calm	2 haze	9	Suspected	9	None	None
30	10 3/4	30.208	78.0	71.6	1 S	3 haze	7 1/2	Moonlight	10 3/4	None; haze	None
31	11 1/4	29.950	79.8	74.7	1 SW	5 haze	8	Hazy	11 1/4	None	None

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August 1881.

2, 9¾ A.M. Barom. 30.180; attached therm. 72.7; No. 4, 76.7; min. 67.4; after setting 75.9; max. 84.5; after setting 75.9; gauge 0; wind 1, SW; clouds 6, P Rs 7m.

2, 6½ P.M. The observations above copied on page 98; also observations of August 1 by Mr. Wendell, copied on pp. 899; the original records are at the foot of pp. 92, 93; the rainfall measured by Mr. Wendell August 1 by pasting a piece of paper upon the bottle belonging to the rain gauge to mark the height of the water; the bottle then emptied; on filling it to the height indicated, with Fresh Pond water, the weight appears to be 2½ ounces; 0.221 inches; entered accordingly as the observation of August 1 on p. 98. Before this experiment, the bottle was found to contain 0⅛ ounces; 0.011 inches; consisting of a few drops found this morning with a few more fallen since, probably about 3 P.M., when there seemed to be a shower to the southeast. This amount is accordingly to be entered under date of August 3.

3, 9¾ A.M. Yesterday mostly cloudy; growing clear in the evening; nearly clear at 10½ P.M.; no aurora seen; at 10½ P.M. galactic light from Aquila towards Aquarius rather well seen, in usual form; cloudy early this morning; gauge now 0⅛ ounces, making with that found yesterday 0¼ ounces in all; 0.022 inches.

4, 9½ A.M. Yesterday rather clear day and evening; at 10¾ P.M. rather clear but hazy; no aurora seen.

5, 9½ A.M. Yesterday rather clear with much haze day and evening; haze rather thick at 10½ P.M.; no aurora seen.

6, 9½ A.M. Yesterday rather clear with much haze day and evening; haze thick at 10¾ P.M.; no aurora seen.

7, 9½ A.M. [illegible]

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very thick in the evening, with some clouds; rain early today.

8, 9½ A.M. Day and evening of yesterday cloudy and warm, with occasional showers.

8, 11¼ P.M. Day cloudy and somewhat cool, becoming clear towards night; evening clear; no aurora seen.

10, 9½ A.M. Yesterday cloudy and warm; evening cloudy, with rain about 10 P.M.

11, 3¾ A.M. Barom. 29.810; attached therm. 71.3; No. 4, 58.3. Yesterday mostly rather clear, with passing clouds; evening and night nearly clear, with a few clouds at times; no aurora seen.

15 9½ A.M. Obs. by J. R. Edmands, assisted in estimating wind and cloud by Mr. Wendell. The record 7 Cumulus for the clouds is not according to the system ordinarily employed by Mr. Shaw.

15. 7½ P.M. Clouds Cum. Stratus 1. W. obs.

16. 9 A.M. Clouds 10. Stratus and Nimbus. W. obs.

16. 7½ P.M. Clouds 7. Cum. Stratus. W. obs.

17. 9½ A.M. Clouds 10. Stratus and nimbus. W. obs.

17. 11½ P.M. Clouds. 10. Nimbus. A light rain. W. obs.

18. 9½ A.M. Clouds 10. Nimbus. Very fine rain. W. obs.

19, 9¼ A.M. Yesterday afternoon and evening cloudy.

20, 9½ A.M. Yesterday cloudy day and evening, with a little rain.

21, 9 A.M. Yesterday cloudy and rather warm; afternoon partly clear at times; evening cloudy.

21, 10½ P.M. Mostly cloudy and warm, with showers in the afternoon; evening rather clear, now nearly cloudy; no aurora seen.

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August, 1886

2, 11 P.M. Day mostly clear, warm; evening rather clear, with some haze and clouds; no aurora seen; zodiacal light suspected in Libra and between Libra and Scorpius early in the evening.

2, 9½ A.M. Yesterday cloudy most of the day and evening, with a few drops of rain about 6 P.M.; partly clear 11 P.M., especially in the east; no aurora seen.

25, 9¼ A.M. Yesterday cloudy and rather cool day and evening; stars somewhat visible here and there about 11 P.M.

25, 11 P.M. Day clear, growing rather warm; evening clear, but hazy; no aurora seen. Band from Aquila thought to be visible, notwithstanding haze about as far as 27 Piscium; there seems to be a little reinforcement of the light about λ Aquarii, extending southwards nearly to δ Aquarii, but this is uncertain.

Place of λ Aquarii $22^h 46^m, -8°$
Place of Sun $10^h 20^m, +10°$

27, 9 A.M. Yesterday warm, rather clear; evening hazy, haze variable, increasing on the whole; becoming thick with uniform cloudiness about 1¾ A.M. today.

28, 9¼ A.M. Yesterday hazy rather hot; evening hazy; cloudy with a few drops of rain at 3¾ A.M. today; no aurora seen.

29, 9½ A.M. Yesterday hazy and hot; evening hazy; a few clouds; no aurora seen.

30, 10 A.M. Yesterday hazy, rather hot; evening less hazy than for some days past; no aurora seen.

30, 10¼ P.M. Day hazy and rather hot with some thin clouds towards night; these clouds became less visible as the moon went down, and were not seen after 2ᵏ, either because they actually disappeared or because they could only be seen by moonlight; no aurora seen.

31, 1½ P.M. Observations on August 1, 15, 16, 17, 18, by O. C. Wendell and J. R. Edmands. The observations of wind on

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these dates are not made on the same system as on the remainder, and have accordingly been omitted in taking the mean. On the other hand, the observations of quantity of cloud for the same dates are upon the same system with the rest, and have been copied in from pp. 92, 101, so far as the morning observations are concerned, and included in the mean.

31, 11¼ P.M. Day hot, hazy; haze thick at sunset, slightly decreasing during the evening; no aurora seen.

Report to Signal Service, sent Sept. 1, 1881.

Aurora. None seen.

Zodiacal light Slightly suspected Aug. 22 and 29.

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September 1881.

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
1	9 3/4	29.894	75.9	79.7	70.0	78.3	90.0	78.3	0		2 SW	7 haze
2	9 3/4	29.968	73.5	64.8	64.0	64.1	89.9	64.9	0		2 NE	10 Pm
3	9 1/2	29.995	67.5	61.6	58.2	60.6	55.0	61.0	15 3/4	1.390	2 NE	10 Pm
4	9 1/2	30.136	66.0	62.5	58.6	62.0	63.3	62.5	0 1/4	0.022	1 E	10 Pm Fm
5	9 3/4	30.212	66.1	64.8	60.1	63.9	64.8	64.3	0		1 S	10 Pm; a few drops of rain
6	9 1/2	30.079	69.0	72.1	63.9	71.1	71.5	71.0	0		1 SW	10 Pm
7	9 3/4	30.029	73.0	82.0	68.1	81.8	81.2	81.0	0		1 W	3 haze
8	9 3/4	30.200	75.7	69.8	68.8	69.1	92.6	70.4	0		2 E	2 haze Fm
9	9 1/2	30.132	68.8	68.2	57.2	67.2	70.5	67.9	0		2 SW	6 P haze
10	10	30.184	70.9	64.9	64.1	64.1	74.0	65.0	0		2 NE	10 Pm
11	9 1/2	30.050	66.2	61.8	58.4	61.1	65.0	61.6	1 1/4	0.110	2 NE	10 Pm; fine rain
12	9 1/2	29.963	67.0	64.9	61.0	64.1	66.6	64.8	1 3/4	0.154	1 N	10 Pm; raining
13	9 1/2	30.066	62.9	62.0	52.5	61.3	66.2	61.6	1 5/8	0.143	1 NW	2 haze
14	9 1/2	30.244	63.0	62.4	52.0	61.2	73.3	61.8	3 3/8	0.298	2 NE	1 haze
15	9 1/2	30.426	66.0	62.1	58.2	61.4	67.0	62.1	0		2 NE	7 haze Fm
16	9 1/2	30.463	64.6	63.0	55.8	62.4	63.2	63.0	0		2 and 3 E	9 Pm
17	10	30.436	64.6	61.8	55.6	61.4	65.4	63.6	0		1 and 2 NE	7 Pm
18												
19												
20	9 1/2	29.945	64.4	66.3	45.8	65.6	72.8	66.4	0 see p 111		NW	5 (2 az) Haze
21												
22	9 1/2	30.239	61.0	60.6	48.2	60.4	75.6	60.7	0 see p 111		S 2 S.	10 P
23	10	30.059	66.0	71.8	59.8	70.6	71.0	70.3	0 see p 111		2 SW	1 R and 3 Haze
24	9 1/2	30.122	67.6	62.8	62.6	62.6	80.0	63.8	8 see p 111	0.706	2 E	10 P
25	9 3/4	30.047	65.8	71.0	59.4	70.4	70.6	70.4	0		1 NE	(clear)
26		~~30.104~~	~~73.0~~	~~72.8~~	~~65.8~~	~~71.9~~	~~84.7~~	~~72.2~~	~~0 3/4~~		~~0 calm~~	~~2 haze Fm~~
27	9 3/4	30.104	73.0	72.8	65.8	71.9	84.7	72.2	6 3/4	0.066	0 calm	2 haze Fm
28	9 1/2	29.986	74.1	77.1	70.2	76.1	79.9	76.2	0		2 SW	10 Pm Fm — Rs
29	9 1/2	30.421	69.8	61.4	59.9	60.6	83.4	61.8	0		2 NE	10 Pm
30	9 1/2	30.360	67.0	64.7	57.1	64.0	64.0	64.1	0		1 S	10 Pm
	9.6	783.758 30.145 .106 30.039	1769.4 68.1	1736.9 66.8	1555.3 59.8	1717.3 66.0	1901.5 73.1	Max. set inside building	32 3/4	2.889 Rainfall for month 2.89 inches.	41 1.6	185 7.1

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September 1881.

Date	Time P.M.	Barometer	Attached thermometer	No. 4	Wind	Clouds	Time P.M.	Zodiacal light	Time P.M.	Aurora	Reduced to Signal Service
1											Obsc.
2											Obsc.
3											Obsc.
4											Obsc.
5											Obsc.
6											Obsc.
7	9¼	29.995	82.4	81.7	0 calm	1 haze	9¼	Moonlight & haze	9¼	Moonlight & haze	None
8	9¼	30.218	70.9	60.6	1 SE	1 haze R.s	9¼	Moonlight & haze	9¼	Moonlight & haze	None
9											Obsc.
10											Obsc.
11											Obsc.
12	9	30.010	65.0	58.6	0 E	4 haze Fm	9	Haze	9	Moonlight and haze	Aurora
13	10½	30.125	69.0	58.9	1 W	1 haze Fm	10½	Moonlight & haze	10½	Moonlight and haze	None
14											Obsc.
15											Blank
16											Blank
17	10½	30.378	63.2	62.6*	1 E	0 (Clear)	~~10½~~		10½	0	None
18											Blank
19											Blank
20										~~0 See page 14~~	Blank
21											Blank
22											Blank
23											Obsc.
24											Obsc.
25											Blank
26	9½	30.056	77.8	74.3	1 SE	7 Pm Fm	8½	Hazy Sched.	9½	None	None
27											Obsc.
28	9½	30.108	77.4	72.4	1 NW	4 P Rs	9½	Cloudy	9½	None	None
29											Obsc.
30	11	30.238	72.4	68.2	1 S	0 haze	11	None	11	Low, faint, irregular	Aurora

*Meridian circle record Sept. 17, 1881 makes it likely that the external temperature was 52.6

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September 1881.

1, 10¾ P.M. Day hot, with thick haze, increasing; evening wholly overcast.

1, 9½ A.M. Yesterday cloudy with northeast wind; thunder shower beginning about 11¾ A.M.; afternoon and following night rainy.

4, 9½ A.M. Yesterday cloudy day and evening, with a little rain.

5, 9¾ A.M. Yesterday cloudy day and evening.

6, 9½ A.M. Yesterday cloudy day and evening; a few drops of rain.

6, 4 P.M. Day calm, very dark, sky strongly yellow, so that the light from gas or candles is at least as much white than the daylight as it usually is yellower. From 3½ to 3¾ P.M. tried following experiment in large dome: closed window shutters, and opened lowest section of dome shutters 2 inches; turned opening to the north; set up a piece of paper with an oiled spot upon it against the opening; a candle, wick 0¾ inches high, held inside dome on a level with the paper and 15 inches from it brings the illumination of the oiled spot about to equality with the rest of the paper; (various trials give 14 to 16½ inches with an average of about 15). The same candle and paper may be used on an ordinary cloudy day to repeat the experiment.

7, 9¾ A.M. The yellow light of yesterday disappeared gradually after 4 P.M., and was not noticeable at 6 P.M.; the clouds gradually became thinner during the evening; at 10 P.M. the principal stars were visible, but there was still much haze; no aurora seen.

7, 2 P.M. No. 4 93.2°.

7, 9½ P.M. Day hot rather clear, with a little hazy; evening a little hazy; no aurora seen.

9, 9½ A.M. Yesterday clear with east wind; evening nearly [illegible]

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10, 10 A.M. Yesterday cloudy day and evening; a few drops of rain about 6 P.M.

11, 9½ A.M. Yesterday cloudy day and evening; with a little rain.

12, 9½ A.M. Yesterday cloudy day and evening, with some mist and rain.

12, 2 P.M. About 1¾ P.M. repeated experiment of Sept. 6 with same candle and paper; other conditions also all the same; distance of candle now had to be reduced to 1 inch. Day cloudy and rather dark.

12, 3½ P.M. Sky still entirely overcast, but not as dark as at 2 P.M. Experiment repeated; result ½ inches or less.

12, 4½ P.M. During the past half hour experimented for the difference in brightness between the oiled spot and the rest of the paper. For this purpose, tried Photometer R, removing the eye-piece, and leaving only the Nicol and double image prism. Set the paper in the slit 2 inches wide as before, turned to the north; sun coming out and clouds disappearing, but still a good deal of haze in the north, and no disturbance from any direct sunlight. The oiled spot nearly filled the slit, and the two images were set so that one should be above the other. The comparisons were made between the oiled spot of one image and the rest of the paper in the other, taking care not to have the parts compared at all in the overlapping portion of the two images. After making four comparisons of two readings each reversed the images and took four more

	1 and 2		3 and 4		5 and 6		7 and 8		Mean of 8 differences
Lower image faint	241.0	31.2	319.1	42.1	51.0	39.7	226.0	43.0	$\frac{324.5}{8} = 40.58$
	172.2		361.2		90.7		269.0		
Upper image faint	229.0	40.2	47.0	44.2	135.0	44.3	313.8	39.8	$\frac{1}{2}$ diff. = 20.29
	269.2		91.2		179.3		353.6		9.5079
									9.1358
									0.8642
									7.3

Power of slit about 7.3 times as bright as oiled paper.

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September, 1881

12, 6 P.M. To form some idea of the effect produced by reflected candle-light on the paper, pinned a strip of it containing the oiled spot on a black cloth, and made comparisons with Photometer R as before in the alcove of the dome with the shutters closed between the oiled spot and the paper. A set of eight comparisons as before were made with the candle at 13 inches from the paper and then a set of four with the candle 6½ inches from the paper. These last were more troublesome, and the results not so likely to be correct; they were taken to see whether there would be so great a difference in the results as to show that not even an approximate conclusion could be reached.

Distance of candle 13 inches.

	1 and 2		3 and 4		5 and 6		7 and 8	
Lower image faint	7.2 78.5	71.3	191.0 253.2	62.2	12.2 62.0	49.8	174.1 240.7	66.6
Upper image faint	93.5 168.5	75.0	271.2 346.2	75.0	87.0 148.0	61.0	269.0 326.0	57.0

Distance of candle 6½ inches.

	9 and 10		11 and 12	
Lower image faint	3.0 54.5	51.5	180.0 239.2	59.2
Upper image faint	91.0 151.2	60.2	273.3 348.8	45.5

Mean
$\frac{517.9}{8} = 64.74$

Mean of all
$\frac{734.3}{12} = 61.2$
½ diff. 30.60
9.7719
9.5438
6.4562
2.86

Mean
$\frac{216.4}{4} = 54.10$

If the mean of all the comparisons is taken, so as to give most weight to the result obtained with the candle at the greater distance, the paper is according by about 3 times as bright as the oiled spot by the reflected light of the candle.

12, 7 P.M. If we may assume that the accordance of these measurements is sufficient to warrant us in taking the respective ratios of brightness of the oiled spot and the rest of the paper as constant it would not be necessary to consider these ratios, as they would be eliminated in the result. In order to check

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the first measurement, however, a comparison was made by transmitted gas light in the alcove of the dome with a background of black cloth, the curtain of the alcove cutting off the direct view of the gas light from the observer and the paper being pinned to the edge of the curtain.

Upper image faint.	19.5 72.2	52.7	200.5 256.8	56.3	Mean $\frac{226.0}{4} = 56.5$
Lower image faint.	110.0 168.0	58.0	291.0 350.0	59.0	$\frac{1}{2}$ diff. 28.25 9.7297 9.4594 0.5406 3.47

Hence oiled spot only 3.5 times as bright as rest of paper, instead of 7 times as by daylight transmitted. Now on Sept. 6 the light was the gaslight as gaslight is to ordinary daylight, and accordingly the ratio of the transmitted light at the oiled spot to that at the rest of the paper may have been below 2; probably not much below, since the difference then was decided.

Let c_1 denote the quantity of light received on a unit of surface from the candle at the distance of 1 inch, and mc_1 and nc_1 the fractions of this quantity reflected respectively from the oiled spot and from the rest of the paper; let d_1 denote the respective distances of the candle in inches. Let l_1 denote the quantity of light received on a unit of surface from the sky, and $p_1 l_1$ and $q_1 l_1$ the fractions of this quantity respectively transmitted by the oiled spot and by the rest of the paper on the first of the two dates; let l_2, $p_2 l_2$, and $q_2 l_2$ have the corresponding meanings for the second date. Then by the equations (1) and (2) above,

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September 1881.

$$\frac{mc}{d_1^2} + p_1 l_1 = \frac{nc}{d_1^2} + q_1 l_1 \quad \text{and}$$

$$\frac{mc}{d_2^2} + p_2 l_2 = \frac{nc}{d_2^2} + q_2 l_2 .$$

$$\frac{m-n}{d_1^2} c = (q_1 - p_1) l_1 \; ; \quad \frac{m-n}{d_2^2} c = (q_2 - p_2) l_2$$

$$\frac{d_1^2}{d_2^2} = \frac{(q_2 - p_2) l_2}{(q_1 - p_1) l_1} \; ; \quad \frac{l_2}{l_1} = \frac{(q_1 - p_1) d_1^2}{(q_2 - p_2) d_2^2} = \frac{(p_1 - q_1) d_1^2}{(p_2 - q_2) d_2^2}$$

If $p_1 = p_2$, and if $q_1 = q_2$, the observations accordingly give the ratio $\frac{l_2}{l_1} = 0$. In the present case, they probably do not. We may assume for Sept. 6 $p_1 = 2q_1$, and for Sept. 12 $p_2 = 7q_2$; then $\frac{l_2}{l_1} = \frac{225 q_1}{6 q_2}$, and $\frac{q_2 l_2}{q_1 l_1} = 38$; if we then suppose that q^2 the inner surface of the paper had the same relation of brightness to the sky on both dates, the light of Sept. 6 was only $\frac{1}{40}$ of that of Sept. 12; but probably a further reduction may be required. It would apparently be safe to say that Sept. 12 must have been ten times as bright as Sept. 6.

12, 7 P.M. Day cloudy with rain, partly clearing off about 5 P.M.; later [illegible] between 8 P.M. and 8½ P.M.

Observations by W. H. Pickering at Intervale, N. H.

Sept. 14, 81.
Observed Arcturus and Vega on the 12th. Pan each + nearly in the meridian. Seen with 3°-5°. Seen with 6° when culminating. Vega culminating about 8h 15m. Arcturus culminating about 8h 45m.

N ↑ S

Sept. 13, 81. Observed Arcturus and Vega when about 3° high. Seen with 6° when culminating. Vega culminating about 8h 15m. Arcturus culminating about 8h 45m.

P.S. Observed with the smaller eyepiece at 8h 23 reached Arcturus, Vega, α Lyrae, α Draconis, α Bootis, ε Bootis, ζ Bootis, ε Ursæ Majoris, ζ Ursæ Majoris, α Ursæ Majoris, β Ursæ Majoris, γ Ursæ Majoris, δ Ursæ Majoris, ε Ursæ Majoris, ζ Ursæ Majoris, η Ursæ Majoris, α Ursæ Majoris, β Ursæ Majoris, γ Ursæ Majoris, δ Ursæ Majoris, ε Ursæ Majoris, ζ Ursæ Majoris, η Ursæ Majoris.

W. H. P.

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September 1881.

$$\frac{mc}{d_1^2} + p_1 l_1 = \frac{nc}{d_1^2} + q_1 l_1 \quad \text{and}$$

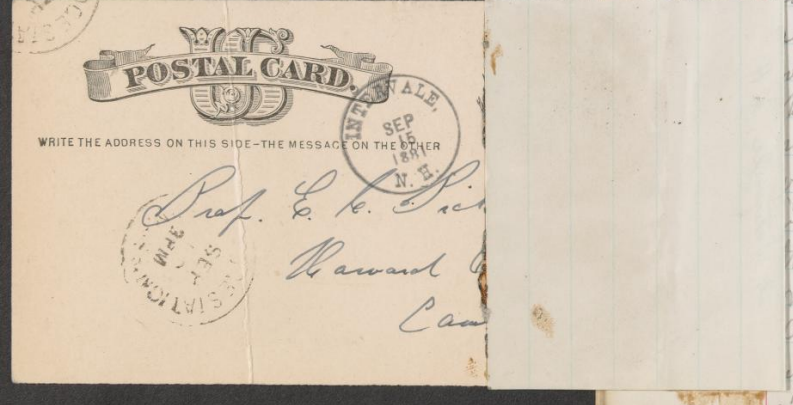
$$\frac{mc}{d_2^2} + p_2 l_2 = \frac{nc}{d_2^2} + q_2 l_2 .$$

$$\frac{m-n}{d_1^2} c = (q_1 - p_1) l_1 \; ; \quad \frac{m-n}{d_2^2} c = (q_2 - p_2) l_2$$

$$\frac{d_1^2}{d_2^2} = \frac{(q_2 - p_2) l_2}{(q_1 - p_1) l_1} \; ; \quad \frac{l_2}{l_1} = \frac{(q_1 - p_1) d_1^2}{(q_2 - p_2) d_2^2} = \frac{(p_1 - q_1) d_1^2}{(p_2 - q_2) d_2^2}$$

If $p_1 = p_2$, and if $q_1 = q_2$, the observations accordingly give the ratio $\frac{l_2}{l_1} = 1$. In the present case, they probably do not. We may assume for Sept. 6 $p_1 = 2 q_1$, and for Sept. 12. $p_2 = 7 q_2$; then $\frac{l_2}{l_1} = \frac{225 q_1}{6 q_2}$, and $\frac{q_2}{q_1} \frac{l_2}{l_1} = 38$; if we then suppose that q_2 the inner surface of the paper had the same relation of brightness to the sky on both dates, the light of Sept. 6 was only $\frac{1}{40}$ of that of Sept. 12; but probably a farther reduction may be required. It would apparently be safe to say that Sept. 12 must have been ten times as bright as Sept. 6.

12, 7 P.M. Day cloudy with rain, partly clearing off about 5 P.M.; hazy later; some clouds snow; between 8 P.M. and 8¾ P.M. a narrow bright streak from west to east, evidently polly or in part auroral; at 8½ P.M. it was bright, considerably dimming the stars over which it passed; it passed through the head of Boötes, afterwards curving somewhat irregularly to the south and then towards the east; the spectrum, so far as could be made out by E.C.P. and A.S. was continuous; it faded rather rapidly, breaking up into transverse bands in places, which had a rapid motion westwards, of a decidedly



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auroral character; nothing was left of it at 9 P.M.; no aurora was seen in the north.

12, 10 P.M. Clouds increasing; no aurora seen.

13, 10½ P.M. Day clear, warm; clouds rising in the west about 6 P.M., hinging on a thunder shower; clear again about 7½ P.M.; evening mostly clear, with some haze and passing clouds; no aurora seen.

15, 9½ A.M. Yesterday clear at first, becoming cloudy with east wind; evening cloudy.

15, 10¾ A.M. Att. therm: 66.6; 30.423; A.S. obs.; 30.430; J.R.E. obs. 30.426, A.S. obs; att. therm. 67.0 at last reading; 30.430, J.R.E. obs. 30.430, A.S. obs without moving the cistern index.

16, 9¾ A.M. J. Rayner Edmands obser.

20, 9½ A.M. There was a slight mist yesterday morning, and a few drops of rain for (ray) 5 minutes, but not weighable at gauge. B.R.E.

Aurora evening of Sept. 20. See book of equatorial records (R 98).

22, 9½ A.M. Heavy dews in last two nights. Caused accumulation of a few drops of water in gauge. (this water allowed to remain)

23, 10 A.M. A few drops of rain at 2h 15m A.M. No measurable amount found in the gauge.

24, 9½ A.M. Last night a thunder shower (about) 7½ to 8¾ P.M.

Another with heavy rainfall about 10½ to 11 P.M.

25 9¾ am Yesterday cloudy afternoon and evening until 11 P.M., after which no obs until this morning. S.C.C.

	Minimum	Relative			Range	Rainfall	Wind, Hours
26 11½ A.M. Baron. Att. Therm. No 4.	Before	After	Before	After		in inches	
J.R.E. obsr.	30.033	75.6	81.4	67.6	60.4	82.0	60.4	0		18 W. 6R

26, 9½ P.M. Evening sultry, at first rather clear; clouds coming on from the west, with frequent lightning.

27, 9¾ A.M. Thunder shower about 10 P.M. yesterday.

28, 9½ A.M. Yesterday clear at first, rather hot; evening mostly

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September, 1881.

28, 9½ P.M. Day rather hot and partly clear; evening mostly cloudy, with lightning in the south; now rather clear to the north; no aurora seen.

W. Hoxie sends account of hurricane on the Coast of South Carolina, for which see his letter of Sept. 5, on file with Observatory letters.

30, 9½ A.M. Yesterday cool with east wind, partly clear; cloudy towards night and during the evening and night.

30, 11 A.M. During a visit to the White Mountain region, Sept. 15 to 25 inclusive, A. Searle looked on favorable occasions for Gegenschein, without detecting any; but the sky was never very clear. On one occasion waited till near midnight for an observation without success. On several evenings the sky was sufficiently clear to allow the band from Aquila to the Pleiades to be traced as far as 27 Piscium. On Sept. 17, from the summit of Mount Washington, Mr. W. H. Pickering made out the beginning of the band without the aid of suggestions as to its course, and with that aid, thought he could trace it into Aquarius.

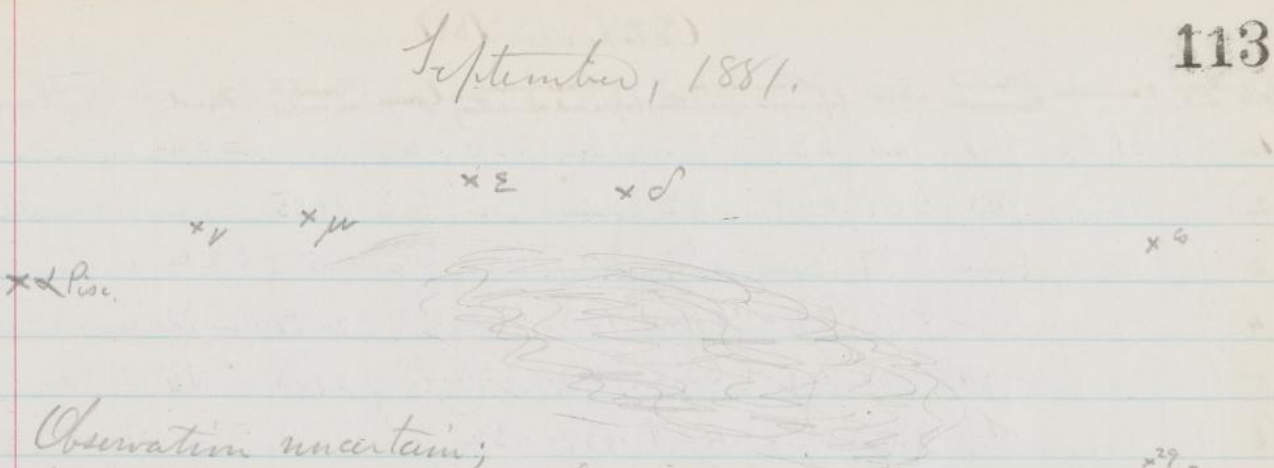
The region of Gegenschein is now coming so close to Saturn and Jupiter that it is unlikely that the occurrence of the phenomenon can be verified this season on the preceding side of the Milky Way.

30, 11 P.M. Day at first cloudy and cool, afterwards growing warmer and clearer; passing clouds early in the evening; now nearly clear, with slight haze. Band of light from Aquila to the Pleiades traceable throughout its course but Jupiter somewhat interferes with observation near Pleiades. Gegenschein somewhat suspected as an intensification of the band between 27 Piscium and [illegible] Piscium [illegible]

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September, 1881.



Observation uncertain;
Gegenschein expected by observer
farther east, if at all, than this appearance.
Low faint irregular aurora.

Place of suspected Gegenschein Sept. 30, 1881, $0^h\ 40^m$, $+1°$.
Place of Sun $12^h\ 30^m$, $-3°$.

Report to Signal Service, sent Oct. 1, 1881.

Aurora — regularly looked for on clear evenings; but no observations recorded Sept. 15, 16, 18, 19, 20, 21, 22, 25. On Sept. 12, between 8 P.M. and 8¾ P.M., a narrow bright streak from west to east, evidently wholly or in part auroral; at 8½ P.M. it was bright, considerably dimming the stars over which it passed; it crossed the head of Bootes, afterwards curving somewhat irregularly to the south and then towards the east; its spectrum appeared to be continuous; it faded rather rapidly, breaking up into transverse bands in some places; these bands had a rapid motion westwards, of a decidedly auroral character; nothing was left of it at 9 P.M.; no aurora was seen in the north. About 11 P.M., Sept. 30, a low, faint, irregular aurora was visible in the north.

Zodiacal light — not seen during the month; evenings generally unfavorable to observation.

Thunder showers — Sept. 2, thunder shower beginning about 11¾ A.M.; Sept. 13, clouds rising in the west about 6 P.M., bringing on a thunder shower; Sept. 23, thunder shower 7½ to 8¼ P.M., approximately, and another about 10¼ to 11 P.M.; Sept. 26, thunder shower about 10 P.M., with frequent lightning earlier from clouds coming on from the west; Sept. 28, lightning in the south during the evening.

Unusual clouds. — On Sept. 6 the sky was wholly overcast and strongly yellow, so that the light from gas or candles was at least as much whiter than the daylight as it usually is yellower. The day was unusually dark; from some imperfect experiments it would seem that certainly not more than one tenth as much light was received from the sky as on an average cloudy day. The yellow light was most remarkable during the afternoon, but disappeared gradually after 4 P.M., and was not noticeable at 6 P.M.; the clouds gradually became thinner during the evening, at 10 P.M. the [illegible]

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October 1881.

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	9½	30.196	70.3	74.0	63.9	73.0	76.8	73.9	0		2 SW	0 Rs	1
2	9½	30.549	70.1	62.8	60.0	62.2	82.8	63.0	0 5/8	0.055	2 NE	10 Pm Fm —	2
3	9¼	30.049	66.0	63.7	57.5	63.0	63.9	63.0	6 1/4	0.552	1 SE	10 Pm; fog and rain	3
4	9½	29.789	68.2	68.8	59.8	68.0	72.3	68.2	0 5/8	0.055	2 W	2 M Fm	4
5	10¼	30.036	43.0	36.3	29.5	35.8	70.2	37.0	0 3/8	0.033	3 NW	0 Fm	5
6	9½	30.272	43.0	43.5	29.8	42.7	43.2	43.2	0		2 W	2 Pm Fm	6
7	9¾	30.328	53.8	55.3	40.2	54.7	57.6	55.0	0		1 W	0 Fm	7
8	9½	30.173	60.0	65.5	54.1	64.2	66.3	64.1	0		1 SW	10 Pm Fm —	8
9	9½	29.976	64.0	64.2	61.7	63.3	74.0	63.6	0 1/4	0.022	2 N	2 Pm Ra Fm	9
10	10	30.002	59.2	59.2	47.8	58.3	70.0	58.4	0		2 NW	0 M	10
11	9½	30.545	45.3	40.1	31.3	39.1	62.0	40.1	0		1 NE	0 Fm	11
12	10¼	30.358	49.8	52.7	31.2	51.2	51.7	51.7	0		2 SW	10 P Fm /	12
13	9¾	30.069	58.3	64.2	51.2	63.1	63.2	63.0	0		2 SW	8 Pm M Fm —	13
14	9½	30.366	52.0	42.4	38.1	41.7	74.3	43.3	3 1/4	0.287	2 N.	0	14
15	9¼	30.291	52.8	50.3	37.1	49.5	50.0	50.2	0		1 S.	10 Pm	15
16	9½	30.121	61.9	70.3	49.3	69.5	69.6	69.2	0		1 W	5 Pm Fm —	16
17	9¼	30.417	57.2	52.8	47.2	52.1	72.8	53.2	0		2 E.	10 P	17
18	9½	29.858	57.2	51.4	50.7	50.7	53.9	51.9	0 1/4	0.022	2 NE	10 P fog	18
19	9½	30.135	49.9	46.2	39.5	45.2	53.0	46.3	2 3/8	0.210	3 N	4 P M Rs Fm — Fm	19
20	9¾	30.218	50.6	44.1	37.5	43.6	50.3	44.7	0		1 N	10 P	20
21	9¼	30.270	47.8	40.0	32.1	39.9	51.2	40.8	0		1 N	1 fog	21
22	9¼	30.358	50.8	46.7	38.2	46.6	54.9	47.2	0 1/8	0.011	1 W	0 Rs	22
23	9½	30.120	56.0	55.7	46.3	54.8	62.4	55.2	0		1 W	9 P Fm —	23
24	9½	29.886	57.7	54.6	51.2	53.8	66.3	54.5	0		2 NE	10 Pm Fm —	24
25	9½	29.492	51.0	44.9	39.0	44.3	54.6	45.0	0 5/8	0.033	1 N	10 Pm	25
26	9½	29.714	44.9	40.0	37.8	39.3	58.0	40.2	0		3 NW	2 M Fm —	26
27	9½	30.042	39.0	36.7	26.0	36.1	40.4	36.8	0		2 NW	0 Rs	27
28	9½	30.200	44.0	45.3	31.8	44.4	51.0	45.0	0		2 NW	1 P Rs R	28
29	9½	30.312	46.7	43.0	33.1	42.7	53.6	43.0	0		1 N	10 P Fm	29
30	9½	29.987	54.0	56.8	42.1	56.0	59.5	56.3	3	0.265	1 N	10 P mist	30
31	9¼	29.850	58.0	59.7	53.0	58.1	63.0	58.2	4 5/8	0.408	1 N	10 Pm raining	31
	9.5	933.971 / 30.128	682.5 / 54.3	1630.1 / 52.6	1348.0 / 43.5	1606.4 / 51.8	1892.8 / 61.0	Max. at inside bulb	22 3/8	1.975 Rainfall for month	51	166 / 5.4	

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October 1880

Date	Time P.M.	Barometer	Attached thermometer	No. 4	Wind	Clouds	Time P.M.	Zodiacal light	Time P.M.	Aurora	Report of Signal Service
1											Obsc.
2											Obsc.
3	11	29.921	70.8	65.8	1 SW	0	11	Moonlight	11	Moonlight	None
4	9	29.808	65.0	49.3	3 NW	5 Pm 7m →	9	Cloudy	9	None	None
5	9¼	30.218	48.9	35.9	1 W	0	9¼	Moonlight	9¼	Moonlight	None
6	9	30.248	56.1	49.1	1 SW	0	9	Moonlight	9	Moonlight	None
7	9¼	30.274	61.8	56.1	2 SW	9 Pm 7m →	8	Moonlight	8	Moonlight	None
8											Obsc.
9											None
10	10½	30.355	57.3	41.6	2 NW	0	10½	Moonlight	10½	Moonlight	None
11	9¾	30.500	52.4	35.8	1 SE	0	7	Slightly suspected	9¾	Moonlight	None
12											Obsc.
13	9	29.927	66.7	68.7	1 S	10 Pm	9	Cloudy	9	Cloudy	None
14	10¼	30.350	54.3	37.9	1 SE	3 Pm	8¼	Suspected	8¼	None	None
15	9	30.033	59.5	59.3	3 S	1 Pm haze	8¼	Hazy	8¼	Hazy	None
16	8½	30.350	64.1	56.7	1 N	9 Pm	8½	Cloudy	8½	Cloudy	Aurora
17											Obsc.
18											None
19	8¾	30.245	53.7	40.6	1 NE	8 P	8¾	Cloudy	8¾	Cloudy	None
20	11	30.154	51.8	36.5	1 W	4 fog	11	Foggy	11	Foggy	None
21	8½	30.264	55.1	45.2	1 SE	5 P Rs haze	8½	Cloudy	8½	None; dense clouds	None
22											Obsc.
23											Obsc.
24											Obsc.
25											None
26	9¾	29.960	40.0	29.4	0 calm	0	9½	Suspected	9¾	None	None
27	9¾	30.090	49.0	40.5	0 calm	0 Rs	8	Moonlight	9¾	Slightly suspected	Aurora
28	10¾	30.280	50.7	40.1	0 calm	3 haze	8½	Cloudy	10¾	None	None
29											Obsc.
30											Obsc.
31											Obsc.

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October, 1881.

2, 9½ A.M. Yesterday warm, clear at first, clouds increasing towards night; evening mostly cloudy; no aurora seen.

3, 9¼ A.M. Yesterday cloudy day and evening, with rain towards night

3, 11 P.M. Day warm, at first rainy; afternoon rather clear; evening clear; no aurora seen.

5, 12½ A.M. ~~Yesterday~~ clear and warm at first, soon cloudy with a few drops of rain at times; evening cool, cloudy except in the north till 10 P.M., then mostly clear till about midnight; now partly cloudy; no aurora seen.

5, 2 P.M. External thermometer No. 4 43.2.

5, 11 P.M. Day cold and windy, with passing clouds; evening clear, with little wind; no aurora seen.

6, 10½ P.M. Day clear, cool; evening clear, with a few thin clouds; no aurora seen.

7, 9¼ P.M. Day mostly clear, warm; evening clear at first; clouds came on about 8½ P.M.; no aurora seen.

9, 9¼ A.M. Yesterday warm; mostly cloudy; evening cloudy with a little rain.

10, 10 A.M. Yesterday rather clear and warm; cloudy towards night and most of the evening; nearly clear after 10 P.M.; no aurora seen.

10, 10½ P.M. Day cool, rather cloudy, clearing off cloudy after sunset; clear after 9 P.M.; no aurora seen.

11, 9¾ P.M. Day cool, clear; evening clear; no aurora seen.

13, 9¾ A.M. Yesterday mostly cloudy and rather warm; evening cloudy.

13, 9 P.M. Day warm and rather cloudy; evening partly clear about 8 P.M., now wholly cloudy; no aurora seen.

14, 10¼ P.M. Day clear, cool; evening clear, now growing somewhat cloudy; no aurora seen.

15, 9¾ P.M. Day cloudy, warm; evening clear, somewhat hazy; clouds came on about 9½ P.M.; no aurora seen.

16, 10¼ P.M. Day warm, with frequent clouds; evening partly clear; aurora since 9¾ P.M. or earlier; diffused light below and among little clouds, with bright streamers;

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little or no dark sky below aurora.

16, 10 5/12 P.M. Arch now formed, ~~little~~ Brs. Maj. in middle of arch from above to below; dark sky beneath, interrupted by streamers.

18, 9½ A.M. Yesterday cloudy, day and evening.

19, 9½ A.M. Yesterday cloudy with some rain, clearing late in the evening; no aurora seen about 11½ P.M.

19, 8¾ P.M. Day cool, clear at first; rather cloudy towards night; evening rather cloudy, pretty clear for a time about 7 to 8 P.M.; no aurora seen.

20, 9¾ A.M. Yesterday evening almost wholly cloudy about 10½ P.M.

20, 11 P.M. Day at first rather cloudy and cool, becoming clearer; evening nearly clear, now rather foggy; no aurora seen.

22, 9¼ A.M. Yesterday mostly rather clear and cool; evening somewhat cloudy; no aurora seen.

23, 9¼ A.M. Yesterday warm, rather clear; evening cloudy.

24, 9½ A.M. Yesterday warm, rather cloudy; evening cloudy.

25, 9¼ A.M. Yesterday cloudy and chilly day and evening, with a little rain.

26, 9½ A.M. Yesterday cloudy, clearer towards night; evening generally cloudy; clear at times; clear at 10½ P.M.; no aurora seen.

26, 11 P.M. Day clear, rather cold; evening clear; no aurora seen; Thermometer Natl now 29.3.

27, 12 P.M. Day and evening clear, cool; aurora occasionally suspected, now pretty certain; some appearance of streamers.

28, 11 P.M. Day cool, mostly clear; somewhat cloudy towards night; evening at first rather cloudy; clouds afterwards diminishing, haze increasing; no aurora seen.

30, 9½ A.M. Yesterday cloudy day and evening, with a little rain.

31, 9¼ A.M. Yesterday cloudy day and evening, with mist and fog at times.

Nov. 1, 9½ A.M. Yesterday cloudy day and evening, with occasional

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October, 1881.

Report to Signal Service, sent Nov. 1, 1881.

Aurora regularly looked for on clear evenings; Oct. 16, aurora 9¾ P.M. or earlier; at 10¼ P.M., diffused light below and among little clouds, with some streamers; little or no dark sky below aurora; at 10h 25m P.M. arch formed, (Gamma) Ursæ Maj. half way between upper and lower edges of arch; dark sky beneath, interrupted by streamers. Oct. 27, aurora occasionally suspected during the evening, pretty certain at midnight; some appearance of streamers.

Zodiacal light. suspected Oct. 11, 14, 26; observations on other evenings hindered by moonlight, clouds, or haze.

Frost, rather severe, nights following Oct. 4 and 5; minima respectively 29.5 and 29.8. Minimum also below the freezing point on the nights following Oct. 10, 11, 26, 27.

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November, 1881.

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
1	9½	30.043	56.6	53.6	51.0	52.5	60.0	53.6	10 5/8	0.938	2 NE	10 Rn; a little rain
2	9¾	30.126	54.0	49.4	48.1	48.7	54.3	49.6	0 1/4	0.022	2 NE	10 Rn; fine rain
3	9½	29.774	54.3	55.7	48.3	52.9	55.0	52.8	0 3/4	0.066	0 calm	10 P fog
4	9½	29.354	53.2	41.9	40.3	41.2	65.0	42.7	7	0.618	1 NW	10 Rn; raining
5	9¼	30.117	46.6	36.6	30.7	36.0	45.5	37.6	0 1/4	0.022	1 W	0
6	9½	30.146	53.0	54.0	35.8	53.3	53.9	53.9	0		2 SW	0 haze
7	9½	30.511	42.0	41.3	33.0	40.3	58.0	41.0	0		2 N	10 P
8	9¼	30.398	50.3	49.7	40.2	48.8	49.3	49.3	0		1 E	10 Rn; a little fine rain
9	9¾	30.068	52.8	62.0	48.7	60.0	61.0	57.3	1 1/4	0.110	2 S	10 Rn fm
10	9½	30.199	49.5	46.3	41.0	45.2	68.0	46.2	2 1/4	0.199	1 W	6 Rn fm →
11	#	~~30.268~~	~~40.3~~									
12	#9½	30.196	43.0	33.9	29.3	33.5	40.0	34.4	0 1/8	0.011	1 NE	10 P
13	10	29.649	45.8	42.9	33.3	42.2	45.5	43.0	5 1/8	0.452	1 SW	0 Rs fm haze
14	9¾	29.947	46.0	44.4	36.8	43.3	53.2	44.3	0		2 W	0 M
15									See p. 123	0.044		
16	10½	30.573	38.3	36.8	29.4	36.2	40.5	36.7	0		1 W	1 Rs fm
17	9¾	30.521	42.2	39.7	32.6	39.3	42.9	40.0	0		1 S	1 P Rs
18	9¾	29.923	51.0	58.0	39.3	57.0	57.3	56.7	0		3 SW	10 Rn fm
19	9¼	29.854	50.1	40.7	40.0	40.0	60.0	41.1	See p. 123	0.783	2 NE	10 Rn; raining
20	10	30.153	39.4	35.8	33.3	35.0	42.0	35.8	11 1/4	0.993	3 W	0 M fm
21	9¾	30.309	39.2	35.0	24.8	34.3	37.0	35.2	0		1 S	9 R Rn fm →
22	9¼	30.161	43.0	33.5	33.1	33.1	45.2	34.0	0		2 N	6 P Rs fm →
23	9½	30.288	30.6	20.2	13.2	19.7	34.2	21.0	0		1 N	10 P
24	10¼	29.558	37.0	32.8	19.7	32.4	34.2	33.5	See p. 124	0.349	1 NW	10 Rn
25	9¼	30.084	33.1	21.8	18.5	21.1	38.3	23.0	0		2 W	0
26	10	30.088	34.8	35.7	19.8	34.9	35.1	35.2	0		2 SW	1 P Rs
27	9½	29.998	38.0	36.7	30.7	35.6	42.5	36.4	0		1 SW	3 Rn
28	9½	30.389	26.5	16.9	15.3	16.1	43.7	17.5	0		2 N	0 Rs
29	9½	30.328	33.3	37.2	16.0	36.3	36.7	36.7	0		2 SW	0 Rs
30	10	30.113	42.1	43.7	36.2	43.0	48.0	43.7	0		0 calm	5 P Rs
	9.6	842.869 30.102 30.041 30.061	1225.7 43.8	1136.2 40.6	918.4 32.8	1113.9 39.8	1346.3 48.1	Max. set inside building.	See pp. 123, 124	4.607 Rainfall for month 4.61 inches	42. 1.5	153. 5.5

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November 1881.

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											Obs.
2											Obs.
3											Obs.
4	10	29.716	49.9	36.8	1 SW	0 Rs	8½	Moonlight	10	Moonlight	None
5											Obs.
6	10	30.378	51.6	40.9	0 W	0	8¼	Moonlight	10	Moonlight	None
7											Obs.
8											Obs.
9											Obs.
10	11½	30.281	49.2	38.9	2 NW	6 Pm 7m			11½	Moonlight	None
11	8¾	30.349	44.1	32.6	1 W	1 haze	7½	Visible	8¾	None	None
12											Obs.
13											Obs.
14	9¼	30.056	45.0	38.4	0 calm	0	7¼	Visible	9½	None	None
15	9¾	30.394	39.3	34.3	2 W	0	7	Visible	9¼	None	None
16	9	30.536	42.9	37.7	0 W	10 Pa few stars	7	Cloudy	9	Cloudy	Obs.
17											Obs.
18											Obs.
19											Obs.
20	9¾	30.417	36.0	27.9	1 S	0	7	Distinct	9¾	None	None
21	10¾	29.973	45.0	41.3	2 S	10 Pm	10¾	Cloudy	10¾	Cloudy	Obs.
22	9	30.338	26.3	18.7	2 N	3 haze	7½	Visible; haze	9	None	None
23											Obs.
24											Obs.
25	9	30.280	35.7	20.8	0 NW	7 Pa	8¾	Somewhat visible	9	None; rather cloudy	None
26	9¾	30.026	39.9	34.5	2 SW	5 P haze	9¾	Cloudy	9¾	None; rather cloudy	None
27	10¼	29.881	43.8	41.4	2 SW	1 Pm 7m	10¼	Moonlight	10¼	Moonlight and clouds	None
28	8¾	30.490	33.8	20.7	0 SW	0	8¾	Moonlight	8¾	Moonlight	None
29	8¾	30.168	42.8	41.5	2 S	6 Pa Rs	8¾	Moonlight and clouds	8¾	Moonlight and clouds	None
30	9½	30.044	48.1	44.9	1 SW	5 Pa Rs 1	9½	Moonlight and clouds	9½	Moonlight and clouds	None

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November, 1881.

3, 9½ A.M. Yesterday and previous day cloudy day and evening, with a little rain

4, 9½ A.M. Yesterday cloudy day and evening; some rain.

4, 11½ P.M. Day cloudy with some rain; shower from the southwest about 5 3/4 P.M.; clear after 8½ P.M.; no aurora seen.

6, 9½ A.M. Yesterday clear and cool, becoming cloudy towards night; ~~1 P.M.~~ evening cloudy.

6, 11 P.M. Day clear and cool; evening clear, with some thin clouds, no aurora seen.

7, 9½ A.M. Faint halo about the moon at 11 P.M. yesterday.

8, 9¼ A.M. Yesterday cloudy day and evening.

9, 9¾ A.M. Yesterday cloudy day and evening, with a little rain. Slight shower after 7 A.M. today.

10, 9½ A.M. Yesterday cloudy with some rain; evening cloudy, clouds becoming thin and broken after 10 P.M.; no aurora seen.

10, 11½ P.M. Day partly clear, cool; evening partly clear, cloudy frequent; no aurora seen.

11, 4½ A.M. Nearly clear; no aurora seen (moonlight).

11, 11 A.M. Barom. 30.368; attached thmr. 40.3; No. 4, 35.9; minimum 30.0, 35.1; maximum 50.2, 36.7; wind 3 N.W.; clouds 0 Fm.

11, 10 P.M. Day mostly clear, cool; evening rather clear with some clouds, and haze thickening; now rather hazy; zodiacal light pretty certainly visible early in the evening in Capricornus with dark space between its n p edge and the band from Aquila; no aurora seen.

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

14, 9¾ A.M. Yesterday clear at first, then rather cloudy; evening cloudy.

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November, 1881.

15, 2 A.M. Barom. 30.052; attached therm. 45.4; No. 4, 35.3. Yesterday cool, clear at first, then cloudy; clear again towards night; evening clear; no aurora seen; haze and clouds increasing after 11 P.M.; now mostly cloudy.

15, 11 A.M. Barom. 30.038; attached therm. 44.0; No. 4, 37.6; minimum 32.1 before setting, 37.1 after setting; maximum 49.4 before setting, 38.0 after setting; wind 2 W; clouds 10 D; gauge 0½ ounces, 0.044 inches. A little rain and snow early today.

15, 12 P.M. Afternoon and evening clear; no aurora seen. Zodiacal light, and dark space between its north preceding side and the band from Aquila, well seen early in the evening.

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

18, 9¾ A.M. Yesterday somewhat clear at first, afterwards rather cloudy; evening cloudy, some stars visible

19, 9¼ A.M. Yesterday warm and cloudy, with some rain; following night raining.

19, 10¼ A.M. Gauge 8⅞ ounces; 0.783 inches.

20, 3½ A.M. Barom. 29.844; attached therm. 44.9; No. 4, 34.8; wind 2 W; clouds 0; no aurora; Zodiacal light in the east, extending beyond Virgo, and probably nearly to α Leonis, for the body of Leo is a little brighter than usual relatively to the band between Leo and Sextans observed last year; distribution of light in Cancer and Hydra as last season.

20, 10 A.M. Yesterday cloudy with rain; clearing off about 1 A.M. Today

20, 10½ P.M. Day cool and clear; evening clear, with a little haze and some clouds after 10 P.M.; no aurora seen; Zodiacal light distinct early in the evening, with dark space between its n p side and band from Aquila as usual; center as high as β Capricorni.

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November, 1881.

2, 10¾ P.M. Day cool, cloudy; clouds thin, thicker in the evening.

2, 6 A.M. Barometer 29.992; attached therm. 44.7; No. 4, 384. Somewhat clear about 5 A.M., cloudy again now.

22, 10½ P.M. Day clear, cold; evening mostly clear; some haze; no aurora seen.

24, 10¼ A.M. Yesterday cloudy with snow after 5 P.M. Snow this morning 2½ inches deep; 15 inches in cylinder 1⅞ inches across weigh 5⅛ ounces; hence rainfall to 1 inch of snow 0.2199 inches; total rainfall 0.550 inches. Gauge 3⅜ ounces, 0.298 inches. There was little wind, so that the gauge is more trustworthy than usual; and there was a crust on the snow, too much of which must have been collected relatively to the rest in the cylinder, as in breaking through it the snow below was disturbed. The mean of the two methods, with double weight to the gauge, is 0.3419 inches, which may be adopted as the rainfall.

25, 9½ A.M. Yesterday cloudy at first, afterwards clear; evening somewhat cloudy, clear early and late.

26, 10 A.M. Yesterday clear and cold; evening clear at first with thin clouds after 9 P.M.; ~~thin clouds~~ no aurora seen; Zodiacal light somewhat visible at 8¾ P.M., and in the east at 4½ A.M. today, when the sky was rather clear.

26, 9¾ P.M. Day rather clear, cool; evening rather clear, with frequent thin clouds; no aurora seen.

27, 10½ P.M. Day rather cloudy, cool; evening partly clear, clouds frequent; no aurora seen.

28, 11½ P.M. Day and evening clear and cold; no aurora seen.

29, 9 P.M. Day clear, cool; thin clouds after 7 P.M.; no aurora seen; strong lunar corona, very distinct about 8½ P.M. when a reddish ring about a degree in diameter encircled the moon with a bright

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within and a bluish strip 20′ to 25′ wide outside it, pretty well defined.

30, 10 P.M. Day warm, mostly clear; thin clouds more or less all the evening, with occasional fragmentary lunar halos; no aurora seen.

Report to Signal Service, sent Dec. 1, 1881.

Aurora regularly looked for on clear evenings; none seen.

Zodiacal light visible Nov. 11, 14, 15, 20, 22, 25; also mornings of Nov. 20 and 26; these were all the occasions during the month when circumstances were favorable to the observation.

Lunar halos Nov. 6, 11 P.M.; faint lunar halo; Nov. 30, occasional fragmentary lunar halos.

Lunar corona Nov. 29, 8½ P.M. Lunar corona, unusually bright and distinct; narrow reddish ring, about a degree in diameter, surrounding the moon, and outside of it a bluish band 20′ to 25′ wide, pretty well defined.

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December, 1881.

Date	Time	M	Barometer	Attached thermometer No. 4		Minimum before and after setting		Maximum before and after setting		Gauge	Rainfall in inches	Wind	Clouds.
1	9½		29.709	46.0	47.3	40.0	46.4	56.3	47.0	0 3/4	0.066	0 calm	10 P mist
2	9½		30.348	43.4	37.3	33.0	36.4	57.5	37.5	3	0.265	2 NW	4 P Rs
3	9¾		30.314	40.0	32.3	29.0	32.0	40.7	33.0	0		0 N	10 P
4	9½		30.261	40.1	38.1	31.4	37.8	40.8	38.5	0 5/8	0.055	1 E	10 P 7m; a little rain
5	9½		30.348	41.1	36.8	34.9	36.2	39.5	37.3	0 1/4	0.022	1 NW	10 P 7m
6	9¾		30.200	38.0	31.2	24.3	30.8	40.4	31.7	0		1 S	6 P 7m
7	9½		29.582	42.0	46.0	30.3	45.1	45.7	45.4	2 3/4	0.210	1 S	10 Pm; raining
8	9½		29.670	37.9	31.4	28.8	30.8	47.0	31.7	1 1/8	0.165	2 W	0 7m
9	9½		30.009	37.1	34.9	25.2	34.3	38.8	35.3	0		2 SW	6 P2 Pm 7m
10	9¼		30.162	37.8	26.9	26.2	26.2	43.8	27.5	0		2 N	0 M 7m
11	9¼		30.469	27.2	14.1	9.8	13.3	27.8	15.3	0		2 NW	0
12	9¾		30.574	30.7	27.8	13.2	27.7	28.5	28.7	0		2 S	10 P
13	9¾		30.114	39.8	42.8	27.8	42.0	44.5	42.4	0 1/4	0.011	1 S	10 P 7m
14	9¾		29.850	46.8	59.7	41.9	58.7	59.0	57.7	0		3 SW	10 Pm 7m M
15	9½		30.166	42.3	28.2	27.2	27.2	63.0	29.2			2 N	10 P; snowing
16	9½		30.505	19.0	14.5	10.5	13.8	29.5	15.3	See p. 129	0.474	2 N	0
17	9¾		30.271	30.7	28.4	13.7	27.4	28.5	28.8	0		2 W	2 P2 Rs
18	9½		30.068	34.3	33.6	26.1	33.1	36.8	33.8	0		2 SW	7 P2 Rs 7m →
19	9½		30.400	36.7	34.7	30.2	34.1	45.9	34.7	0		1 W	0 P Rs
20	9½		30.250	37.9	36.8	30.6	36.2	42.2	36.9	0		1 SW	7 P Rs 7m →
21	9½		30.394	37.3	34.9	31.5	34.1	46.0	35.0	0		1 N	4 P R 7m →
22	9¾		30.174	38.0	37.9	28.2	37.3	41.0	38.0	0		1 SE	10 P
23	9½		29.418	46.6	44.4	37.3	43.9	52.7	44.2	4	0.353	2 N	10 P; raining
24	9¾		30.160	30.8	16.9	14.8	16.1	44.3	18.0	0 1/2	0.044	2 N	0
25	9½		30.244	31.0	28.4	16.0	27.7	28.5	28.8	0		2 SW	0 Rs 7m
26	9¾		30.161	37.1	38.9	27.3	38.2	40.3	38.6	0		1 SW	10 P 7m →
27	9¾		30.042	43.4	47.5	38.2	46.7	48.0	46.9	See p. 130	0.783	0 NE	10 P raining
28	9¾		29.909	43.0	41.9	40.3	41.3	47.3	41.8	0 1/4	0.022	1 N	10 P
29	10½		29.900	43.9	43.6	41.2	42.8	43.7	43.1	0 1/8	0.011	1 SE	10 Pm
30	9¼		29.154	47.0	41.5	39.6	40.7	54.4	42.0	7 1/2	0.662	2 W	9 Pm 7m →
31	9¼		29.488	38.4	29.6	27.3	29.0	43.0	30.8	0		1 SW	2 P2 Rs 7m
			932.284	1186.5	1088.3	876.3	1067.3	1346.9	Mercury at sea level inside		3.143	44.	197
	9.6		30.074	38.3	35.1	28.3	34.4	43.4			Rainfall	1.4	6.4

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December, 1881.

Date.	Time P.M.	Barometer attached	Thermometer No. 4		Wind	Clouds.	Time P.M.	Zodiacal light.	Time P.M.	Aurora.	Reports to Signal Service.
1	11	29.967	49.2	42.4	1 SW	0	11	Moonlight	11	Moonlight	None
2	9	30.400	43.9	31.6	0 NW	9 PRS 7m	9	Cloudy	9	Cloudy	None
3											Obsc.
4											Obsc.
5	9	30.288	42.9	32.1	1 SW	2 P 7m haze	9	Moonlight	9	Moonlight	None
6											Obsc.
7											Obsc.
8	9	29.950	39.1	28.9	1 SW	0	6½	Conspicuous	9	Moonlight	Aurora
9	9½	30.062	41.2	34.5	1 SE	9 P RS	9½	Cloudy	9½	Cloudy	None
10	10	30.306	32.5	15.8	2 N	0	6 Distinct 10 Suspected in moonlight		10	Suspected in moonlight Distinct	Aurora
11	8½	30.514	32.8	21.0	1 SE	8 P haze	6	Visible	8½	Cloudy	None
12											Obsc.
13											Obsc.
14											Obsc.
15	8¾	30.299	32.3	21.6	2 N	0	7¼	Visible	8¾	None	None
16	9	30.462	29.8	17.6	1 S	0	6	Distinct	9	None	None
17											None
18	11¼	30.249	41.1	35.3	1 W	0	6½	Distinct	11¼	None	None
19	9	30.344	38.9	33.2	1 S	9 P 7m	6¼	Distinct	9	Cloudy	None
20	8½	30.165	42.4	40.5	0 S	10 P	8½	Cloudy	8½	Cloudy	Obsc.
21											None
22											Obsc.
23											Obsc.
24											None
25	10½	30.168	38.3	34.2	2 W	0 RS			10½	Faint streamers	Aurora
26											Obsc.
27	9	29.807	44.4	43.4	3 NE	10 P	9	Cloudy	9	Cloudy	Obsc.
28											Obsc.
29	11	29.294	46.1	54.0	3 S	10 RS 7m	11	Cloudy	11	Cloudy	Obsc.
30											None
31	9¼	29.581	39.4	27.9	2 SW	1 P RS	9¼	Moonlight and haze		Moonlight and clouds	None

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December 1881.

1, 11¼ P.M. Day cloudy and warm, with rain; evening ~~2, 1¼ A.M.~~ clear after 5½ P.M.; no aurora seen.

2, 9¼ P.M. Day mostly clear and cool, with thin clouds; evening somewhat clear with occasional thin clouds; thicker clouds from the west about 8 3/11 P.M.; now mostly cloudy; no aurora seen.

3, 9¾ A.M. Occasional lunar halos and coronas among thin clouds last night; one well formed halo about 10½ P.M.

4, 9½ A.M. Yesterday cloudy and cool day and evening, with a little rain and snow.

5, 9½ A.M. Yesterday cloudy day and evening, with a little rain and snow.

5, 11 P.M. Day cloudy at first soon rather clear; evening clear, with a few passing clouds early; auroral light very slightly suspected 10 & 11 P.M. over dark sky or clouds low in the north.

7, 9½ A.M. Yesterday cloudy and cool day and evening.

8, 9½ A.M. Yesterday cloudy and somewhat rainy; gradually clearing late in the evening.

8, 6 3/11 P.M. Day clear and rather cold. Clouds in the north, auroral light well developed above them by 6½ P.M.; the ~~auroral~~ western end of the light reaches beyond the cloud-bank, which ~~thins out~~ tapers toward the west, so that lighter sky is visible below its end. Zodiacal light conspicuous; about 6½ P.M. a dark space could be seen pretty certainly between its north preceding edge and the band from Aquila.

8, 7¼ P.M. Clouds below auroral arch now mostly moved off to the east and lower; sky below ~~and~~ little darker than that above.

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8, 11 P.M. Auroral streamers bright and changeable 8 to 8½ P.M. notwithstanding moonlight; not seen after 8½ P.M.

9, 9½ P.M. Day cool, mostly cloudy; evening partly clear 7 to 8 P.M., with much haze, later more cloudy again; no aurora seen.

10, 10¼ P.M. Day and evening clear, cold; auroral arch N&W and rather faint 6 P.M. and later; sky below not noticeably dark; thought to be still visible after moon rose.

12, 9¾ A.M. Yesterday clear, cold; evening at first clear, soon hazy; no aurora seen.

13, 9¾ A.M. Yesterday cloudy day and evening with a little rain.

14, 9¾ A.M. Yesterday cloudy day and evening; evening warm, stars occasionally visible.

15, 9½ A.M. Yesterday cloudy and warm day and evening; some rain.

15, 11¼ P.M. Day cloudy with a little snow, clearing off about 6½ P.M.; evening clear; no aurora seen.

16, 1¼ P.M. Gauge 5⅜ ounces; 0.474 inches.

16, 11¼ P.M. Day and evening clear and cold; no aurora seen.

18, 9½ A.M. Yesterday rather clear and cold; clouds somewhat thicker towards night; evening hazy, stars visible but faint; no aurora seen.

18, 11¼ P.M. Day and evening mostly clear, cool; no aurora seen.

19, 11½ P.M. Day mostly clear, cool; evening somewhat clear at first, clouds increasing; cloudy about 9 P.M.; somewhat clear now; no aurora seen.

21, 9½ A.M. Yesterday rather cloudy and cool; clouds increasing in the evening; cleared off suddenly about 1 A.M. today.

22, 12½ A.M. Yesterday rather cloudy; evening partly clear; no aurora seen; stellar light visible at 6 P.M. but not very

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December, 1881.

30.364; attached therm. 39.0; No. 4, 29.5.

23, 9½ A.M. Yesterday cloudy and warm day and evening, with a little rain.

24, 9¾ A.M. Yesterday cloudy with rain and snow; partly clear about midnight; no aurora seen.

25, 9½ A.M. Yesterday clear, rather cold; evening clear at first, cloudy after 9 P.M.; no aurora seen.

25, 10½ P.M. Day and evening clear, cool; slight aurora.

27, 9¾ A.M. Yesterday cloudy day and evening, with a little rain.

27, 9 P.M. Day cloudy with rain; not raining now. Gauge 8/7 inches; 0.783 inches.

29, 10½ A.M. Yesterday cloudy day and evening, with a little rain.

29, 11 P.M. Day and evening cloudy with some rain; evening very warm.

30, 9¼ A.M. Partly clear after 11 P.M. yesterday; more rain later.

31, 9¼ A.M. Yesterday cloudy at first, afterwards clear and cool; evening clear; no aurora seen.

31, 10½ P.M. Day mostly rather clear and cold; cumulus clouds at times; evening rather clear, but occasional thin clouds; fragmentary lunar halo about 9 P.M.; no aurora seen.

Report to Signal Service, sent Jan. 2, 1882.

Aurora regularly looked for on clear evenings: Dec. 5, auroral light very slightly suspected 10 to 11 P.M. over dark sky or clouds low in the north; Dec. 8, clouds in the north, auroral light well developed above them by 6½ P.M.; the western part of the light reached beyond the cloudbank, which moved eastwards later in the evening, showing the auroral arch, with the sky below it only a little darker than above; streamers bright and changeable 8 to 8½ P.M., notwithstanding moonlight; not seen after 8½ P.M. Dec. 10, auroral arch low and rather faint at 6 P.M.

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and later; sky below not noticeably dark; aurora thought to be still visible after the moon rose. Dec. 25; faint auroral streamers seen at 10½ P.M.

Zodiacal light — distinct Dec. 8, 10, 16, 18, 19; visible also Dec. 11, 15, 21; observations on other evenings hindered by moonlight or clouds.

Lunar halos. — Dec. 2, occasional lunar halos and coronas among thin clouds; one well formed halo about 10½ P.M.; Dec. 31, fragmentary lunar halo about 9 P.M.

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General remarks on observations for 1881.

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 ordinarily read only once a day, these readings are probably not the actual maxima and minima. The highest reading of the maximum thermometer (Casella 13399) and the lowest of the minimum (Green 2205), both uncorrected, are also given for each month.

	Barometer.								Temperature			
	Maxima				Minima				Max.		Min.	
	Date	Time	Barom.	Attached therm.	Date	Time	Barom.	Attached therm.	Date	C.13399	Date	G.2205
January	18	9¼ A.M.	30.495	25.4	14	9¾ A.M.	29.587	34.3	15	41.3	1	−6.0
February	7	9¼ A.M.	30.712	22.3	13	9 A.M.	29.219	38.0	11	48.6	3	−7.1
March	15	9½ A.M.	30.285	34.7	31	9½ A.M.	28.902	37.4	17	49.8	27	24.3
April	30	10½ P.M.	30.308	51.2	5	1⅔ P.M.	29.248	31.6	29	69.0	5	19.6
May	1	9¼ A.M.	30.386	46.4	15	9¼ A.M.	29.694	60.0	28	86.4	1	32.4
June	7	9½ A.M.	30.206	56.0	29	9¾ A.M.	29.588	69.5	29	83.5	4	43.7
July	30	9 A.M.	30.357	68.0	19	11½ A.M.	29.633	66.4	11	87.0	20	53.1
August	25	9¼ A.M.	30.330	65.5	10	9½ A.M.	29.617	72.9	6	90.1	17	52.2
September	16	9¾ A.M.	30.463	64.6	1	9¾ A.M.	29.894	75.9	8	92.6	20	45.8
October	2	9½ A.M.	30.549	70.1	25	9¼ A.M.	29.492	51.0	2	82.8	12	31.2
November	16	10¼ A.M.	30.573	38.3	4	9½ A.M.	29.354	53.2	10	68.0	23	13.2
December	12	9¾ A.M.	30.544	30.7	30	9¼ A.M.	29.154	47.0	15	63.0	11	9.8

Range of barometer 30.712 Feb. 7 to 28.902 March 31
" " temperature 92.6 Sept. 16 " −7.1 Feb. 7

Observers

A. Searle usually; O. C. Wendell Aug. 1; J. R. Edmands and O. C. Wendell Aug. 15–18; J. R. Edmands and S. C. Chandler, Jr., Sept. 16 to noon of Sept. 26 inclusive; observations of Gegenschein February to May in part by O. C. Wendell.

Times of observations

Observations made 9 to 10 A.M. and occasionally at other times especially on

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clear evenings; time recorded with each observation. In the evening observations recorded on the second page 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 the columns headed "Zodiacal Light" and "Aurora", contain the times to which the record of those phenomena relates; but the record was often made later in the evening, as just explained.

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 page 50 of this book. The barometer and thermometers in and just outside northeast corner of West Transit Room, as in 1880.

Wind recorded as in 1880; see pages 50, 51, of this book.

Clouds " " " " " " " " " " " " .

Reductions. The barometric means reduced to the freezing point are entered below the uncorrected means; no other corrections are applied. The reductions are in part by Mr. C. C. Eaton.

Reports to Signal Service. The results reported monthly to the Signal Service are also recorded in this book; see page 51.

Gegenschein. Observations of Gegenschein were occasionally made by A. Searle and O. C. Wendell; it was seen or suspected on Feb. 19, 23, 24, 25; March 24, 28; April 4, 18, 20, 30; May 2, 3; Sept. 30. The record contains many observations on the distribution of light in the zodiacal region. The observations of Gegenschein Feb. 19 to April 4 inclusive were published in No. 2376 of the Astronomische Nachrichten, (Vol. 99).

Phenomena. The rainfall of the first quarter of the year was large, and restored the level of the ponds. The dense clouds of Sept. 6 made the day so dark as to attract general notice.

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January 1882.

Date	Time A.M.	Barometer	Attached Thermometer	No. 4	Minimum before and after set	Maximum before and after set		Gauge	Rainfall in inches	Wind	Clouds
1	10¼	29.816	36.4	28.1	25.1	27.2	36.7	29.0	0		2W	0 Rs
2	9½	29.608	28.3	13.3	10.6	12.2	31.7	13.5	see p. 136	0.670	3NW	8 Pr Rs
3	10¼	30.000	25.0	12.3	3.7	11.3	lost by interruption	14.2	0		2W	1 Pr Rs
4	9¾	30.322	20.5	5.4	2.7	5.0	22.4	8.0	0		2NW	0
5	9¾	30.650	21.0	4.7	0.2	4.2	14.1	7.0	0		2NW	0 Pr Rs
6	9½	30.396	26.0	19.3	4.2	18.9	20.7	20.2	0		1N	10 Pr
7	9¾	29.890	33.3	35.8	18.8	35.2	35.5	35.5	2⅜	0.210	2W	9 Pm Fm
8	9¼	30.187	32.6	26.1	21.0	25.6	39.0	26.9	0		1SW	10 P Fm
9	9½	29.698	29.8	46.8	25.3	46.1	46.4	46.0	0½	0.044	1W	9 P Rs Fm →
10	9	30.199	36.7	32.3	29.8	31.8	47.0	32.4	0		1W	0 Rs Fm
11	9¾	29.930	35.1	32.1	24.1	31.3	37.8	32.1	see p. 136	0.631	1SE	10 P, snowing
12	9¾	30.178	34.9	35.4	27.1	34.5	35.0	35.0	0⅝	0.055	2NW	0 Fm
13	9¼	30.180	32.3	22.3	16.9	22.1	36.0	23.6	0		1NE	10 Pr
14	9½	29.406	36.6	38.1	21.9	37.3	38.5	38.0	see p. 137	0.342	3W	3 Pm Fm ↘
15	9½	29.919	30.9	23.4	16.9	22.9	38.4	24.8	0		2SW	0 P Rs
16	9½	29.634	35.7	37.7	22.7	37.2	37.6	37.6	0⅛	0.011	1SW	4 P Rs Rm →
17	9½	29.958	34.8	18.2	17.4	17.4	43.0	20.0	see p. 137	0.588	2N	10 Pr, snowing
18	9¾	30.447	24.9	0.7	−3.8	0.5	20.2	23.5	0		1W	1 P Rs Fm
19	9½	29.951	32.0	28.6	0.6	28.2	32.0	29.2	1⅛	0.099	1NW	8 P Rs Fm →
20	9½	30.350	28.5	15.7	12.1	15.0	36.0	17.5	0		1NW	10 P Fm ↑
21	9½	30.061	31.7	31.3	15.0	30.9	31.2	31.3	0		Ocalm	10 Pr
22	9½	29.461	35.0	36.7	30.8	36.0	36.2	36.3	4⅞	0.430	2W	0
23	9¾	29.918	not read estimated 15.0	2.9	1.5	2.3	38.8	5.0	0		3NW	0
24	9¾	30.578	not read estimated 5.0	−9.6	−14.4	−10.0	6.1	Below graduation	0		2NW	0
25	10	30.550	not read estimated 15.0	11.2	−10.0	10.8	12.5	13.0	0		1SW	5 Pr Rs
26	9¾	29.838	28.6	39.8	10.7	39.1	39.5	39.0	6⅜	0.563	1SW	10 P, raining
27	9¼	29.530	43.0	44.5	36.9	43.8	46.5	44.0	3¼	0.287	4NW	0 Fm
28	9¼	30.222	32.4	24.7	22.9	24.3	45.0	25.4	0		1N	10 Pr
29	10	29.590	33.2	27.1	24.0	26.3	34.0	27.9	2¾	0.243	3W	0 Rs M
30	9¼	29.954	24.7	18.0	9.0	17.5	28.0	19.6	0		2SW	9 Pr Rs
31	10	29.850	27.3	23.9	14.3	23.2	28.0	24.7	0		1SW	10 Pr
	9.6	930.273 30.009 −.002	906.2 29.2	746.2 24.1	494.4 15.9	723.1 23.5	993.8 32.1	Max yet inside building	See p. 136, 137	4.459 Rainfall for month	52 1.7	157 5.1

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Date	Time P.M.	Barometer	Attached Thermom.	No 4	Wind	Clouds.	Time P.M.	Zodiacal Light	Time P.M.	Aurora	Report & Signals
1											Obsc.
2	10½	29.858	26.0	9.4	1 W	0	10½	Moonlight	10½	Moonlight	None
3											None
4	9½	30.536	24.7	6.3	2 NW	0	9½	Moonlight	9½	Moonlight	None
5											None
6											Obsc.
7	10¼	30.096	36.7	30.7	1 SW	2 Ci Rs	8	Conspicuous	10¼	Moonlight	None
8											Obsc.
9	9¼	29.950	40.4	36.7	2 SW	1 P	8	Conspicuous	9¼	None	None
10											Obsc.
11	6¾	29.772	36.4	33.4	1 SW.	0 Rs	6¾	Conspicuous	6¾	Slight, suspected	Aurora
12	9	30.380	36.0	22.0	1 N	1 P haze	7½	Distinct	9	None	None
13											Obsc.
14	9	29.874	34.7	23.0	0 S	0	6¼	Conspicuous	10	Arch	Aurora
15	10½	29.850	35.8	27.6	0 calm	0 haze	7	Visible; clouds	10½	None	None
16											Obsc.
17	8½	30.245	30.8	12.6	1 N	0	6½	Conspicuous	8½	None	None
18											Obsc.
19	9	30.208	34.0	24.3	1 NE	0	6½	Conspicuous	9	Arch	Aurora
20											Obsc.
21											Obsc.
22	9¾	29.702	30.7	13.1	4 NW	0	9¾	Perceptible	9¾	None	None
23	8¾	30.218	out of sight 15.0	−2.0	2 NW	0	8¾	Moonlight	8¾	Moonlight	Aurora
24	8¼	30.660	out of sight 3.0	0.0	0 NW	0	8¼	Moonlight	8¼	Moonlight	None
25											Obsc.
26											Obsc.
27	8½	30.168	39.2	34.7	2 NW	0 Rs	8½	Inspected in moonlight	8½	Moonlight	None
28											Obsc.
29	8½	29.809	29.0	14.2	3 NW	0	8½	Moonlight	8½	Moonlight	None
30	9½	29.948	31.9	21.2	2 S.S.W.	0	9½	"	9½	"	None
31	9	29.332	30.7	28.0	1 a N.E.	10 P.	9	Cloudy	9	Cloudy	Obsc.

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January 1882.

2, 9½ A.M. Yesterday clear at first, soon cloudy, with snow in the evening.

2, 4 P.M. Snow measured in 10 places: $4\frac{3}{4}$, 5, $5\frac{1}{2}$, $4\frac{3}{4}$, $5\frac{1}{2}$, 7, $7\frac{1}{2}$, $5\frac{3}{4}$, 4, $5\frac{3}{4}$; mean 5.550 inches. $19\frac{1}{2}$ inches in cylinder $1\frac{7}{8}$ inches across weigh $3\frac{3}{4}$ ounces. Hence rainfall to 1 inch of snow $\{2.7977, 2.7400, 0.5740, 0.7443\}$ 0.1207 inches; total rainfall 0.670 inches. Gauge cleared out.

2, 11⅚ P.M. Day at first cloudy, soon clear and cold; evening clear; no aurora seen; No. 4 now 8.7.

4, 9¾ A.M. Yesterday clear and cold; clouds after 6 P.M.; mostly clear 11¼ P.M.; no aurora seen.

4, 11 P.M. Day and evening clear and cold; no aurora seen.

6, 9½ A.M. Yesterday clear and cold; evening mostly cloudy, clouds broken at times; no aurora seen.

7, 9¾ A.M. Yesterday cloudy with a little snow and in the evening some rain.

7, 11½ P.M. Day cloudy at first, soon clear and cool; evening mostly clear, with some clouds after 10 P.M.; no aurora seen.

9, 9½ A.M. Yesterday cloudy day and evening with a little rain.

9, 10¼ A.M. Day cloudy at first, gradually becoming clear; a few clouds at times in the evening; no aurora seen.

11, 9¾ A.M. Yesterday rather clear till towards night, growing cloudy in the evening; snow began falling during the night.

11, 12¼ P.M. Snow now changing to mist. Depth in 10 places $4\frac{1}{2}$, 5, 5, 5, $4\frac{1}{2}$, $4\frac{3}{4}$, $4\frac{3}{4}$, 5, 5, $5\frac{1}{2}$; mean 4.850 inches. Weight of $20\frac{1}{2}$ inches of this snow in cylinder $1\frac{7}{8}$ inches across $4\frac{1}{4}$ ounces. Hence rainfall to 1 inch of snow $\{2.7977, 2.7673, 0.6204, 0.6347\}$ 0.1304 inches; total rainfall 0.631 inches. Gauge cleared out.

11, 10 P.M. Day cloudy with a little snow after above measures; clear after 7 P.M.; zodiacal light conspicuous early in the evening, still somewhat visible; the cone seems nearly to reach ν Piscium, while early in the evening it seemed to cover about

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27 Piscium. Auroral light suspected early; topo distinct arch seen 9½ P.M. and later; sky no darker below it than at the same altitude elsewhere.

11, 11 1/12 P.M. Auroral arch now broken; some streamers visible.

12, 10¼ P.M. Day clear and cool; evening rather clear; some haze and clouds, increasing, especially after 9 P.M.; no aurora seen.

13, 6¾ P.M. Day cloudy, with snow about 10 A.M. and later, followed by a little mist in the afternoon; two or three inches of snow in all; gauge now 3¾ ounces, 0.331 inches; this measure probably the most correct method of determining the rainfall, as there was little or no wind during the day.

14, 9¼ A.M. Yesterday evening cloudy and misty. Gauge this morning ⅛ ounces, 0.011 inches; hence total rainfall 0.342 inches.

14, 10¾ P.M. Day rather clear at first then cloudy with a little snow about 10¼ A.M.; afterwards mostly clear; evening clear with auroral arch, first noticed at 7½ P.M. and still continuing; sky rather dark below; at 9 P.M. the arch was highest, its upper edge reaching β and γ Draconis, variable light below it at times.

15, 10½ P.M. Day rather clear and cool; evening somewhat cloudy at first, clear later; no aurora seen.

17, 9½ A.M. Yesterday rather cloudy, clouds increasing towards night, with a few snowflakes late in the evening.

17, 4½ P.M. Snow ceased about noon. Depth of new snow 4¼, 4, 4½, 4¼, 4½, [illegible], 3¼, 3¾, 4, 4, 3¾; mean 4.025 inches. 20 inches in cylinder 1¼ inches across weigh 4½ ounces. 9.7977 / 8.8440 / 0.9537 Hence rainfall is 1 inch of snow 0.0238 inches; total rainfall 0.558 inches.

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January, 1882.

17, 11½ P.M. Afternoon and evening clear, growing colder; no aurora seen. No. 4 nov 5.3. Examined zodiacal region for gradations of light; sky whitish especially in the north as high as 20°; evidently some haze. But Leo is decidedly dark as compared with adjacent regions, and there is no more light north of Regulus than in the regions of β and δ. Bands in form of ogival enclosing neck of Hydra as last year; also band between Leo and Sextans but haze interfers with observation. The distinct branch of the Milky Way from the cluster in Perseus towards Jupiter ends rather abruptly, and seems to have no connection with the extension of the Milky Way towards the Pleiades.

18, 1 A.M. Clear, no aurora. Less haze than before. Region of Leo as above. No. 4 nov 5.6.

19, 9½ A.M. Yesterday clear and cold, growing cloudy and milder; evening cloudy; a little sleet during the night.

19, 11½ P.M. Day rather clear and cold; evening clear; aurora over dark sky visible at 6 P.M. before end of twilight; a rather bright arch all the evening without streamers, double at times.

21, 9½ A.M. Yesterday cloudy and chilly day and evening.

22, 9½ A.M. Yesterday cloudy day and evening, with a little snow and rain.

22, 11 P.M. Day clear, warm at first, becoming windy and cold; no aurora seen.

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

24, 9¾ A.M. Faint aurora recorded near midnight last night by O. C. Wendell in book R 100.

24, 11 P.M. Day [illegible] and evening [illegible] cold;

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January, 188~~2~~3

No. 4 now — 3.7; no aurora seen; some zodiacal light apparently visible both at 8¼ P.M. and now, notwithstanding the moon; it may be an effect of moonlight, but no reason appears for its taking the usual conical form.

26, 10½ A.M. Yesterday cloudy, cold abating; snow in the evening, rain this morning.

27, 9¼ A.M. Yesterday cloudy with rain part of the forenoon and in the evening.

27, 10 P.M. Day and evening mostly clear and cool, with passing clouds. No aurora seen.

29, 10¼ A.M. Yesterday cloudy with snow after 2 P.M. Snow this morning about 2¼ inches deep; this confirms measure of rainfall by gauge.

29, 10½ P.M. Day clear and windy, growing cold; no aurora seen.

30. 11¾ P.M. Day quite clear and gradually growing a little warmer. — no aurora seen. W. obs.

31. 9 P.M. Cloudy throughout the day — commenced snowing the middle of the afternoon. Snowing hard at the present time — Perhaps some eight inches have already fallen. W.

Report to Signal Service sent Feb. 1882.

Aurora regularly looked for on clear evenings. Jan. 11, auroral light suspected early, low, distinct bank seen 9.30 P.M, and later; sky was darker below it than at the same altitude elsewhere. At 11.5 P.M. arch broken, some streamers visible. Jan. 14, Arch first seen at 7½ P.M., continued to 10¾ P.M.; sky rather dark below; arch high at 9 P.M.; upper edge reaching β (Beta) and γ (Gamma) Draconis; variable light below it at times. Jan. 19, Aurora overdark sky at 6 P.M. before end of twilight; rather bright arch all the evening without streamers, double at times. Jan. 23, faint aurora near midnight.

Zodiacal Light conspicuous Jan. 7, 9, 11, 14, 17, 19; distinct Jan. 12; visible Jan. 15; perceptible Jan. 22; suspected in moonlight, Jan. 27.

Jan. 11 conspicuous early in the evening; somewhat visible at 10 P.M.; when the cone of light seemed nearly to reach ν (Nu) Piscium; early in the evening it seemed to cease about 27 Piscium. ~~by visible~~

Jan. 24. Some zodiacal light apparent at 8½ P.M.; also at 10 P.M. through moonlight. Possibly effect of moonlight, but no reason appeared for its taking usual conical form.

Observations on other evenings hindered by moonlight or clouds.

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February 1882.

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	9¾	29.712	30.3	27.0	22.8	26.8	34.0	38.0	See p. 142.	1.810	2. N.N.W.	0.	1
2	9½	29.916	34.4	28.1	23.0	27.2	38.4	29.0	0		1 SW	0 Rs	2
3	11½	29.760	36.9	33.2	25.5	32.9	37.8	39.0	See p. 142.	0.121	5 N.N.W.	1 Pr.	3
4	9¼	30.064	24.0	3.7	0.5	4.0	39.1	16.2	0		2. N.	10 P.	4
5													5
6	11	30.000	25.2	20.7	3.8	20.0	23.2	24.0	See p. 143	1.267	1 N.N.W.	1 Rs.	6
7	10¾	30.284	25.2	23.7	9.0	23.0	27.2	28.6	0		1 N.E.	10 P.	7
8	9½	29.748	31.7	37.8	23.0	38.0	38.8	38.8			2. N.	1 Rs.	8
9	9½	29.984	29.5	21.2	12.0	20.8	39.7 ~~27.0~~	27.0 ~~39.7~~	See p. 143	0.099	1. N.N.W.	5 Rs.	9
10	9½	29.418	33.9	32.0	20.3	31.7	37.2	33.4	See p. 143	0.816	2. N.W.	10 P.	10
11	9½	30.454	28.8	20.8	19.2	20.0	37.7	24.3	See p. 143	0.033	3. N.W.	0.	11
12	9½	30.483	31.0	34.7	15.0	34.0	34.3	34.1	0		2 SW	9 P 7m	12
13	9½	30.084	39.3	43.8	See p. 144	42.9	43.8	44.0	0		3 S.W.	10 P.	13
14	~~9~~	~~30.145~~	~~37.2~~										14
15	9	30.145	37.2	33.3	28.0	33.0	48.0	33.6	0⅜	0.033	1 SW	4 Pn 7m ←	15
16	9	30.210	39.2	36.2	31.4	35.8	47.8	36.6	0		1 S	0 haze	16
17	9	29.728	43.7	45.1	35.7	44.6	50.2	45.0	4⅛	0.364	2 NW	1 P 7m	17
18	10	30.668	25.8	10.2	7.4	10.0	47.3	12.7	0		2 NW	0	18
19	9¾	30.506	25.5	16.7	9.0	16.0	18.3	18.0	0		1 NW	10 Pn	19
20	9	29.920	31.7	32.1	15.9	31.8	31.7	32.0	0¾	0.066	1 W	10 P 7m	20
21	9¼	29.956	33.2	30.4	27.9	30.1	37.0	30.7			2 E	10 Pn; snowing	21
22	10¼	29.534	28.9	23.9	18.2	23.2	32.1	24.0	See p. 146	1.771	2 N	9 Pn	22
23	9	29.819	27.3	15.9	12.1	15.2	26.5	17.2	0¼	0.022	2 NW	9 Pn 7m ←	23
24	9	30.077	26.7	19.9	15.1	19.4	27.0	20.5	0		2 N	7 P 7m ←	24
25	9¾	30.334	27.7	22.3	15.1	21.7	30.7	23.0	0		1 N	0	25
26	9¾	30.244	29.5	25.4	16.5	24.8	33.8	26.0	0		1 SW	5 Pn Rs	26
27	9	30.111	34.2	36.2	24.8	35.5	41.2	36.0	0		1 SW	0 7m	27
28	9	30.411	37.0	36.0	32.0	35.3	46.0	36.0	0		1 N	10 P 7m ←	28
	9.6	781.570 30.060 −.008 30.052	817.8 31.4	710.3 27.3	463.2 18.5	737.7 28.4	948.8 36.5	Max set inside building	See Mr. 142–146	6.402 Rainfall for month 6.40 inches	45 1.7	132 5.1	

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February 1882.

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	29.884	34.1	24.2	1. S. W.	8 R. S.	9	Moonlight & cloyd	9	Moonlight and clouds.	None
2	10	29.842	36.3	26.2	2. S. W.	7 Rs.	10	"	10	"	None
3	12	30.064	30.0	10.1	2. N. W.	0	12	Moonlight.	12	Moonlight.	None
4	11½	29.462	27.3	22.8	7. N. E.	10 P.	11½	Cloudy	11½	Cloudy	Obsc.
5											Obsc.
6	9¾	30.220	28.1	13.7	1. N. W.	0.	9¾	Moonlight	9¾	Moonlight.	None
7											Obsc.
8	9¾	30.050	35.5	27.2	0. N. W.	0.	9⅓	Plainly Vis.	9⅓	Fine Streamers.	Aurora
9											Obsc.
10											Obsc.
11	11½	30.598	31.8	17.8	1. S. W.	0.	7	Bright.	11½	Faint traces.	Aurora
12											None
13											Obsc.
14	9	30.110	43.3	35.7	1 SW	0	9	Still distinct; conspicuous earlier	9	None	None
15	9	30.160	43.9	39.7	1 S	3 Phaze	9	Visible; clouds	9	None; clouds	None
16											Obsc.
17	9	30.321	37.8	22.3	2 NW	0	9	Still distinct; conspicuous earlier	9	Bright broad arch; sky not very dark below.	Aurora
18	6½	30.668	30.2	16.6	1 N	0	6½	Twilight	6½	Twilight	None
19											Obsc.
20	9¼	30.050	34.6	29.8	1 N	8 Phaze	9¼	Cloudy	9¼	Cloudy	Obsc.
21											Obsc.
22											Obsc.
23	9¼	29.952	31.0	19.1	2 NW	4 Rs	9¼	Moonlight	9¼	Moonlight and clouds	None
24	9	30.188	30.7	24.0	2 NW	0	9	Moonlight	9	Moonlight	None
25	9	30.324	33.6	25.5	1 S	1 Phaze	9	Moonlight	9	Moonlight	None
26	8½	30.148	36.6	33.9	1 S	2 P Rs	8½	Moonlight and clouds	8½	Moonlight and clouds	None
27											Obsc.
28	9	30.359	41.4	35.7	2 SE	9 P 7m ſ	9	Moonlight and clouds	9	Moonlight and clouds	None

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February 1882.

1. 10. A. M. Slight haziness about horizon. W.
Very heavy snow storm last night. Cleared about sunrise. W.

1, 1¾ P.M. Gauge cleared out.

1. 10¾ P.M. Day rather mild – snow melting somewhat. W.

2. 10 A. M. Thin clouds the early part of last evening – then clear even. Later still, however, it became ~~cloudy~~ more cloudy. ~~Too~~ No aurora seen during the evening.

The amount of melted snow recorded in the observation of yesterday A. M. was obtained as follows, viz: The glass tube of 1⅞ inches diameter was carried from the top to the bottom of the snow some ten times in various places, and each time the tube with contained snow measured.

The mean of these ten weighings were then taken, and from this the weight of the tube subtracted. The logarithm of this quantity being then added to the "log. for reduction" at first of this book, and the corresponding quantity obtained gave the desired ~~quantity~~ value. W.

2. 10 P. M. Clear most of the evening: Cloudiness increasing somewhat during the latter part. No aurora seen. W.

3. 0¾ P. M. Light fall of snow last night, amounting to about ¾ in. in depth (of snow) Considerable water in gauge but not disturbed. W.

3. 12. P. M. Day quite windy with some cloud. Calmer toward night and colder. No aurora seen.

Weighed water in gauge at 3 P.M. 1¾ inches.

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February 1882.

4. 11½ P.M. Cloudy during day. - commenced snowing latter part of afternoon. A severe north easter in progress at present time. Considerable snow fallen.
W.

6, 1½ P.M. Yesterday cloudy with snow till about noon. Clouds thin most of the evening and bright stars visible. This morning, mostly clear and cool. Snow now much drifted; depth of new snow doubtful; measures give 4½, 9½, 10¼, 7½, 7½, 6½, 7¼, 7, 6½, 7½; mean 7.40 inches. 2½, 2½ inches in cylinder 1⅝ inches across weigh 6 ounces; 9.7977 / 8.6516 / 0.7782 / 0.1692 } thence rainfall to 1 inch of snow 0.1712 inches; total rainfall 1.267 inches. Gauge cleared out.

6. 12 P.M. Day generally clear, growing a little colder towards night. No aurora seen. Zodiacal light very bright and distinct the early part of evening; and before moon rose.
W.

8. 9½ a.m. Cloudy throughout the day yesterday. Some rain last night. Cleared towards morning.
W.

8. 11 P.M. Day ~~clear~~ generally clear and mild. Snow melting considerably. Fine aurora this evening with traces of it still visible.
W.

9, 10 A.M. Gauge 1⅛ ounces, 0.099 inches. Bottle not in place, and result approximate only but probably about correct. This rainfall belongs to Feb. 7–8.

10. 9½ a.m. Cloudy yesterday. Commenced ~~raining~~ snowing in afternoon, gradually turning to rain. Rain during night. Snowing this morning. 9¼ ounces of rain and melted snow up to this time; 0.816 inches.
W.

10, 5½ P.M. Gauge now 0⅜ ounces, 0.033 inches.

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February 1882

11. ~~7~~ 9½ A.M. Generally cloudy during the day yesterday, gradually clearing. Some stars visible during the latter part of last evening through thin places in clouds, but much cloud all the while about horizon (W.)

11. 11½ P.M. Clear during day. Snow melting considerably. Colder towards evening. Faint traces of aurora low down in north but not very noteworthy. W.

12, 9½ A.M. Thermometer No. 4 moved yesterday afternoon from east to west side of the wooden shelter of the thermometers.

13. 9½ A.M. The movable metallic index of minimum thermometer was found in the bulb this morning, consequently only the reading "after setting" could be taken.
Somewhat cloudy yesterday especially in latter part of day and evening. Weather rather mild. Snow melting some. No aurora seen. W.

15, 10 A.M. Feb. 13 was cloudy and warm with some rain; Feb. 14 mostly clear and warm; no aurora seen. Region of Leo occasionally examined from 9 to 11 P.M.; the sky seemed somewhat hazy, but the usual bands were tolerably visible. There was a persistent appearance of some faint light near ε Leonis, between which and γ Leonis the sky seemed a little brighter than between θ and ε Leonis, the difference being most marked late in the evening when the stars were higher. This light was connected with the usual band from Regulus to θ Leonis, so that its preceding limit could not be seen. Its following limit was about half

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way from α to θ Leonis. Its centre was estimated to be between η and 34 Leonis, say 10h 3m, +16°. Leo examined a few evenings ago, on some occasion since the moon was last full, but nothing then made out. Feb. 14. Place of Sun 21h 54m, −12° 42'.

16, 9 A.M. Yesterday rather clear and warm; evening hazy and partly cloudy; no aurora seen.

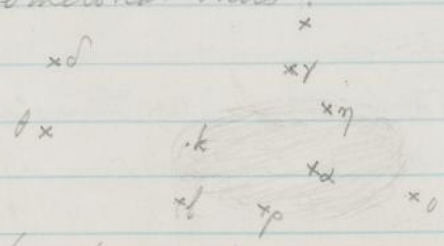
17, 9 A.M. Yesterday warm and rather clear at first, then cloudy; evening cloudy with a little rain.

18, 10 A.M. Yesterday clear and warm becoming cold with strong wind early in the evening, less wind later. Aurora arch, bright and broad, not seen early, but thought to be visible about 7½ P.M., very distinct later; some streamers about 10½ P.M. Gegenschein strongly suspected at 10½ to 11 P.M. pretty much as Feb. 14; it seemed to extend as far as κ and ι Leonis, and northwards as far as ζ Leonis; the preceding limit is not yet distinguishable.

Place of Sun Feb 17 22h 6m −11° 38'.

Gegenschein Feb. 18 ι Leonis 10h 15m +17°.5

19, 9¾ A.M. Yesterday clear and cold; haze and clouds coming on from the west late in the evening; no aurora seen; Zodiacal light distinct 7 P.M. and later, but hardly as bright as the night before (perhaps owing to incipient haze in the west). Gegenschein suspected about 10½ P.M. much as yesterday, but looked somewhat smaller than before, and as if the preceding limit was beginning to separate from the light sky between Praesepe and σ Leonis; somewhat thus:



10h 12m +13°
Place of Sun
22h 14m −11° 0'

There might be a suspicion that the effect was due to light [illegible] ι Leonis, but

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not reaching β Leonis, the sky around which was relatively dark. Orion was rather hazy, but without any such appearance around its bright stars as there was around α Leonis. The bands in Hydra, Lyra, and Sextans, could be seen, but were faint. The sky south of α Leonis seemed hardly as bright as that around and immediately north of it.

20, 9 A.M. Yesterday cloudy day and evening, with a little snow.

21, 9¼ A.M. Yesterday rather cloudy; evening somewhat clear but obscured near horizon.

21, 12¼ P.M. Bulb of No. 4 immersed in snow and water since 9¼ A.M.; now reads 32.3 as in 1879 (see book Q5, pages of remarks preceding observations of 1878). Temperature today near freezing point, so that the part of the scale not immersed will not seriously affect the temperature of the bulb.

21, 1 P.M. No. 4 now reads 31.3; the snow and water having been removed after the observation at 12¼ P.M.

22, 10¼ A.M. Yesterday cloudy day and evening, with snow and sleet.

22, 12 M. A little snow now falling. Snow of yesterday measured; 6, 5½, 4¾, 5½, 4½, 5½, 5½, 5, 5¼, 5¾; mean 5.325 inches. 21 inches in cylinder 1⅞ inches across weigh 11½ ounces; hence rainfall to 1 inch of snow 0.3325 inches; total rainfall 1.771 inches; gauge cleared out (4½ ounces, 0.397 inches; result from measurement adopted; much wind at times yesterday). The snow was largely mixed with sleet, so as to be unusually heavy.

$$\begin{array}{r} 9.79770 \\ 8.67778 \\ 1.02630 \\ 9.52178 \\ 0.72632 \end{array}$$

23, 9 A.M. Yesterday cloudy day and evening, with a little snow.

23, 9¼ P.M. On Feb. 21, at about 7ʰ 55ᵐ P.M. during the fall of snow and sleet that day, Professor Pickering saw a flash of lightning and heard thunder; more

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thunder and lightning also said to have occurred that evening.

24, 9 A.M. Yesterday rather clear; evening partly cloudy at times; no aurora seen.

24, 10 P.M. Day somewhat cloudy, evening clear; no aurora seen; some appearance of zodiacal light in the presence of the moon, below which there seemed to be a nearly vertical band of light. Perhaps the probable explanation is that the illumination of the atmosphere by the moon reaches farthest on the lower side where there is most reflecting matter, and joins the light sky near the horizon so as to make the eye disposed to see a band not ~~vide~~ nearly parallel to the ^ Ecliptic more than they actually are.

25, 10 P.M. Day and evening clear and cool; some haze; no aurora seen.

26, 8¾ P.M. Day rather clear, with some thin clouds; lunar halo about 7 P.M., with α Tauri about on inner edge.

27, 9 A.M. Clear late last night; no aurora seen; some effect of light downwards from the moon as on Feb. 24, this time out of the zodiac.

28, 9 A.M. Yesterday clear, warm; evening cloudy.

28, 10⅓ P.M. Day mostly clear, warm; evening cloudy after 8¼ P.M.; no aurora seen.

March 1, 9 A.M. Very distinct lunar corona about 8¼ P.M. yesterday.

Report to Signal Service sent Mar. 2, 1882.

Aurora regularly looked for on clear evenings. Feb. 8, fine aurora with fine streamers ^ in the evening; traces visible at 11h P.M. Feb. 11, faint traces of aurora at 11h 30m P.M., low down in the north but not very noteworthy. Feb. 17, auroral arch, bright and broad, not seen early, but thought to be visible about 9h 30m P.M.; very distinct later; some streamers about 11h 30m P.M.

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Zodiacal light distinctly seen on Feb. 6, 8, 11, 14, 17; Feb. 11, at 7h P.M., it was bright. Feb. 15, visible at 9h P.M.; Feb. 24, 10h P.M., some appearance of zodiacal light in presence of moon. Another evening, observations hindered by moonlight, clouds or haze.

Lunar halo, Feb. 26 about 7h P.M., with a (Alpha) Tauri about on inner edge.

Lunar corona Feb. 28, very distinct at about 8h 15m P.M.

Thunder and lightning. Feb. 21, about 7h 55m P.M., during the fall of snow and sleet that day, Prof. Pickering saw a flash of lightning and heard thunder; more thunder and lightning is said to have occurred that evening.

Abbreviations of posits.

c Change thought to have occurred in the distribution of light either at the time of observing Gegenschein by memory of former appearance, or somewhat later the same season by present appearance and memory of Gegenschein.
m Middle or maximum, of Gegenschein tolerably well defined by sketch or descriptions.
p Gegenschein only partly detached from a known light region in its vicinity.
r Gegenschein appearing only as a reinforcement of a known light region.
d Observation unusually doubtful from faintness of object or haze.
g General confirmation of the preceding observation by independent estimate, but without details.

Remarks on observations of Gegenschein collected on p. 149.

Observers, A. Searle, C. C. Wendell. For abbreviations of remarks (entried in column "Observer"), see this page, above. Observations in brackets are not independent determinations of place, but general confirmations of the preceding observation, given without knowledge of that observation.

The observations are often extremely doubtful, but none can be considered very certain; those unusually doubtful are marked d as explained above. See original records for remarks in particular cases. The entries in ink in this record were never made until the season for observations was over. The places given are much often from Dien's Atlas (Berlin 1860).

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See p. 148 for remarks.

Observations of Gegenschein, including those on p. 66.

Date	Observer and remark.	Gegenschein α	Gegenschein δ	Sun α	Sun δ
1878 Feb. 27	S. m	10h 40m	+13°	22h 44m	−8.0°
		160.0		161.0	
1881 Feb. 19	S. pd	10 4	+14	22 15	−10.9
		151.0		153.8	
23	S. cm	10 0	+14	22 30	−9.4
23	W. g	[10 0]	[+14]	157.5	
		150.0			
24	S. cm	10 16	+14	22 34	−9.0
		154.0		158.5	
25	S. m	10 20	+16	22 38	−8.6
25	W. m	10 28	+17	159.5	
		157.0			
Mar. 24	S. cm	12 28	0	0 17	+1.9
		187.0		184½	
24	W. m	12 28	+1		
		187.0			
28	S. cmd	12 40	−2	0 31	+3½
		190.0		187.8	
28	W. m	12 36	−1		
		189.0			
April 3	S. m	12 56	−4	0 54	+5.7
3	W. g	[12 56]	[−4]	193.5	
		194.0			
18	S. md	13 40	−12½	1 49	+11.3
		205.0		207½	
21	W. m	14 0	−7.0	2 0	+12.2
		210.0		210.0	
30	S. md	14 36	−16	2 34	+15.1
		219.0		218.5	
30	W. m	14 40	−13.5		
		220.0			
May 2	S. m	14 42	−16	2 41 5	+15.7
		220.5		220.4	
2	W. m	14 44	−14		
3	S. md	14 48	−16.5	2 45.5	+16.0
		222.0		221.4	
Aug. 25	S. rd	22 46	−8	10 20	+10.4
		341.5		335.0	
Sept. 30	S. v	0 40	+1	12 30	−3.2
		10.0		7.5	
1882 Feb. 14	S. cp	10 3	+16	21 54	−12.7
		150.8		148.5	
17	S. p	10 15	+17.5	22 6	−11.6
		153.8		151.5	
19	S. m	10 12	+13	22 14	−11.9
		153.0		153.5	
Mar. 11	S. rd	11 22	+3.5	23 29	−3.3
		170.5		172.2	
13	S. rd	11 22	+3.5	23 36	−2.6
		170.5		174.0	
14	S. pd	11 32	+3	23 40	−2.2
		173.0		175.0	
17	S. cp	11 44	+2.5	23 51	−1.4

Date	Observer and remark	Gegenschein α	Gegenschein δ	Sun α	Sun δ
1882 Mar. 19	S. cm	12h 2m	+1°	23h 58m	−0.2°
		180.5		179.5	
22	S. cm	12 10	−3	0 9	+1.0
		182.5		182.2	
April 8	S. cm	13 10	−7.5	1 11	+7.5
		197.5		197.8	
12	S. m	13 48	−10	1 26	+9.0
		207.0		201.5	
15	S. m	14 7	−10	1 37	+10.1
		211.8		204.2	
17	S. md	14 16	−11.5	1 44	+10.8
		214.0		206.0	
18	S. md	14 24	−12.5	1 48	+11.2
		216.0		207.0	

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March 1882.

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.
1	9	30.083	39.0	39.7	34.7	39.0	41.3	39.3	0 5/8	0.033	1 SE	10 P; a little rain.
2	9½	29.760	44.5	44.6	38.8	44.0	51.0	44.5	13 1/4	1.169	2 N	10 P; raining
3	9	29.742	41.1	40.9	35.6	40.3	46.5	40.8	2 1/4	0.199	0 calm	7 P 7m →
4	10	29.520	39.3	38.3	35.9	38.0	44.0	38.2	0		3 NW	2 Rs 7m
5	9	30.062	37.5	37.3	32.0	36.9	39.2	37.3	0		1 N	0
6	9	29.844	41.1	42.2	36.3	41.3	43.7	41.8	0 3/8	0.033	2 S	10 P
7	9¼	29.998	40.6	40.7	35.8	40.2	43.9	40.8	1 1/8	0.099	3 NW	5 Pm M 7m ↘
8	9½	30.569	29.4	23.5	19.7	23.2	41.2	24.3	0		2 N	0
9	9½	30.424	32.8	33.3	19.6	32.7	33.0	33.0	0		1 S	10 P
10	9½	29.448	36.7	36.7	32.2	36.1	38.3	36.2	6 5/8	0.585	0 calm	10 P fog
11	9½	30.007	36.3	34.7	28.2	34.3	48.3	35.0	0 1/8	0.011	2 N	3 M 7m ↘ Rs
12	9½	29.980	36.8	37.1	29.1	36.5	39.8	37.2	0		2 SW	10 P 7m → 7m ↗
13	9½	29.436	39.0	37.2	34.5	37.0	40.1	37.5	1	0.088	2 W	7 P Rs 7m ↗
14	9½	29.798	29.0	23.6	20.0	23.0	40.9	24.2	0		3 NW	5 P 7m →
15	9¼	30.267	25.3	23.2	14.4	23.0	28.1	24.0	0		1 N	0
16	9¾	30.200	32.0	33.0	22.2	32.4	33.3	33.0	0		2 E	10 Rm 7m ←
17	9½	30.277	32.9	31.3	25.3	31.0	34.7	31.4	0 1/2	0.022	2 NE	1 7m ↓
18	9¾	30.325	29.2	25.3	22.9	25.0	35.6	25.6	0		3 NE	10 P; a little snow
19	10	29.945	33.6	35.6	24.9	34.9	35.0	35.0	0 3/8	0.033	1 S	10 Rm 7m ↗
20	9½	29.930	27.8	46.0	30.7	45.5	48.4	45.3	0		2 W	0
21	9¾	29.843	40.0	36.9	34.9	36.4	55.3	37.0	0		2 E	10 P
22	9¾	29.828	36.0	31.1	25.7	30.4	37.2	31.3	2	0.177	1 N	10 P; a few snow flakes
23	9	30.200	34.4	28.5	23.2	28.1	38.0	29.0	0 1/4	0.022	2 NW	0 7m
24	9½	29.773	37.6	40.7	28.0	40.1	40.3	40.2	0		2 SW	10 Rm 7m ↗
25	9½	30.212	29.1	20.1	15.6	19.6	42.2	21.2	0		2 NW	0
26	9½	30.308	29.8	30.4	15.4	29.9	30.0	30.0	0		1 SE	10 P
27	9¾	29.856	36.6	49.7	29.6	48.3	49.0	47.5	0 1/2	0.011	3 SW	10 P
28	9¼	29.533	45.8	43.8	43.2	43.2	54.2	43.8	1 5/8	0.148	2 NW	10 Pm; a little rain
29	9¼	30.198	35.4	34.9	23.9	34.5	45.1	35.0	0		1 E	4 P Rs 7m
30	9½	29.865	39.0	43.4	30.3	42.6	43.0	42.6	0		2 SW	10 P 7m → 7m ↗
31	9½	30.246	35.6	27.4	24.3	27.1	49.0	27.6	1 3/8	0.121	3 NW	3 7m →
	9.4	29.477 / 29.983 / 28.919 / 28.962	1103.2 / 35.6	1091.1 / 35.2	866.9 / 28.0	1074.6 / 35.8	1289.6 / 41.6	Max. at meteorological building	31 7/8	2.746 Rainfall	59.8	1976.4

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March 1882.

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	10	29.818	44.2	51.1	3 S	10 Rn; raining	10	Cloudy	10	Cloudy	Obsc.
2	10½	29.860	44.2	39.9	2 N. W.	0	10½	Moonlight.	10½	Moonlight.	None
3	10¼	29.652	43.0	39.2	2 W	9 Rn 7m ↘	10¼	Moonlight and clouds	10¼	Moonlight and clouds	None
4	8¾	29.761	39.1	37.2	3 NW	3 PRs 7m	8¾	Moonlight and clouds	8¾	Moonlight and clouds	None
5											Obsc
6											Obsc.
7	11½	30.384	34.2	22.3	2 NW	0	7¾	Conspicuous in Belt	11¼	Moonlight	None
8	8¾	30.576	37.5	25.9	0 SE	0	8¾	Distinct	8¾	Double arch	Aurora
9											Obsc.
10											Obsc.
11	8½	30.082	38.6	32.7	1 SW	3 P haze	8½	Visible; haze	8½	None; clouds	None
12											None
13	8½	29.518	38.0	27.3	4 NW	0	8½	Distinct	8½	None	None
14	8½	30.072	29.8	19.5	3 NW	0	8½	Distinct; conspicuous earlier	8½	Dark arch and streamers	Aurora
15	8¾	30.249	34.9	25.2	1 SE	3 haze	8¾	Suspected in haze	8¾	None; haze	None
16											Obsc.
17	8¾	30.363	35.0	30.6	2 N	0	8¾	Conspicuous	8¾	None	None
18											Obsc.
19	8¼	29.953	41.8	40.3	1 W	0	8¼	Conspicuous	8¼	None	Aurora
20	8½	29.883	45.6	44.6	1 SW	5 P haze	8½	Suspected in haze	8½	None; haze	None
21											Obsc.
22	8½	29.950	38.7	31.1	1 S	6 P	8½	Moonlight and clouds	8½	Moonlight and clouds	None
23	9	30.122	39.2	30.8	1 S	0 P	9	Moonlight	9	Moonlight	None
24	8½	30.022	37.3	26.6	2 NW	0	8½	Suspected in moonlight	8½	Moonlight	None
25	8½	30.260	32.0	23.5	0 W	0	8½	Suspected in moonlight	8½	Moonlight	None
26											Obsc.
27											Obsc.
28	8½	29.959	41.7	33.9	2 N	0	8½	Moonlight	8½	Moonlight	None
29	8½	30.130	42.0	33.0	2 S	0	8½	Moonlight	8½	Moonlight	None
30	8¾	29.994	42.4	37.7	2 W	0	8¾	Moonlight	8¾	Moonlight	None
31	8¼	30.374	36.1	26.0	1 N	0	8¼	Moonlight	8¼	Moonlight	None

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March, 1882.

1, 10 P.M. Day and evening cloudy, warm, rainy.

2. 10 ± P.M. Possibly faint aurora as sky in north seems to look relatively a little brighter than elsewhere. No zodiacal light seen. W.
Became clear about 8 P.M. W.

3, 10¼ P.M. Day and evening mostly cloudy; a little sleet about 10 A.M.; rather clear for a time about 6½ P.M.; no aurora seen.

5, 9 A.M. Yesterday rather cloudy day and evening; no aurora seen.

6, 9 A.M. Yesterday clear at first, afternoon and evening cloudy with a little rain.

7, 9½ A.M. Yesterday cloudy day and evening, with a little rain.

7, 11½ P.M. Day rather cloudy; evening clear; no aurora seen.

8, 10¼ P.M. Day and evening clear, cool; aurora first noticed shortly before 8 P.M. as an irregular arch, sky very dark below; for a few minutes about 8 P.M. there were brilliant and lofty streamers, those furthest northwest being decidedly reddish; it was afterwards fainter, but very variable with an arch sometimes single, sometimes double, and occasional faint streamers; now nearly gone (moon not yet high enough to interfere much with aurora). Gegenschein looked for at times before moonrise, but sky too light from the horizon to the altitude of the lower part of Leo to decide anything. The space between λ and η Leonis and immediately preceding λ Leonis did not appear brighter than that near β and δ Leonis, and appeared fainter than the band between θ Leonis and β Virginis.

10, 9½ A.M. Yesterday cloudy day and evening, with a little snow and afterwards rain.

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11, 9½ A.M. Yesterday cloudy with a little rain, and ~~snow~~ in the following night some snowflakes; rather clear in the afternoon at times, but cloudy in the evening.

11, 11 P.M. Day partly cloudy, evening mostly rather clear but hazy. No aurora seen. Gegenschein not seen; bands seen as usual from Coma Berenices through β Virginis to σ Leonis, and perhaps a little preceding β Virginis it was rather bright; but this is doubtful.

Place of Sun
$23^h\ 29^m$
$-3°\ 19'$

τ Leonis
$11^h\ 22^m\ +3°\ 30'$

13, 9½ A.M. Yesterday cloudy, with a little rain after noon. Rather clear for a time about 10 P.M.; no aurora seen; too hazy for observation of Gegenschein.

13, 11 P.M. Day rather cloudy, with a few snowflakes; evening clear, with strong wind; no aurora seen; Gegenschein looked for without any decided result; suspected, about τ Leonis, as on March 11; but the number of pretty bright stars in that region makes it difficult to judge.

Place of Sun
$23^h\ 36^m$
$-2°\ 34'$

τ Leonis
$11^h\ 22^m\ +3°\ 30'$

14, 11 P.M. Day clear, cold, windy; wind falling after 9 P.M.; aurora suspected at 8 P.M., rather noticeable at 8½ P.M., with irregular double arch and streamers; afterwards subsiding into a low faint arch; little now visible. Gegenschein not seen except about as yesterday. The light seems to extend about ⅔ of the way from β to γ Virginis. Bands in Leo and Hydra well seen as usual.

Gegenschein perhaps
$11^h\ 32^m$
$+8°$

Place of Sun
$23^h\ 40^m$
$-2°\ 10'$

15, 10¾ P.M. Day mostly clear and chilly, with some east wind; evening hazy, haze increasing and afterwards diminishing; too hazy for observation of Gegenschein; no aurora seen.

17, 9½ A.M. Yesterday cloudy day and evening, with a little snow

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March 1882.

17, 12¼ P.M. Temperature about 33; bulb of No. 4 immersed in mixture of snow and water as on Feb. 21 reads 32.3 soon afterwards.

17, 1 P.M. Temperature about 35; No. 4 still standing at 32.3 as in 1879 and on Feb. 21, 1882.

17, 10¾ P.M. Day and evening clear and rather cold. No aurora seen. Gegenschein looked for; after long looking, it seemed very probable that the light about β Virginis extended farther towards η than on March 14. The whole space between β and η looked brighter than that between η and γ. But if any part of this light was due to Gegenschein it could not be distinguished with certainty from the light of the band from Coma Berenices to β Virginis.

Gegenschein perhaps about β Virg., say 11h 44m, +2° 30'
Place of Sun 23h 51m, −1° 22'

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

19, 11 P.M. Day at first cloudy, afternoon and evening clear; aurora first noticed about 9¼ P.M. as a low faint arch; streamers appeared soon after and still show themselves, pretty bright at times. Gegenschein looked for; it certainly seems tonight as if there was relatively less light near τ Leonis and more near η Virginis than on March 13. Assuming the parma of Gegenschein, its brightest part would now be about ⅔ of the way from β to η Virginis (where its border was March 14).

Gegenschein 24h 2m, +1°
Place of Sun 23h 58m, −0° 10'

21, 9¾ A.M. Yesterday clear and warm; evening partly cloudy with much haze; no aurora seen.

22, 9¾ A.M. Yesterday cloudy and chilly day and evening, with a little snow.

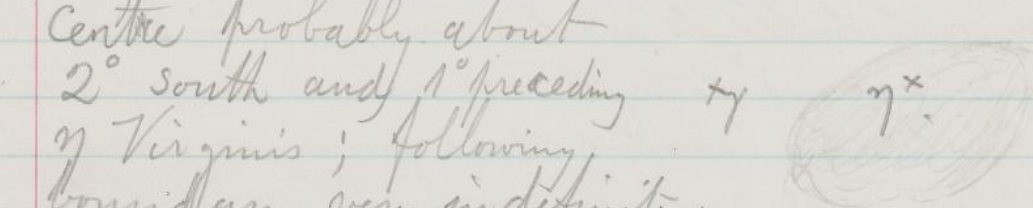
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March 1882.

22, 10⅔ P.M. Day cloudy with a little snow, partly clear at times; evening partly clear with frequent clouds; pretty clear after 10 P.M. but somewhat hazy; no aurora seen; perhaps too hazy for any ~~for any~~ observation of Gegenschein, but band between ο Leonis and Coma Berenices visible although the Milky Way is faint; ~~and~~ much looking confirms an impression at first suggested that the sky near β Virginis is now relatively darker than on former occasions in this situation; if Gegenschein is present, it may be sketched thus:

Gegenschein
Aug 12h 10m
− 3°
Place of Sun
0h 9m
+ 1°



The S edge of the band from ο Leonis seems to pass about 2° from β Virginis on the preceding side, in its course towards Coma Berenices.

22, 11 P.M. Again overcast; stars invisible.

23, 10½ P.M. Day mostly clear and cool; occasional thin clouds during the evening; no aurora seen.

24, 11 P.M. Day mostly cloudy and chilly; evening clear; no aurora seen; Zodiacal light suspected at 8½ P.M.; the vertical below the moon not light as February 24 and 27; light in the zodiac as usual and in the usual form, if seen at all.

25, 11 P.M. Day and evening clear, rather cold; no aurora seen; Zodiacal light apparently visible in moonlight about 8½ P.M. as yesterday; the Milky Way was also perceptible, so that it is possible that the Zodiacal light may have actually been seen

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March 1882.

27, 9¾ A.M. Yesterday cloudy day and evening, with a little snow.
28, 9¼ A.M. Yesterday cloudy day and evening, with a little rain.
28, 10¾ P.M. Day at first cloudy, afternoon and evening clear; no aurora seen.
29, 11 P.M. Day and evening clear, cool; no aurora seen.
30, 10¾ P.M. Day at first cloudy and rather warm, with some rain; afternoon and evening clear, becoming cool; no aurora seen.
31, 11 P.M. Day and evening clear, cold; no aurora seen.

Report to Signal Service sent April 1, 1882.

Aurora regularly looked for on clear evenings. Mar. 2, at 10h 30m P.M. possibly faint aurora, as sky in the north seems to look relatively a little brighter than elsewhere. Mar. 8, aurora first noticed shortly before 8h P.M., as an irregular arch, sky very dark below; for a few minutes about 8h P.M. there were brilliant and lofty streamers, those farthest northwest being decidedly reddish; it was afterwards fainter, but very variable, with an arch, sometimes single, sometimes double, and occasional faint streamers; at 10h 15m P.M. nearly gone. Mar. 14, aurora suspected at 8h P.M., rather noticeable at 8h 30m P.M., with irregular double arch and streamers; afterwards subsiding into a low faint arch; at 11h P.M. little visible. Mar. 19 aurora first noticed at 9h 15m P.M., as a low faint arch; streamers appeared soon after and at 11h P.M. still showed themselves at times pretty bright.

Zodiacal light suspected Mar. 15, 20, 24, 25; conspicuous in Boston, Mar. 7; distinct Mar. 8, 13, 14; visible, Mar. 11; also conspicuous on Mar. 17, 19. On Mar. 24, zodiacal light suspected at 8h 30m P.M.; the vertical below the moon not light; ~~the light, if~~ seen at all, was ~~it~~ in the zodiac as usual and in the usual form, ~~if seen at all~~. Mar. 25, zodiacal light apparently visible in moonlight about 8h 30m P.M. as yesterday; as the Milky Way was also ~~very~~ visible ~~it is hard to tell~~ that zodiacal

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light was actually seen. On other evenings observations hindered by moonlight, haze, or clouds.

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April 1882.

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 3/4	30.398	35.8	33.6	17.6	33.1	33.0	33.0	0		2 S	10 Pm 7m ↗	1
2	9 1/2	29.760	39.3	50.2	33.0	48.9	49.5	48.2	0 1/8	0.011	2 SW	10 Pm	2
3	8 3/4	30.442	40.0	35.4	29.8	35.0	65.8	35.7	0		1 NE	10 Pm	3
4	8 3/4	30.219	38.0	38.0	27.8	37.5	38.7	38.2	0		2 SW	0 Rs 7m	4
5	9	30.272	43.8	39.5	37.3	39.0	56.5	39.8	0 3/8	0.033	2 NE	9 Pm	5
6	9	30.518	38.0	37.1	24.7	36.7	41.7	37.3	0		1 E	6 M 7m ↙	6
7	9 1/2	30.090	40.0	36.2	33.1	35.9	41.3	36.6	0 1/2	0.044	1 S	10 Pm	7
8	9 1/2	30.081	41.8	48.0	35.8	47.2	47.6	47.3	0 1/8	0.011	2 N	3 M 7m ↘	8
9	10 1/4	29.884	42.8	43.5	31.3	42.8	52.4	48.2	0		1 E	3 M 7m	9
10	9 1/2	29.722	39.3	30.2	28.1	29.9	48.6	30.8	0 3/8	0.033	2 NE	10 P; snowing	10
11	9 1/2	29.728	37.2	34.7	27.1	34.2	34.6	34.8	0 1/8	0.011	1 NW	3 M 7m	11
12	9 1/2	29.773	36.8	32.5	25.4	32.1	41.5	33.0	0		2 NW	9 Pm M 7m	12
13	9 1/2	29.668	41.2	42.9	31.2	42.2	42.6	42.6	0		3 W	2 M 7m	13
14	9 1/4	29.887	42.8	42.4	38.1	41.8	48.9	42.3	0		1 N	10 Pm	14
15	9 1/2	29.958	41.6	41.1	30.8	40.9	53.0	41.3	0		1 SW	0 7m	15
16	9 1/2	29.912	42.2	46.8	33.1	46.1	50.3	46.3	0		2 N	0	16
17	9 1/4	29.900	45.0	53.5	37.3	52.0	56.4	52.7	0		1 W	0	17
18	9 1/2	29.958	49.0	53.2	43.0	52.3	62.1	52.7	0		1 SW	1 P 7m haze	18
19	10 1/2	29.920	45.9	47.3	33.2	46.7	62.8	47.1	0		2 E	2 7m haze	19
20	9 1/2	29.249	49.1	51.4	40.3	50.3	56.8	50.6	8 1/2	0.750	1 S	10 Pm	20
21	9 1/2	29.382	49.2	48.3	42.3	47.9	62.0	48.2	0		1 SW	9 Pm M 7m →	21
22	9 1/4	29.750	45.4	43.2	36.6	42.7	51.4	43.0	0 1/8	0.011	2 NW	9 Pm M 7m ↘	22
23	10	29.742	41.7	38.7	31.2	38.1	47.1	38.8	0		2 NW	7 Pm M 7m ↘	23
24	9 1/2	29.957	39.6	38.3	27.3	37.7	45.5	38.2	0		2 N	7 M 7m ↘	24
25	9 3/4	30.168	40.0	42.3	29.4	41.8	46.3	42.0	0		1 SE	0 M 7m	25
26	9	30.168	42.8	43.2	32.9	42.7	52.5	43.0	0		2 W	1 7m →	26
27	9 1/2	29.950	45.0	38.6	38.1	38.1	56.3	39.0	1 1/2	0.132	3 E	10 Pm ; raining	27
28	9 1/2	29.990	40.3	39.3	32.9	38.9	39.0	39.0	13 5/8	1.202	2 N	10 Pm	28
29	9 1/2	29.948	45.1	51.9	38.7	51.2	51.7	51.3	0 1/4	0.022	2 W	1 M 7m →	29
30	9 1/2	29.900	47.8	50.0	41.1	49.1	61.0	49.7	0		2 NE	9 Pm 7m ↗	30
	9.5	898.294 29.943 −.037 29.906	1266.5 42.2	1271.3 42.4	988.5 33.0	1252.8 41.4	1496.9 49.9	Barometer inside building	25 5/8	2.260 Rainfall for month 2.26 inches	50 1.7	171 5.7	

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April 1882.

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	8	29.962	47.2	46.1	3 N	0 Rs	8	Moonlight	8	Moonlight	None.
3	9½	30.477	41.0	29.8	1 SE	0	9½	Moonlight	9½	Moonlight	None
4											Obsc.
5	8¼	30.416	44.4	33.1	1 S	0	8¼	Distinct	8¼	None	None
6											Obsc.
7	8¼	29.892	42.8	39.3	0 calm	2 haze; fog	8¼	Visible	8¼	None	None
8	8¼	30.074	48.0	40.1	0 calm	0	8¼	Distinct	8¼	None	None
9											Obsc.
10											Obsc.
11											Obsc.
12	8¼	29.750	41.2	33.3	2 W	0 Pm	8¼	Distinct	8¼	None	None
13											Obsc.
14											Obsc.
15	9½	29.920	47.1	40.5	1 NW	0 P Rs	9½	Visible	9½	None	Aurora
16	8½	29.900	49.6	48.0	1 W	0	8½	Perceptible	8½	Extensive	Aurora
17	8¼	29.888	55.3	54.6	1 SW	0 haze	8¼	Visible	8¼	None	None
18	8¼	29.974	51.2	39.6	1 N	1 P 7m haze	8¼	Visible	8¼	None	None
19	9	29.450	51.3	52.6	2 S	10 P; raining	9	Cloudy	9	Cloudy	Obsc.
20	10½	29.368	53.7	46.9	0 calm	1 haze	9	Moonlight	10½	Broken arch	Aurora
21	9½	29.612	49.7	41.8	2 W	5 P Rs	9½	Moonlight	9½	Moonlight and clouds	Susp.
22	11¼	29.833	45.7	37.3	2 W	5 P 7m	11¼	Moonlight	11¼	None; some clouds	None
23	9	29.852	45.5	33.3	3 N	0 Rs	9	Suspected in moonlight	9	Suspected	Aurora
24	8¼	30.089	42.9	36.4	1 NW	0 P	8¼	Moonlight	8¼	Moonlight	None.
25	8½	30.152	47.9	42.9	2 S	5 Pm 7m ↘	8½	Moonlight	8½	Moonlight and clouds	None
26											Obsc.
27											Obsc.
28											Obsc.
29											Obsc.
30	9¾	29.935	51.1	41.9	0 calm	1 fog	9¾	Moonlight	9¾	Moonlight	None.

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April 1882.

2, 9½ A.M. Yesterday cloudy and chilly with a little rain in the evening.
2, 10¼ P.M. Day warm and cloudy with a little rain, clear towards night; evening rather clear, with passing clouds; no aurora seen.
3, 10½ P.M. Day cloudy at first, afterwards clear and cool; no aurora seen.
5, 9 A.M. Yesterday at first clear and rather cold; afterwards cloudy and warmer; evening cloudy, with a little rain.
5, 11 P.M. Day at first cloudy, soon clear and cool; no aurora seen.
7, 9½ A.M. Yesterday mostly cloudy; evening cloudy.
7, 10½ P.M. Day cloudy till towards night, then clear till 8½ P.M., afterwards thick fog and clouds; no aurora seen.
8, 11½ P.M. Day clear, cool; evening clear with a little haze, and some clouds low in the north; centre of
Gegenschein $13^h 10^m, -7° 30'$
Place of Sun $1^h 11^m, +7° 32'$
Gegenschein suspected about half way between 2 and θ Virginis; sky somewhat light below η Virginis and between that place and 2 Virginis. No aurora seen. Region near η Virginis not as on March 22. Corona certainly darker than sky above and to the left in Virgo.
10, 9½ A.M. Yesterday mostly cloudy and cool; morning somewhat clear; evening cloudy, with a little rain.
11, 9½ A.M. Yesterday cloudy day and evening, with a little snow early.
12, 9½ A.M. Yesterday somewhat cloudy; evening cloudy.
12, 11 P.M. Day mostly cloudy and rather cold, with slight snow squalls in the afternoon; evening clear; no aurora seen. Light below η Virginis to 2 Virginis as on April 8; Corona dark, so also region following δ Virginis. Less appearance of Gegenschein between 2 and θ Virginis; the place

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Gegenschein say
$13^h 48^m - 10°$
Place of Sun
~~$23^h 50^m + 1°$~~
$1^h 26^m, +9°$

which seems lightest in that region is now about $\frac{2}{3}$ of the way from α to κ Virginis.

14, 9¼ P.M. Yesterday rather cloudy; evening cloudy.

15, 9½ P.M. Yesterday cloudy day and evening.

15, 11 P.M. Day clear at first, afternoon rather cloudy; evening cloudy till about 9 P.M. then mostly clear; clouds low in the north, with auroral streamers from behind them now; a white cloud at 9½ P.M. in the northeast may possibly have been auroral. Sky certainly lighter above a line from α to β Virginis than below, and again darker in neighborhood of δ Virginis; Gegenschein somewhat suspected with centre about κ Virginis.

κ Virg.
$14^h 7^m, -10°$
Place of Sun
~~$23^h 46^m + 1°$~~
$1^h 37^m, +10°$

16, 10¾ P.M. Day and evening clear, rather warm; aurora seen before 8 P.M. by Professor Pickering; bright and extensive about 8½ P.M. with lofty arch, detached fragments reaching altitude of about 60°, and some streamers; at about 8¾ P.M. aurora very brilliant for some minutes, with bright narrow streamers, and diffused red light in places, especially distinct in Perseus; color decided, not very bright. Afterwards much fainter and more broken. After 10 P.M. again increasing; at 10½ P.M. upper edge of arch passing through Capella and Rigel. The aurora bright enough to cast a vague shadow on the ground, and a distinct one on a wall from any object close to it. Now fainter again. Sky not very dark below at any time. Aurora so extensive early in the evening as to hinder view of zodiacal light, and too bright for good observation of Gegenschein later in the evening.

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April 1882.

17, 9¼ P.M. Aurora last night increased after 10¾ P.M., and shortly before midnight had formed a corona 2° or 3° preceding Arcturus, with bright flashes in the south to within 20° of the horizon, and [illegible] with diffused light over the northern sky, with little movement. Some red light in the southwest at the same time.

17, 11¼ P.M. Day clear and warm; no aurora seen; rather hazy evening, but band below η Virginis seen as before; Gegenschein suspected, with centre about ⅓ of the way from κ Virginis to α Librae, but observation very doubtful; sky whitish as high as β Librae.

Gegenschein, say 14h 16m − 11° 30′
Place of Sun 1h 44m; +10° 47′

18, 11¾ P.M. Day mostly rather clear, cloudy part of the afternoon; evening rather hazy; no aurora seen. Too much haze to see faint bands about Virgo distinctly; but light near κ Virginis seems to be farther east than yesterday; centre perhaps half way from κ Virginis to α Librae.

Gegenschein, say 14h 24m, −12° 30′
Place of Sun 1h 48m +11° 10′

19, 9 P.M. Day at first rather clear; clouds increasing after noon; rain beginning about 5 P.M.

20, 10½ P.M. Day mostly cloudy, rather warm; clear after 7¾ P.M.; aurora visible about 9½ P.M., now somewhat brighter; irregular and varying arch, over clouds.

21, 10¼ P.M. Day cloudy with occasional slight showers; evening mostly cloudy, partly clear at times. Some light now among clouds in the north; possibly auroral, but moon not yet set.

22, 11¼ P.M. Day cloudy, rather cool; evening mostly cloudy, partly clear at times; no aurora seen.

23, 11 P.M. Day clear at times, often cloudy; cool; evening rather clear with occasional clouds; aurora suspected early, now distinct; narrow bright arch over clouds;

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April 1882.

24, 11¼ P.M. Day partly cloudy, cool; evening rather clear, with occasional clouds; no aurora seen.

25, 10 P.M. Day mostly cloudy; cool; evening rather clear after 8 P.M., but with frequent clouds moving slowly from the north; no aurora seen.

27, 9½ A.M. Yesterday mostly rather cloudy; evening cloudy, moon somewhat visible.

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

29, 9½ A.M. Yesterday cloudy and cool day and evening; partly clear for a time after sunset.

30, 9½ A.M. Yesterday cloudy day and evening; lunar halo, pretty distinct about 8 P.M.

30, 11 P.M. Day cloudy at first, afterwards mostly clear; evening slightly foggy; no aurora seen.

Report to Signal Service sent May 1, 1882.

Aurora regularly looked for on clear evenings. Apr. 15, at 11h P.M. auroral streamers from behind clouds low in the north; a white cloud at 9h 30m P.M., in the N.E., may possibly have been aurora. Apr. 16, aurora seen before 8h P.M., bright and extensive about 8h 30m P.M., with lofty arch, detached fragments reaching an altitude of 60° about, and some streamers; about 8h 45m P.M. aurora ~~very~~ very brilliant for some minutes, with bright narrow streamers and diffused red light in places, especially distinct in Perseus; color decided, not very bright. Afterwards much fainter and much broken. After 10h P.M. again increasing; at 10h 30m P.M. upper edge of arch passing through Capella and Vega. The aurora bright enough to cast a vague shadow on the ground, and a distinct one on a wall from any object close to it; about 10h 45m P.M. fainter again. Sky not very ~~dark~~ dark below at any time. Aurora so extensive early in the evening as to hinder view of zodiacal light, which was perceptible, however, [illegible] after 10h 45m P.M. aurora increased and shortly before midnight had formed a corona 2° or 3° preceding Arcturus, with bright flashes in the zenith to within 20° of the horizon, and with diffused light over the northern sky, with little movement. Some red light in the south-east at the same time.

Apr. 20, aurora visible about 9h 30m P.M.; at 10h 30m P.M. somewhat brighter, irregular and varying arch over clouds. Apr. 21, at 10h 45m P.M., some light among clouds in north; possibly aurora, moon just set. Apr. 23, Aurora suspected early in evening; at 11h P.M. distinct; narrow bright arch over clouds.

Zodiacal light distinct Apr. 5, 8, 12; visible Apr. 7, 15, 17, 18; perceptible Apr. 16; suspected in moonlight Apr. 23. Observations on other evenings hindered by moonlight or clouds.

Lunar halo, Apr. 29, pretty distinct about 8h P.M.

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May 1882.

Date	Time AM	Barometer	Attached Thermometer	No. 4	Minimum before and after setting		Maximum before and after setting		Gauge	Rainfall in Inches	Wind	Clouds	Date
1	9	29.983	46.4	52.0	37.9	51.7	53.7	51.5	0		2 W	0 M 7m	1
2	9	29.802	49.8	57.4	41.1	56.6	61.2	56.2	0		2 S	8 P Rs 7m ↗	2
3	9½	30.153	43.0	43.6	30.7	43.0	61.8	43.3	0½	0.044	2 SW	5 Rs R 7m →	3
4	9½	29.770	49.1	58.8	40.3	57.4	58.0	56.5	0		2 SW	9 P 7m →	4
5	9¼	29.874	50.0	46.5	39.8	45.9	68.5	47.0	0		2 SE	1 M 7m haze	5
6	9	30.102	46.0	45.2	33.6	44.7	49.9	45.0	0		1 NW	1 Rs haze	6
7	9¾	30.350	47.2	50.0	36.7	49.2	53.3	50.0	0		2 NE	4 Rs R 7m	7
8	9½	30.344	48.0	54.0	35.3	53.0	53.5	53.0	0		2 SW	2 Rs	8
9	9½	29.750	52.5	57.1	46.9	56.2	67.1	56.3	4¼	0.375	2 NW	10 P 7m	9
10	9	29.935	54.0	53.4	45.2	52.7	70.0	53.3	0		1 E	0 Rs	10
11	9½	30.103	51.0	39.6	38.2	39.1	57.2	40.4	0¾	0.066	3 E	10 Rm; raining	11
12	9	30.118	47.7	41.1	39.0	40.7	44.5	41.6	0⅝	0.055	3 NE	10 Rm; raining	12
13	9½	29.890	45.8	43.4	38.2	42.8	43.2	43.1	4⅛	0.364	3 NE	10 Rm; fine rain	13
14	9¼	29.603	46.1	44.9	40.8	44.2	44.8	44.8	2¾	0.243	2 NE	10 Rm; fine rain	14
15	9¼	29.626	45.2	39.1	38.1	38.2	47.9	39.0	14¾	1.302	3 NE	10 Rm; raining	15
16	9¼	30.006	43.1	45.9	33.3	45.3	45.5	45.5	0½	0.044	1 NW	1 Rs R 7m	16
17	9¼	30.121	49.4	49.3	37.8	48.7	57.3	49.4	0		3 NE	7 R Rs	17
18	9½	30.434	49.6	45.0	41.7	44.2	51.4	45.0	0		3 NE	10 Rm 7m	18
19	9½	30.290	45.2	42.0	35.2	41.3	47.2	42.2	2	0.177	2 NE	10 Rm	19
20	9½	29.948	47.3	46.5	41.2	45.7	46.1	46.1	0¼	0.022	1 SW	10 Rm; raining	20
21	9½	29.822	49.3	50.0	45.5	49.2	49.7	49.6	11⅞	1.048	1 SW	10 Rm; raining	21
22	9¼	30.095	52.8	59.5	45.6	58.4	64.9	58.3	0⅛	0.011	1 E	7 P haze	22
23	9	30.003	53.1	44.7	44.0	44.0	59.2	46.2	2½	0.221	3 E	10 Rm; raining	23
24	9½	30.050	51.2	55.0	35.2	54.3	54.6	54.5	4½	0.397	2 NW	0 M 7m	24
25	9½	30.093	54.8	59.9	45.3	58.5	60.8	58.7	0		1 SW	10 P	25
26	9½	30.113	53.0	53.9	37.9	53.1	60.2	54.0	0		1 SW	0 7m	26
27	9½	30.018	55.0	59.1	44.5	58.1	64.9	58.1	1¼	0.110	2 SW	7 P Rs 7m	27
28	9½	29.779	59.5	67.6	54.2	66.2	72.4	65.8	0⅜	0.033	2 SW	9 Rm 7m ↗	28
29	9½	29.648	61.1	59.0	55.2	58.2	80.0	58.8	5	0.441	3 N	9 Rm M 7m ↙	29
30	9¾	29.927	57.4	61.2	45.1	60.7	66.7	60.5	0		1 SW	0 Rs 7m	30
31	9¾	29.862	59.8	65.9	49.5	67.8	70.4	67.0	0		2 SW	0 P Rs	31
	9.4	929.612 / 29.988 / 29.927	1563.4 / 50.4	1593.6 / 51.4	1273.0 / 41.1	1569.6 / 50.6	1785.9 / 57.6	Max. set inside building	56 1/8	4.953 Rainfall for month	61 / 2.0	190 / 6.1	

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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	8½	29.962	54.0	54.3	2 SW	5 M 7m ∧	8½	Moonlight	8½	Moonlight and clouds	None
2	11¾	30.140	45.3	34.9	2 W	0	11¾	Moonlight	11¾	Moonlight	None
3	8¼	29.969	52.3	48.4	1 SW	0 P	8¼	Moonlight	8¼	Moonlight	None
4	10	29.747	55.7	53.4	2 NE	5 P 7m haze	10	Moonlight and clouds	10	Moonlight and clouds	None
5	10¼	29.958	51.6	41.1	1 NW	0 haze	8½	Visible	10¼	Moonlight	None
6	8¾	30.142	52.0	43.9	2 SE	2 Rs haze	8¾	Visible	8¾	None	None
7	8¾	30.392	54.0	46.3	2 S	0 haze	8¾	Visible	8¾	None	None
8	9½	30.089	54.7	48.5	2 SW	10 P	9½	Cloudy	9½	Cloudy	Obsc.
9	8½	29.818	60.8	60.8	1 N	5 P haze	8½	Cloudy	8½	Nonj some clouds	None
10	10	29.962	57.2	49.7	2 SE	10 Pm	10	Cloudy	10	Cloudy	Obsc.
11											Obsc.
12	9	30.051	47.1	39.2	2 NE	10 P; raining	9	Cloudy	9	Cloudy	Obsc.
13	9	29.762	46.7	42.3	2 NE	10 P; a little rain	9	Cloudy	9	Cloudy	Obsc.
14	9	29.492	47.7	45.5	2 NE	10 P; raining	9	Cloudy	9	Cloudy	Obsc.
15	8½	29.945	45.4	39.9	2 NE	4 Pm 7m	8½	Twilight and clouds	8½	Twilight and clouds	None
16	9	29.991	53.9	46.0	2 S	9	9	Visible	9	None	None
17											Obsc.
18	10½	30.380	46.9	38.9	2 NE	10 Pm	10½	Cloudy	10½	Cloudy	Obsc.
19											Obsc.
20											Obsc.
21	11¼	29.936	55.0	48.4	0 calm	4 haze	11¼	Hazy	11¼	Hazy	None
22											Obsc.
23	8½	30.026	51.0	42.5	2 NW	0 Pm 7m	8½	Twilight	8½	Twilight and clouds	None.
24	10½	30.110	57.6	49.7	0 calm	1 Rs haze	10½	Moonlight	10½	Moonlight	None.
25	10½	30066	55.5	45.7	0 S	2 Pm 7m	10½	Moonlight	10½	Moonlight and clouds	None.
26	10½	30.053	58.9	49.0	2 SW	9 P Rs	10½	Moonlight and clouds	10½	Moonlight and clouds	Aurora
27	9¼	29.970	62.5	58.0	2 SW	10 Pm 7m 11	9¼	Cloudy	9¼	Cloudy	Obsc.
28											Obsc.
29	11	29.886	61.7	53.0	1 NW	0	11	Moonlight	11	Moonlight	None
30	9¾	29.890	64.8	58.0	2 S	1 P Rs	9¾	Moonlight	9¾	Moonlight	None.
31	10¾	29.761	65.0	60.9	3 S	5 P Rs	10¾	Moonlight and clouds	10¾	Moonlight and clouds	None.

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April May 1882.

1, 9¾ P.M. Day rather warm and clear, with passing clouds; clouds frequent in the evening; no aurora seen.

2, 11¾ P.M. Day cloudy at first, with rain about noon; clear later; no aurora seen.

3, 10¾ P.M. Day and evening clear and rather warm; no aurora seen.

4, 10 P.M. Day warm and rather cloudy; evening cloudy at first, partly clear after 9 P.M.; no aurora seen.

5, 10¼ P.M. Day rather cool with some clouds; evening rather cloudy early, growing clear; no aurora seen.

6, 11½ P.M. Day cool with thin clouds; evening mostly clear; no aurora seen.

7, 11¼ P.M. Day clear and cool; east wind; evening mostly clear, with some faint clouds and haze; no aurora seen. Leo and Virgo have their usual appearance; the band between Corvus and Virgo pretty well marked, as in April.

8, 9½ P.M. Day rather clear and warm, with thin clouds increasing towards night; evening cloudy; a few stars visible.

9, 10 P.M. Day rather cloudy, with rain previous night; warm and clear later; evening hazy, with thin irregular clouds; no aurora seen.

10, 10 P.M. Day clear at first, afterwards rather cloudy; evening cloudy.

12, 9 A.M. Yesterday cloudy and cold day and evening, with a little rain.

12, 9 P.M. Day cloudy and cold, with some rain and sleet.

13, 9 P.M. Day cloudy and cool, with some rain.

14, 9 P.M. Day cloudy and cool, with frequent rain.

15, 10½ P.M. Day cloudy with some rain; evening mostly clear; no auroral seen; zodiacal light visible about 9¼ P.M.; appearance of Leo and Virgo as on May 7.

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16, 11¼ P.M. Day and evening clear; somewhat hazy; no aurora seen.
18, 9½ A.M. Yesterday cool with increasing clouds; evening cloudy.
18, 10½ P.M. Day cloudy and cold with some rain and enough sleety snow to collect half an inch thick in a few places.
20, 9½ A.M. Yesterday cloudy and cold day and evening.
21, 9½ A.M. Yesterday cloudy day and evening, with some rain.
21, 11¼ P.M. Day cloudy with a little rain, clears towards night; evening hazy; no aurora seen.
23, 9 A.M. Yesterday cloudy day and evening, with some rain.
23, 11 P.M. Day cool and cloudy with rain; evening clear after 8 P.M.; no aurora seen.
24, 10½ P.M. Day mostly clear and rather warm; evening rather clear with some haze and clouds; no aurora seen. Occasional imperfect lunar halos.
25, 10½ P.M. Day mostly cloudy, with some rain; evening rather clear, with occasional clouds; no aurora seen.
26, 10½ P.M. Day mostly clear and warm; evening rather clear with many thin clouds; lunar halo; ζ Virginis at 10¼ P.M. about 0¾ degrees outside of inner edge. Auroral light among clouds in the north about 10¼ P.M. pretty certainly seen.
27, 9¼ P.M. Day mostly clear and warm; clouds coming on after sunset, at first thin, now thick.
29, 9½ A.M. Yesterday rather cloudy and hot; evening cloudy, with a little rain.
29, 11 P.M. Day mostly clear, warm; evening clear; no aurora seen.
30, 9¾ P.M. Day clear and warm; evening pretty clear; some clouds; no aurora seen.
31, 10¾ P.M. Day warm and rather cloudy; evening rather cloudy, clouds thin and broken; occasional faint lunar halos; no aurora seen.

Cherry trees just past flowering; pear trees and early apple trees in blossom; many flower buds not yet open on most apple trees. The earth has trembled

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May 1882.

May 1868 in coldness and the lateness of the season; but the rainfall is much less this year.

Report to Signal Service sent June 2, 1882.

Aurora regularly looked for on clear evenings. May 26, auroral light pretty certainly seen about 10h 15m P.M. among clouds in the north.

Zodiacal light visible May 5, 6, 7, 15, 16. Observations on other evenings hindered by moonlight or clouds.

Lunar halos. May 24, occasional imperfect lunar halos. May 26, lunar halo. May 31, occasional faint lunar halos.

Blossoming of trees. Cherry trees just past flowering May 31; pear trees and early apple trees in blossom; many flower buds not yet open on most apple trees. The month has resembled May 1868 in coldness and the lateness of the season; but the rainfall is much less this year (4.95 inches to 7.32 inches in 1868).

1868 May.	Mean temperature from observations at 7 A.M., 2 P.M., 9 P.M.,		50.8
1882 "	" " " " " "	9.4 A.M.	51.4
1868 "	" reading of attached therm. (bar. N. 57)	at 10 A.M.	50.7
1882 "	" " " " " (bar. N. 68)	" 9.4 A.M.	50.4
1868 "	" " " min. therm. G. 2205	at 10 A.M.	43.3
1882 "	" " " " " " "	" 9.4 A.M.	41.1
1868 "	Lowest " " " " "	(May 8)	33.0
1882 "	" " " " " "	(May 3)	30.7
1868 "	Number of minima observed below 40		8
1882 "	" " " " " "		15
1868 "	Latest date of a minimum below 40		May 13.
1882 "	" " " " " "		May 26.

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June 1882.

Date	Time A.M.	Barometer	Attached Thermometer	No. 4	Minimum before	Minimum after	Maximum before	Maximum after	Gauge	Rainfall in inches	Wind	Clouds
1	9½	29.509	62.0	63.3	59.0	62.3	77.3	62.7	0 3/8	0.011	3 S	10 Pm
2	9¾	29.861	57.3	59.5	46.2	59.0	68.0	59.0	1 1/8	0.099	2 W	0
3	9½	29.934	60.4	67.1	52.3	65.6	70.0	65.5	0		1 S	10 Pm
4	9½	29.700	61.9	64.4	56.1	63.1	74.6	63.3	1 5/8	0.143	1 S	10 Pm
5	9¼	29.686	60.0	61.7	48.8	60.7	67.8	60.8	0 3/4	0.066	1 SW	10 Pm Fm
6	9¼	29.800	60.5	61.2	53.2	60.2	68.1	60.6	0		2 NE	8 Pm M Rm Fm
7	9¼	29.821	62.3	67.7	50.2	66.9	66.7	66.6	0		1 W	4 R Rs
8	9¼	29.761	67.0	75.9	59.1	74.7	79.3	74.2	0		2 W	2 M Fm Rs
9	9¼	29.682	66.5	71.8	58.1	70.6	82.7	70.3	0		1 SW	9 Pm Fm →
10	9½	29.898	63.8	65.2	50.4	64.0	79.4	64.1	0		1 S	10 Pm Fm →
11	9½	29.968	61.9	53.3	51.8	52.9	70.8	53.7	3 3/8	0.298	2 N	10 Pm
12	9½	30.217	60.0	59.2	48.1	58.5	63.7	59.0	0		2 NE	0 Fm
13	9½	30.244	59.1	64.8	45.0	63.9	63.6	63.4	0		1 S	2 haze Rs
14	9½	30.130	62.0	69.9	51.3	68.3	72.9	68.0	0		1 S	5 P haze
15	9¾	29.856	63.8	69.9	55.8	68.6	80.7	68.3	0		3 SW	7 P Rm Rs Fm
16	9¾	29.650	66.7	76.2	59.4	75.1	78.3	74.8	0		2 NW	9 Pm M Fm Fm →
17	9½	29.786	68.5	70.4	60.3	69.3	83.3	68.0	4 3/4	0.419	1 E	0 haze Rs
18	9½	29.748	67.2	65.2	58.0	64.3	71.2	65.0	0		1 E	10 P fog
19	9½	29.737	65.8	71.7	58.3	70.0	69.7	68.2	9 1/8	0.805	1 S	10 P
20	9¼	29.877	65.6	65.8	57.0	60.2	82.7	60.8	1 1/2	0.132	4 NW	0 Fm
21	9½	30.076	63.8	68.2	51.9	67.1	69.9	66.9	0		2 W	9 P
22	10¼	30.146	56.8	71.6	53.7	70.7	75.2	70.7	0		1 W	0 Rs
23	9¾	30.122	68.0	75.6	55.8	74.2	80.0	73.7	0		1 S	5 P Rs haze
24	10	30.010	73.4	80.4	67.5	79.7	81.2	79.4	0		0 calm	0 M Rs
25	9¾	29.737	75.5	81.2	70.0	80.1	90.9	79.7	0		2 W	9 Pm R Rs Fm →
26	9½	29.776	76.3	76.2	70.1	75.4	89.3	75.7	0		2 NW	3 R Rs Rm Fm
27	9½	29.898	73.2	72.2	63.1	71.2	85.9	71.7	0		3 NW	1 M Fm ↘
28	9½	29.872	71.1	75.2	59.2	74.1	78.6	74.0	0		2 SW	5 P Rs M Fm
29	9¾	29.846	70.4	68.9	61.2	68.0	81.6	68.3	0		3 NW	9 P Rs M Fm
30	9½	29.976	64.6	64.8	51.3	64.0	74.7	64.2	0		2 NW	1 P Rs R Fm
	9.5	896.324 29.877 −1.098 29.779	1955.4 65.2	2058.5 68.6	1688.2 56.1	2023.0 67.4	2278.1 75.9	Max. set inside building	22 3/8	1.973 Rainfall for month 1.97 inches	51 1.7	168 5.6

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June 1882.

	Time P.M.	Barometer	attached Thermometer	No 4.	Wind	Clouds	Time P.M.	Zodiacal Light	Time P.M.	Aurora	Light to Eastward
1	10¼	29.657	62.7	54.3	2 SW	0 Fm	10¼	Moonlight	10¼	Moonlight	None
2	9½	29.925	64.7	58.6	1 S.W.	9 Pm Fm	9½	Cloudy	9½	Cloudy	None
3											Obsc.
4											Obsc.
5	9¾	29.716	64.7	56.9	0 calm	1 P	9¾	Suspected	9¾	None	None
6	10½	29.822	63.7	54.8	1 SW	0 haze	10½	None	10½	None	None
7	9½	29.771	69.3	65.3	2 S	1 haze P	9½	Hazy	9½	None; hazy	None
8	10½	29.799	72.0	66.5	1 SW	9 Pm	10½	Cloudy	10½	Cloudy	Obsc.
9	9¾	29.832	70.6	64.0	1 NW	0 haze	9¾	Suspected	9¾	None	None
10											Obsc.
11											None
12	10¾	30.224	62.3	49.9	0 calm	0 haze Fm	10¾	None	10¾	None	None
13	9	30.196	67.4	60.7	1 S	1 P Rs haze	9	Twilight and clouds	9	Twilight and clouds	None
14	11	29.999	67.6	59.5	1 S	5 P haze	11	Cloudy	11	Cloudy	None
15											Obsc.
16	11¼	29.728	72.2	64.8	0 calm	0 haze	9	Twilight	11¼	None	None
17											None
18											Obsc.
19											Obsc.
20	9¾	30.029	67.9	59.1	0 calm	0 haze	9¾	Moonlight	9¾	Moonlight	None
21	10¼	30.060	70.3	64.7	1 W	0	10¼	Moonlight	10¼	Distinct streamers	Aurora
22	9½	30.129	73.7	68.6	0 calm	0	9½	Moonlight	9½	Moonlight	None
23											Obsc.
24											Obsc.
25	9¾	29.708	81.3	78.7	1 W	3 P Rs	9¾	Moonlight	9¾	Moonlight	None
26	11¼	29.823	78.5	67.8	0 calm	9 Pm Fm	11¼	Cloudy	11¼	Cloudy	None
27	11¼	29.922	73.3	66.1	1 NW	2 P Rs	11¼	Moonlight and clouds	11¼	Moonlight and clouds	None
28	9½	29.784	76.3	68.7	1 SW	8 Pm Fm	9½	Cloudy	9½	Moonlight	None
29	11	29.935	69.3	58.3	1 NW	0 N Rs Fm	11	Moonlight	11	Moonlight	None
30											Obsc.

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June 1882.

1, 10¼ P.M. Day cloudy and warm; with a little rain; clearing in the afternoon; evening clear; no aurora seen.

2, 9½ P.M. Day clear and warm; clouds coming on from the west after 8 P.M.; no aurora seen.

4, 9½ A.M. Yesterday cloudy and warm day and evening with a few drops of rain. Thunder shower this morning about 8 A.M.

5, 9¼ A.M. Yesterday cloudy day and evening with a little rain.

5, 11 P.M. Day warm and rather cloudy; evening pretty cloudy; no aurora seen.

6, 10¾ P.M. Day rather cloudy, becoming clearer towards night; thin clouds early in the evening; nearly clear later; no aurora seen; band from Coma Berenices to τ Leonis now pretty distinct; Corvus, although low darker than sky below γ Virginis; sky near δ Virginis darker again; there seems to be a "zodiacal band" below γ Virginis, nearly through α Virginis rather below than above, about ⅓ of the way from α Librae to γ Scorpii, and reaching to δ Scorpii. Great dark region conspicuous bounded roughly by line from α Urs. Min. to β Urs. Maj., α Can. Ven., ε Bootis, γ Drac., and α Urs. Min. again. No connection between Coma Berenices and Milky Way on this side of Lyra and Scorpius; this dark region interposes. Leo Minor may be brighter than Leo, as it has sometimes seemed to be; Leo too low now for comparison.

6, 11 P.M. Reexamined dark region after looking at last year's description, pp. 80, 84. Thought sky between α Urs. Maj. and α Can. Ven. a little light also between γ Drac. and α Serpentis.

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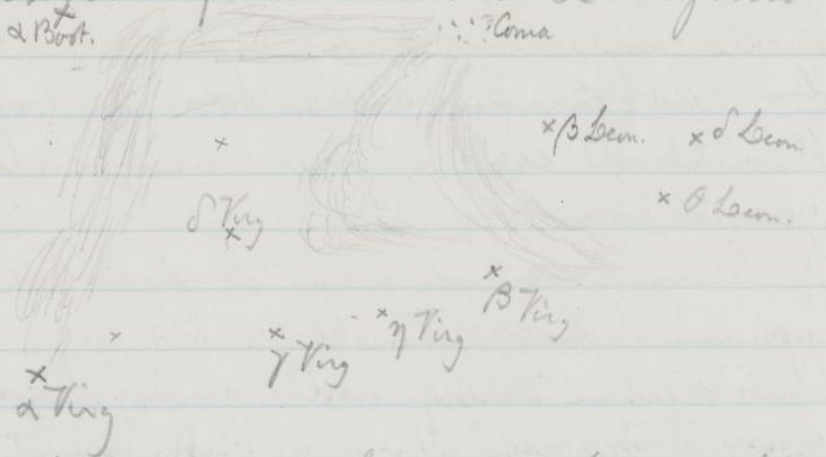
so that, on the whole, continued to draw rough boundary as before. But the boundary is very irregular, and there is little choice between the limits given last year and this.

7, 10¼ P.M. Day clear and warm; a few thin clouds; evening hazy with a few clouds; no aurora seen.

8, 10½ P.M. Day mostly clear, rather hot; clouds increasing towards night; evening cloudy; with lightning in the west; no thunder.

9, 9¾ P.M. Day cloudy at first, afterwards clear and warm; evening clear; "zodiacal band" of June 6 not distinct, but slightly suspected (rather above ζ Virginis than below). Band from Coma Berenices to τ Leonis perceptible; also bands from Coma Berenices to γ Virginis, and from neighborhood of α Bootis to ζ Virginis.

9, 10¼ P.M.



Light bands somewhat as above; the only one nearly certain is that from Coma towards τ Leonis, curving round between β Leonis and β Virginis; but there is some extension of it (or a separate band possibly) towards η and γ Virginis, but not reaching them. The band from small stars preceding α Bootis towards ζ Virginis appears tolerably certain.

11, 9½ A.M. Yesterday cloudy and rather warm day and evening, rain about 11 P.M.

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June 1882

12, 9½ A.M. Yesterday mostly cloudy and cool, partly clear towards night; evening foggy, stars visible overhead at 11 P.M.; no aurora seen.

12, 10¾ P.M. Day clear, rather cool; evening rather clear, with some thin clouds and haze; no aurora seen; Zodiacal light suspected about 9½ P.M.

13, 10½ P.M. Day and evening mostly clear and warm; no aurora seen; sky examined for a few minutes about 10 P.M.; bands from Coma as in sketch June 9; some suspicion of "zodiacal band" as June 6, but the appearance may be partly due to a dark bay between the chief line of stars in Serpens on the following side and a line from near Arcturus to β Libræ on the preceding side; the southern end of this bay is bounded by the supposed band.

14, 11 P.M. Day and evening rather clear and warm; many thin clouds early in the evening, also now; no aurora seen.

16, 9¾ A.M. Yesterday warm and rather cloudy; clouds thicker in the evening; lightning without thunder.

16, 11½ P.M. Day rather sultry and cloudy; thunder shower from the west about 7 P.M.; afterwards nearly clear; no aurora seen. Dark bay mentioned June 13 confirmed; its following side lies near δ Serpentis but somewhat precedes δ Serpentis; the preceding branch of the Milky Way runs out to δ Serpentis.

18, 9½ A.M. Yesterday rather clear; evening rather cloudy, especially in the north and west; no aurora seen.

19, 9½ A.M. Yesterday cloudy and sultry, with some rain and a little thunder and lightning; evening cloudy.

20, 9½ A.M. Yesterday clouds at first [illegible]

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cloudy with slight thundershower about 5 P.M.; evening cloudy. Remarkable ranges of very beautiful cumuli in the west early in the afternoon.

20, 11½ P.M. Day clear, cool, rather windy; evening clear with a few clouds near the horizon and a little haze; no aurora seen. Observation of June 16 confirmed; the extension of the Milky Way reaches the head of Serpens; ζ and η Ophiuchi just through the middle of the light span between the branches of the Milky Way; so do τ and σ Sagittarii, pretty nearly.

22, 12¼ A.M. Yesterday mostly clear and warm; evening clear; auroral streamers seen at 10¼ P.M., faint low arch later, still continuing.

22, 11 P.M. Day clear and warm; evening clear, with some haze; no aurora seen.

24, 10 A.M. Yesterday rather hot and cloudy; evening mostly cloudy.

25, 9¾ A.M. Yesterday hot and rather clear; evening mostly cloudy.

25, 9¾ P.M. Day hot and rather clear; evening mostly clear, with thin clouds; no aurora seen.

26, 11¼ P.M. Day mostly clear and rather hot; evening mostly clear; clouds came on about 9 P.M.; no aurora seen.

27, 11¼ P.M. Day mostly clear and warm; clouds at times; evening rather clear, with some thin clouds; no aurora seen; lightning without thunder in the north.

28, 11 P.M. Day variable, sometimes cloudy, rather hot; evening rather cloudy, occasionally clear; no aurora seen; lightning without thunder in the north.

29, 11 P.M. Day cool, sometimes cloudy, mostly clear; evening nearly clear; no aurora seen.

July 1, 9¾ P.M. Yesterday clear and rather cool at first; becoming cloudy; evening cloudy with a little rain; more rain during the night.

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Report to Signal Service sent July 1, 1882.

Aurora regularly looked for on clear evenings. June 21, auroral streamers seen at 10h 15m P.M.; faint, low arch later, continuing at 12h 15m A.M. June 22.

Zodiacal light suspected, June 5, 9, 12. Observations on other evenings hindered by moonlight, twilight, or clouds.

Thunder shower June 4 about 8h A.M. June 16, thunder shower from the west about 7h P.M. June 18, some rain and a little thunder and lightning. June 19, slight thunder shower about 5h P.M.

Lightning on June 8, in the evening, in the west: no thunder. June 15, lightning without thunder in the evening. ~~June 16, thunder shower from the west about 7 P.M.~~ June 28, lightning without thunder in the north, in the evening. ~~June 29, slight thunder shower about 5 P.M.~~

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July 1882.

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 3/4	29.792	65.0	56.5	53.3	55.9	73.3	57.0	3 3/4	0.331	0 calm	10 Pm; raining	1
2	9 3/4	29.674	63.0	65.4	52.8	64.5	64.4	64.4	3 1/2	0.309	2 W	10 Pm Fm →	2
3	9 3/4	29.950	63.0	64.9	51.9	64.3	72.3	64.5	0		2 W.	5 M Fm \	3
4	9 1/2	29.962	66.1	68.1	55.5	67.1	74.6	67.2	0		2 E	9 P R Rs Fm →	4
5	9 3/4	29.854	64.5	59.4	56.6	58.8	70.3	59.2	1 3/4	0.154	2 NE	10 Pm Fm ∠ ; fine rain	5
6	9 3/4	29.882	63.0	65.5	54.6	64.8	64.7	64.7	4 1/8	0.364	1 SW	7 Pm M Fm →	6
7	10	30.100	66.0						0		0 calm	5 R R Rs R R	7
8	9 3/4	30.063	68.7	74.8	55.1	73.3	77.3	73.2	0		1 SW	2 R R Rs Rm	8
9	9	30.014	71.6	75.9	64.9	74.9	83.2	74.4	0		1 SW	1 P R Fm	9
10	8 1/2	29.992	73.5	77.3	66.6	76.2	68.1	76.0	0		0 calm	5 P Fm →	10
11	9 3/4	29.800	77.2	86.5	71.8	85.0	88.2	84.3	0		1 SW	7 Pm Rs Fm →	11
12	9 1/4	29.961	76.5	77.0	67.6	76.1	90.9	76.2	0		1 SW	1 Rs Rm	12
13	10	29.714	75.4	75.7	68.3	74.5	86.7	74.8	2 1/8	0.188	3 SW	10 Pm Fm	13
14	9	30.012	73.2	74.1	62.9	73.1	83.4	73.0	0 3/8	0.033	1 NW	1 P R Rs R	14
15	10	30.226	73.3	73.3	64.0	72.2	83.0	72.3	0		2 E	10 P	15
16	9	30.342	71.0	73.1	60.1	72.2	77.2	72.2	0		0 N	0 P M	16
17	9 1/2	30.288	70.0	71.2	54.5	70.2	82.7	70.1	0		2 SW	0	17
18	8 3/4	30.136	71.8	74.5	63.1	73.0	81.6	73.0	0		2 SW	10 Pm Fm	18
19	9 1/2	29.961	73.6	73.9	67.4	72.8	83.0	72.9	0 1/8	0.011	1 S	10 Pm; a little rain	19
20	9 1/2	29.990	74.0	76.5	67.3	75.1	83.2	75.0	5 1/2	0.485	1 S	9 Pm Fm →	20
21	9 1/2	30.140	72.9	71.1	62.1	70.1	85.1	70.2	0		0 N	5 P Rs M Fm	21
22													22
23	9 3/4	30.097	70.5	73.7	60.4	72.9	80.2	73.0	0		1 NW	0 Fm	23
24	10	30.032	73.7	79.3	64.2	78.2	83.7	78.2	0		1 W	1 R Rs	24
25	10	30.101	76.3	82.4	65.8	81.5	89.2	81.3	0		1 W	0 haze	25
26	9 3/4	30.087	78.1	85.2	68.1	84.3	90.0	84.0	0		2 W	1 Rs	26
27	10	29.999	78.8	85.1	68.8	84.2	90.5	84.0	0		1 NW	0 Rs haze	27
28	9 3/4	29.976	76.1	80.3	66.3	69.1	92.6	69.9	1 1/2	0.132	0 calm	9 Pm M Fm; raining	28
29	10	29.445	77.3	82.0	68.0	80.5	84.1	80.6	3 7/8	0.348	1 SW	9 Pm Fm →	29
30	9 1/2	30.107	74.4	70.6	62.8	70.0	86.0	70.2	0		2 N	1 M Fm	30
31	9 3/4	30.318	73.0	73.1	63.1	72.2	75.6	72.4	0		1 S	1 M Fm haze	31
	9.690	0.015	2185.15	2313.64	1980.49	2210.70	2534.51	2210.82	26 5/8	2.355	95.	149	
	30.000	.116	71.7	73.7	62.2	72.6	80.9	72.7	Rainfall for month		1.2	5.1	
	29.884							Mean					

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July 1882.

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											Obs.
2	9½	29.766	67.9	59.3	3 W	0 Pm 7m	9¼	Moon and twilight	9¼	Moon and twilight	None
3											Obsc.
4											Obsc
5											Obsc.
6	10	30.014	69.6	63.7	0 calm	1 PRs	9¾	Suspected	9¾	None	None
7	9¼	30.052	72.6	68.5	1 S	8 PRs	9¼	Twilight and clouds	9¼	Twilight and clouds	Obsc.
8											None
9	10	30.013	77.7	74.4	0 SW	5 P 7m haze	10	Hazy	10	Haze and clouds	None
10	9	29.896	80.9	77.2	0 SW	1 PRs 7m	9	Twilight	9	None; some clouds.	None
11											Obsc.
12	11	29.927	78.3	69.1	1 S	2 P haze	11	Cloudy	11	Cloudy	None
13	9	29.938	79.7	72.1	0 calm	3 Rs 7m	9	Twilight and clouds	9	Twilight and clouds	None
14											Obsc.
15	11	30.284	75.0	64.9	0 calm	0	8¾	Twilight	11	None	None
16	9½	30.332	77.1	68.4	1 S	3 P 7m	9½	Twilight and clouds	9½	Diffused light	Aurora
17	9½	30.197	75.9	66.2	2 NW	3 P haze	9½	Cloudy	9½	Cloudy	None
18	9½	30.002	76.7	71.9	1 SW	5 P haze	9½	Cloudy	9½	Cloudy	None
19	10¼	29.946	76.8	72.5	1 S	3 PRs haze	10¼	Hazy	10¼	Hazy	None
20	10	30.028	79.0	72.2	0 S	1 PRs haze	10	Clouds and haze	10	None; some haze	None
21	10	30.144	76.9	69.6	0 calm	7 Pm 7m	10	Cloudy	10	None	None
22	9½	30.136	73.0	67.7	1 S	3 PRs	9½	Moonlight and clouds	9½	Moonlight	None
23	9½	30.056	78.0	73.3	0 calm	0 Rs	9½	Moonlight	9½	Moonlight	None
24	9½	30.022	82.2	77.1	1 SW	0	9½	Moonlight	9½	Moonlight	None
25	9½	30.092	83.6	78.8	0 SW	2 7m —	9½	Moonlight	9½	Moonlight	None
26	10¾	30.016	82.8	75.7	0 calm	0 Rs	10¾	Moonlight	10¾	Moonlight	None
27	9	29.992	81.4	72.9	1 N	1 haze 7m	9	Moonlight	9	Moonlight	None
28	10¾	29.900	79.2	72.5	1 SW	10 Pm	10¾	Cloudy	10¾	Cloudy	Obsc.
29	8¾	29.990	82.0	75.3	1 N	5 Pm Rm	8¾	Moonlight	8¾	Moonlight	None
30	9¾	30.220	76.3	64.8	0 calm	9 Pm M 7m	9¾	Cloudy	9¾	Cloudy	None
31	9	30.380	77.0	68.1	2 SE	9 Pm 7m	9	Cloudy	9	Cloudy	Obsc.

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July 1882.

1, 9¾ A.M. Yesterday cloudy with rain, and some thunder and lightning towards night.

2, 9¼ P.M. Day cloudy, rather cool; slight shower about 7½ P.M.; afterwards nearly clear; no aurora seen.

4, 9½ A.M. Yesterday somewhat cloudy, warm; evening cloudy.

5, 9¾ A.M. Yesterday rather cloudy and cool; evening cloudy, with rain.

6, 9¾ A.M. Yesterday cloudy and chilly, with frequent rain.

6, 10 P.M. Day at first cloudy, soon clear and warm; evening clear; no aurora seen; dark bay visible as last month from near α Bootis to β Librae; branch of Milky Way to head of Serpens also seen as before.

7, 9¼ P.M. Day warm, mostly clear; thin broken clouds coming on from the east in the evening.

9, 9 A.M. Yesterday rather hot and somewhat cloudy; evening somewhat cloudy; no aurora seen.

9, 10 P.M. Day rather cloudy and sultry; evening rather cloudy; no aurora seen.

10, 9¾ P.M. Day partly cloudy and very warm at Cambridge by upper C.C.W.; evening rather clear at first, becoming cloudy after 9 P.M. with a little faint lightning; no aurora seen.

12, 9¼ A.M. Yesterday hot and rather cloudy; evening mostly cloudy, with brilliant lightning in the northwest; some thunder.

12, 11 P.M. Day mostly clear and rather hot; evening rather clear, clouds in the north and west; no aurora seen.

13, 10¾ P.M. Day mostly cloudy and rather hot with some showers; evening rather clear with some clouds and haze; no aurora seen.

15, 10 A.M. Yesterday warm and somewhat cloudy; evening mostly cloudy.

15, 11 P.M. Day cloudy at first, mostly clear and warm; evening clear; no aurora seen.

16, 9¾ P.M. Day mostly clear and warm; evening partly clear; diffused auroral light among and above clouds in the north; streamers suspected at times.

17, 10½ P.M. Day clear and warm; evening rather cloudy and hazy; no aurora seen.

18, 9½ P.M. Day cloudy and sultry with a little rain; evening mostly cloudy; no aurora seen.

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19, 10¼ P.M. Day very sultry and cloudy with thundershower 1 to 2 P.M.; one clap very sharp and close; evening hazy, partly clear; no aurora seen.

20, 11½ P.M. Day hot and rather cloudy; evening rather clear; no aurora seen.

21, 10 P.M. Day rather clear and hot; evening rather clear at first; now cloudy; no aurora seen.

22, 10¾ A.M. Barom. 30.172; attached therm. 72.6; external therm. No. 4, 75.2, wind 0 calm; clouds 10 P.M. Cloudy this morning at 5 A.M.

22, 10 P.M. Day warm, somewhat cloudy; evening rather cloudy; no aurora seen.

23, 10½ P.M. Day and evening mostly clear, rather hot; no aurora seen.

24, 10 P.M. Day & and evening clear and hot; no aurora seen.

25, 10½ P.M. Day hot and clear; evening clear with passing clouds; no aurora seen.

26, 10¾ P.M. Day and evening mostly clear and hot; no aurora seen.

27, 10½ P.M. Day clear and hot; evening clear at first, with clouds and fog from the northwest, becoming thick after 10 P.M.; no aurora seen.

28, 10¾ P.M. Day cloudy with moderate thundershowers; evening cloudy and sultry.

29, 10¾ P.M. Day rather cloudy and hot; evening rather clear; no aurora seen.

30, 9¾ P.M. Day rather clear, warm; evening rather cloudy; no aurora seen.

31, 9 P.M. Day rather clear, warm (cloudy about 2 A.M.); evening mostly cloudy.

Report to Signal Service sent Aug. 1, 1882.

Aurora regularly looked for on clear evenings. July 16, at 9h 45m P.M., diffused auroral light among and above clouds in the north; streamers suspected at times.

Zodiacal light suspected at 9h 45m P.M., July 6. Observations on other evenings hindered by moonlight or clouds.

Thunder and lightning. July 1, some thunder and lightning towards night; July 10, a little faint lightning after 9h P.M.; July 11, in the evening brilliant lightning in the northwest, some thunder. July 19, from 1h to 2h P.M., thunder shower; one clap very sharp and close. July 28, moderate thundershowers during the day.

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August 1882

Date	Time A.M.	Barometer	Attached Thermometer No. 4		Minimum before and after setting		Maximum before and after setg.		Gauge	Rainfall in inches	Wind	Clouds	Date
1	10	30.336	72.3	73.9	60.7	72.8	75.2	73.0	0		1 SW	4 R Rs	1
2	10½	30.162	72.5	76.8	60.1	75.7	82.0	75.4	0		1 W	5 R Rs	2
3	8¾	30.026	72.0	72.5	60.7	71.9	84.9	71.6	0		0 N	1 Rs	3
4	9½	30.104	73.7	77.1	63.0	76.0	83.9	77.0	0		1 N.E.	5 Rs.	4
5	9½	30.156	74.3	78.4	62.0	77.1	87.4	78.8	0		1 S.S.W.	9 P.	5
6													6
7	9½	29.934	76.8	80.1	66.5	78.8	90.4	80.3	0		3 S.W.	6 Pm Fm.	7
8	9½	29.758	78.1	80.2	71.3	78.9	89.0	79.9	0		2 S.S.W.	4 Rs. Fm.	8
9	9	29.699	78.1	77.9	69.5	77.0	91.2	77.2	3½	0.309	1 S	9 Pm M Fm	9
10	10½	29.976	76.8	78.6	65.1	77.3	86.5	77.4	0		2 SE	1 M Fm haze	10
11	8¾	30.050	73.2	68.8	62.7	68.2	80.1	68.5	0½	0.044	2 W	0	11
12	8	30.090	72.0	68.7	60.3	67.4	78.5	68.0	0		1 SW	10 P	12
13	9¾	29.922	73.4	75.3	64.8	74.5	81.0	74.6	0		3 W	2 M Fm → Rs	13
14	9	30.100	68.0	67.6	51.3	66.7	82.4	67.1	0		2 E	1 R Rs haze	14
15	9¼	30.026	73.9	78.0	66.6	76.9	81.2	77.0	0		2 SW	1 haze	15
16	9¼	30.048	75.9	78.3	67.3	76.9	89.8	77.2	0		1 S	10 Pm; a little rain	16
17	9½	29.784	75.2	77.2	67.6	76.1	78.6	76.2	6⅜	0.563	1 SW	7 Pm Fm	17
18													18
19	11½	30.099	66.0	64.2	50.2	63.4	85.9	64.9	0		3 N.W.	0	19
20													20
21	10	30.316	64.7	64.7	49.8	64.9	73.2	66.5	0		1 N.W.	2 M.	21
22	10½	30.182	66.1	71.7	52.8	70.3	71.8	71.8	0		1 S.W.	3 M.	22
23	10¼	30.122	68.3	73.1	58.5	71.9	77.3	72.8	0		3 S.W.	7 Fm Rs. →	23
24	9¾	29.884	70.2	71.8	64.0	70.3	79.8	72.8	See p. 186	0.673	0.S.W.	10 Pm.	24
25	9¾	29.864	69.6	68.9	61.1	68.0	78.9	69.7	0⅞	0.022	4 N.N.W.	2 Rm.	25
26	10¼	30.187	68.2	66.0	56.0	65.0	76.9	66.7	0		2 E.	8 Rm ← Fm	26
27													27
28	9½	30.100	65.8	64.4	52.8	68.7	71.2	66.0	0		0 SE.	4 Rs. + Fog.	28
29	9½	30.198	65.5	67.2	51.8	66.7	71.5	68.2	0		2 N E.	0.	29
30	9¾	30.228	66.2	70.7	52.0	69.7	72.2	69.9	0		0 W.S.W.	7 Rs. (thin)	30
31	9¾	30.180	69.1	72.6	57.8	71.1	63.4	72.9	0		2 S.W.	7 Rs.	31
	9.6	811.531 30.957 29.942	1925.9 71.3	1965.7 72.18	1625.7 60.2	1942.2 71.9	2162.2 80.1	Change Set yesterday fluctuating	18¼	1.611	42.6	125 4.6	

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August 1882

Date	Time P.M.	Barometer	Attached Thermometer	No. 4	Wind	Clouds	Time P.M.	Zodiacal Light	Time P.M.	Aurora	Report of Signal Service
1	10	30.351	76.0	66.5	2 SW	9 P	10	Cloudy	10	Cloudy	Obsc.
2	9	30.090	78.3	69.9	0 calm	4 P Rs	9	Twilight and clouds	9	Twilight and clouds	None
3	10½	30.063	77.9	67.6	0	4 Ro.	10½	None.	10½	None.	None
4	11½	30.138	78.3	68.7	0	5 Rs.	11½	None.	11½	See next page.	Aurora
5	11½	30.124	78.1	71.4	2 S.W.	3 Ro.	11½	None.	11½	None.	None
6	11½	30.008	81.0	74.2	1 S.E.	0	11½	None.	11½	See next page.	Aurora (3)
7											None
8											Obsc
9											None
10											Obsc
11											None
12											Obsc
13											None
14											~~Aurora None~~
15											None
16											Obsc
17											Aurora
18											None
19	11¾	30.198	67.9	55.9	0. N.N.W.	0	11¾	None.	11¾	None.	None
20	9¾	30.288	68.4	57.2	1. N.W.	0	9¾	None.	9¾	None.	None
21	12	30.244	68.1	56.9	0. S.	1 Ro.	12	None.	12	See p. 186.	Aurora
22	11¾	30.184	70.6	62.7	4 S.W.	1 P.	11¾	None.	11¾	None.	None
23											Obsc.
24	10½	29.824	74.9	69.2	1 S.E.	2 Pu Fm.	10½	Moonlight.	10½	Moonlight.	None
25	10¼	30.005	72.2	61.5	1 N E.	3 Ro.	10¼	Moonlight.	10¼	Moonlight.	None
26	8½	30.239	68.8	59.0	0 E.	2 P	8½	Moonlight.	8½	Moonlight.	None
27	9¾	30.174	70.2	60.3	0 S.W.	10 Ro. (thin)	9¾	Moonlight.	9¾	Moonlight.	None
28	9¾	30.122	70.2	60.7	0 S. E.	10 P.	9¾	Moonlight.	9¾	Moonlight.	None
29	11¼	30.250	68.9	56.4	0 S.W.	0	11¼	Moonlight.	11¼	Moonlight.	None
30	11¼	30.202	73.2	65.0	0. S.W.	0	11¼	Moonlight.	11¼	Moonlight.	None
31											None

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August, 1882.

1, 10 P.M. Day rather clear and warm; evening cloudy, clouds rather thin.

2, 10¼ P.M. Day mostly rather cloudy; evening rather clear; no aurora seen.

3, 10½ P.M. Day quite warm, and generally clear, as respects clouds. & much smoke and haze. — more in evening, with some light clouds. No aurora seen. W. obs.

4. 11½ P.M. Day rather warm. Some clouds and fog in early part of day. — clearer towards noon — light clouds increasing in latter part of day, gradually growing thinner in evening.

Brilliant aurora began about 9 o'clock P.M, and traces of it still visible. Four streamers reaching to zenith. A portion of the time the auroral light covered the whole northern heavens and extended into the southern portion as well. W. obs.

5. 11½ P.M. Day rather warm. Began to be cloudy early in forenoon. — became clear about sunset. No aurora seen. W. obs.

6. 11½ P.M. Day very warm and ~~oppr~~ heat oppressive. Somewhat cloudy in afternoon and early part of evening. ~~seen~~. Thought there might be a trace of aurora about horizon a short time since but moon just about rising and it possibly may be due to this. W. obs.

8. 9½ A.M. Yesterday warm and sultry. Quite cloudy in afternoon and evening. No zodiacal light or aurora seen. W. obs.

9, 9 A.M. Yesterday evening mostly cloudy. Rain with thunder and lightning during part of the night.

10, 10½ A.M. Yesterday rather cloudy and latter evening mostly so. No aurora seen.

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11, 8¾ A.M. Yesterday hot and variable; evening cloudy.

11, 1 P.M. The aurora of August 4 was observed by A. Searle at Noyes' Beach, about six miles southeast of Westerly, R.I., between about 8½ and 10 P.M. No corona was formed, but about 9 P.M. there were short bright streamers south of the magnetic zenith. The aurora was extensive and sometimes brilliant. No regular arch, but clouds in the north hindered observations near the horizon there. At 9¼ P.M. a narrow bright arch had been formed east and west, but not reaching the horizon either way. It was nearly stationary for a few minutes, ε Bootis being near the northern, α Coronæ near the southern edge, δ Sagittæ near the central line, β Delphini near its eastern end. At 9⅓ P.M. it was fainter and farther south, α Coronæ near the central line, and soon after near the northern edge.

12, 8 A.M. Yesterday clear and warm day and evening; no aurora seen.

13, 9¾ A.M. Yesterday warm and rather cloudy day and evening.

14, 9 A.M. Yesterday mostly clear and warm day and evening; no aurora seen.

15, 9¼ A.M. Yesterday warm and rather clear; evening mostly clear; no aurora seen.

16, 9½ A.M. Yesterday hot and mostly clear day and evening; no aurora seen.

16, 4½ P.M. Aurora reported by C.C.W. Aug. 14, 10 P.M.: broken arch through Polaris, another (the principal) below. Lasted about half an hour.

17, 9½ A.M. Yesterday rather sultry; day and evening cloudy with rain, rather heavy about noon.

19. 11½ A.M. Thursday (the 17th) somewhat cloudy but in general, rather mild and pleasant. An aurora of limited extent, rather close to horizon, but quite bright, seen about midnight. No zodiacal light seen. Evening clear.

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19. 11¼ A.M. Yesterday rather cool and pleasant. Generally clear throughout day and evening. No aurora or zodiacal light seen. W. obs.

19. 11¾ P.M. Day generally clear and cool. Some clouds in afternoon but clear again in evening. No aurora seen. W. obs.

20. 9¾ P.M. Day generally clear and cool. No aurora seen. W. obs.

21. 12 M. This M. is understood to denote midnight, not noon

Day mainly clear and rather cool. A slight trace of aurora seen between 8 and 9 P.M. This has lasted throughout the evening, becoming brighter in appearance as moon went down, as well as brighter intrinsically. At present time it forms a long bright band of light ~~in north~~ along northern horizon ~~and~~ with its upper limit at an altitude of about 15°. W. obs.

22. 11¾ P.M. Day mild, ~~and pleasant~~ rather. Cloudy in forenoon, gradually clearing towards night. No aurora seen. W. obs.

24. 10. A.M. Yesterday mild and pleasant. Somewhat cloudy in forenoon but clouds broken. Clearer in afternoon. In evening, cloudy, and quite heavy showers during the night. Rain apparently not over, as gauge as yet undisturbed. W. obs.

24. 3¾ P.M. Weight of water in gauge 7 5/8 oz = 0.673 in. W.

24. 10½ P.M. Day rather warm and sultry. Air heavily charged with moisture. Rather cloudy throughout day. — clearing during the evening, but many broken clouds passing. — some lightning in N.E. Quite a shower but of short duration at about 7 P.M. No aurora seen. W. obs.

25. 9¾ A.M. As a result of the shower mentioned above as occurring last evening, the gauge shows 2/8 oz = 0.022 inch. W.

25. 10¼ P.M. Day rather cool and pleasant. Many broken clouds passing. No aurora seen. W. obs.

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26. 8½ P.M. Day rather cool – east wind. – Considerably cloudy during day. Cleared towards night, but coming up cloudy again. No aurora seen. W. obs.

27. 9¾ P.M. Day cool and pleasant. No aurora seen. W. obs.

28. 9¾ P.M. Day cool and generally clear. Became cloudy suddenly a little after 9 P.M. No aurora seen. W.

29. 11½ P.M. Day cool, clear and pleasant. No aurora seen. W. obs.

30. 4½ P.M. Day somewhat warm – generally clear except a few thin clouds and scattered cumuli. Clear in evening. No aurora seen. W.

Report to Signal Service sent Sept. 1, 1882.

Aurora regularly looked for on clear evenings. Aug 4, brilliant aurora began about 9h P.M. and traces of it still visible (at 11h 30m P.M.): fine streamers reaching to zenith. A portion of the time the auroral light covered the whole northern heavens and extended into the southern portion as well. Aug. 6, ~~thought there might be~~ suspected a trace of aurora about horizon a short time before 11h 30 P.M.; but moon just above, rising and it may possibly be due to this. Aug 14, ~~aurora reported by A.C. Mendall~~, at 10h P.M. broken arch through Polaris; another, (the principal) below. Lasted about half an hour. Aug. 17, an aurora of limited extent, rather close to horizon, but quite bright, seen about midnight. Aug. 21, a slight trace of aurora seen between 8h and 9h P.M.; this has lasted through the evening, becoming brighter in appearance as moon went down, as well as brighter intrinsically. at present time (12h P.M.) it forms a large bright band of light along northern horizon with its upper limit at an altitude of about 15°. All the preceding observations are by C.A. Mendall. The aurora of Aug. 4 was also observed by A. Searle, (of the Observatory), at Noyes' Beach, about six miles southeast of Westerly, R.I., between about 8h 30m and 10h P.M. Dose No corona was formed, but about 10h P.M., there were short bright streamers south of the magnetic zenith. The aurora was extensive and sometimes brilliant. No regular arch, but clouds in the north hindered observations near the horizon there. At 9h 15 P.M., a narrow bright arch had been formed east and west but not reaching the horizon either way. It was nearly stationary for a few minutes, ε (Epsilon) Bootis being near the northern, α (Alpha) Coronae near the southern edge, δ (Delta) Sagittae near the central line, β (Beta) Delphini near its eastern end. At 9h 20m P.M. it was fainter and farther south; α (Alpha) Coronae near the central line, and soon after near the northern edge.

Zodiacal light not seen during the month.

Thunder and lightning with rain, Aug. 8, during part of the night.

Lightning during the evening of Aug. 24, in Northeast. (Like a shower of short duration about 7h P.M.)

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September, 1882.

Date	Time A.M.	Barometer	Detached Thermometer No.4	Minimum before & after setting	Maximum before & after setting	Gauge	Rainfall in inches	Wind	Clouds	Date
1	10½	30.093	71.8	74.8	63.8 73.1	81.5	74.5	See p. 190.	1 W.S.W.	10 Pm. P.	1
2	9¼	30.129	72.0	73.2	65.4 72.1	79.3	72.3	0¼	0.022	2 NE	3 P Fm	2
3	9	30.176	70.0	69.6	61.0 68.4	74.0	69.0	0		1 S	2 P Fm haze	3
4	9¼	30.100	73.0	74.4	67.0 73.0	82.5	73.2	0		1 SW	10 P; a little rain	4
5	9½	30.097	72.0	73.2	65.8 72.1	77.9	72.3	0¼	0.022	2 N	0 M Fm	5
6	9	30.272	69.4	68.5	60.6 67.3	78.3	68.0	0		2 NE	4 Pm Fm ←	6
7	9½	30.094	66.5	64.4	58.4 63.4	72.3	64.0	0		1 S	0 haze	7
8	10	29.948	70.8	73.1	62.1 71.9	74.5	72.2	0		1 S	2 Rs haze	8
9	9½	30.046	68.7	61.1	60.2 60.2	78.6	61.0	1¾	0.154	2 NE	10 P mist	9
10	9½	30.111	64.6	59.8	51.9 59.1	65.0	59.7	0¼	0.022	1 NW	1 Pm Rs haze	10
11	9¼	29.982	67.6	66.1	59.0 65.0	69.0	65.8	0		2 E	10 Pm	11
12	9½	29.775	61.8	55.6	52.9 54.2	66.3	65.4	32¾	2.890	2 N	10 Pm Fm; raining	12
13	10	30.204	59.0	57.2	45.4 56.7	65.0	57.2	0⅛	0.011	2 N	1 haze Rs	13
14	9½	30.070	61.0	59.1	51.2 58.1	62.2	58.8	0¼	0.022	1 SE	10 Pm Fm 1; raining	14
15	10¼	29.619	65.5	67.3	58.1 66.3	67.3	66.9	8⅛	0.717	3 NW	9 Pm M Fm ↘	15
16	9½	29.836	61.8	63.1	51.2 62.2	68.1	62.6	0		2 W	0 Fm	16
17	—	—	—	—	—	—	—	—	—	—	—	17
18	11	29.860	64.2	73.7	47.4 71.6	72.7	72.1	0		S.W. 5	7 Fm P.	18
19	9¾	29.920	69.7	77.5	64.0 75.4	79.1	76.1	0		S. 3	9 Pr.	19
20	1 P.M.	30.030	76.8	80.2	67.5 77.9	84.0	78.9	See p. 192.		1 N.	10 Pm.	20
21	10½	30.328	66.0	57.8	54.9 54.9	79.6	58.9	See p. 192.		5 N.E.	10 Pm.	21
22	9¼	30.264	61.8	57.1	52.4 56.0	59.2	57.9	See p. 192.	2.150	2 N.E.	10 Pm.	22
23	9½	30.124	67.0	71.2	56.0 69.9	70.0	69.5	13⅝	1.201	1 S.E.	8 Pm.	23
24	9½	30.092	69.0	65.4	64.1 64.6	75.8	65.0	6¼	0.552	1 NW	10 Pm Fm	24
25	9¼	30.305	64.4	58.2	56.3 57.3	66.3	58.0	0⅛	0.011	2 NE	10 Pm; a little rain	25
26	9½	30.227	62.6	59.3	54.9 58.4	61.1	59.2	1	0.088	3 NE	10 Pm M Fm	26
27	9¼	30.226	59.0	54.7	48.0 53.9	61.0	54.7	0		2 NE	9 P 2 Rs	27
28	9¾	30.249	55.8	53.1	42.4 52.2	56.5	53.0	0		3 NE	10 Pm Fm 6	28
29	9½	30.148	57.7	52.9	48.2 52.0	53.9	52.7	3½	0.309	3 NE	1 a Pm Fm 6; a little rain	29
30	9½	30.200	59.0	60.2	51.1 59.3	59.5	59.4	1¼	0.110	2 N	10 P Fm	30
	9.6	842.695 30.996 29.996	1833.7 65.5	1799.6 64.3	1573.7 56.2	1768.6 63.2	1956.5 69.9	Max set inside building	see p. 192	8.281 Rainfall for month 8.28 in.	58 2.1	195 7.0	

* Abbr. [illegible]

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September, 1882.

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 1/2	30.012	75.0	69.1	0 S	0 Rs	9 1/2	Moonlight	9 1/2	Moonlight	None
2	9 3/4	30.164	73.4	63.0	0 calm	6 P Rs 7m	9 3/4	Moonlight and clouds	9 3/4	Moonlight and clouds	None
3	9	30.130	75.5	68.8	1 S	9 P	9	Cloudy	9	Cloudy	None
4	9 1/2	30.050	75.1	69.2	0 calm	6 P haze	9 1/2	Hazy	9 1/2	Cloudy	Aurora
5	9 1/2	30.188	73.8	64.9	1 NW	6 P 7m	9 1/2	Cloudy	9 1/2	Cloudy	None
6											Obsc.
7	8 1/2	30.000	74.2	66.0	1 SE	1 haze	8 1/2	Hazy	8 1/2	Hazy	None
8											Obsc.
9											Obsc.
10											Obsc.
11											Obsc.
12	10 1/4	30.050	63.5	54.1	2 N	0	10 1/4	None	10 1/4	None	Aurora
13	9 1/4	30.198	64.1	52.9	1 E	9 P haze	9 1/4	Cloudy	9 1/4	Cloudy	None
14											Obsc.
15	8 3/4	29.822	66.2	60.6	2 NW	10 P	8 3/4	Cloudy	8 3/4	Cloudy	None
16	9 3/4	29.850	66.1	58.4	2 NW	0	9 3/4	None	9 3/4	None	None
17											Supp. Aurora
18	11	29.926	71.1	69.2	0 S. W.	0	11	None	11	None	None
19											None
20	10	30.170	75.1	68.5	2 N. N. E.	10 Pm.	10	Cloudy	10	Cloudy	None
21											Obsc.
22	10 1/4	30.120	65.9	64.5	0 E.	10 Pm	10 1/4	Rainy	10 1/4	Rainy	None
23											Obsc.
24											Obsc.
25											Obsc.
26											None
27	8 3/4	30.268	60.1	51.9	1 N	1 P Rs 7m	8 3/4	Moonlight	8 3/4	Moonlight	None
28											Obsc.
29											Obsc.
30											Obsc.

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1880phae.proj.1718w

September 1882.

1. 10½ A.M. Yesterday somewhat warm. Increasing cloudiness during afternoon and evening. No aurora seen. H. A very small quantity of water in gauge but left undisturbed, as it is too small to measure and more rain is probable. W.

1, 9¾ P.M. Day cloudy and warm; a few drops of rain in Boston 1 to 2 P.M.; clear at Cambridge after 7 P.M.; no aurora seen before or after moonrise.

2, 10 P.M. Day rather clear; evening partly clear; no aurora seen.

3, 9 P.M. Day cloudy at times, sometimes clear; evening rather cloudy; no aurora seen.

4, 5 P.M. Solar halo Sept. 3, 1 P.M., reported by W. V. Brown.

4, 10¾ P.M. Day rather cloudy, with a few drops of rain. Evening rather clear at first, afterwards more cloudy; pretty distinct appearance of aurora among clouds about 10½ P.M. for a few minutes.

5, 9½ P.M. Yesterday evening lightning without thunder in the north and northwest. Today mostly rather clear, with passing clouds; evening partly clear; no aurora seen.

7, 9½ A.M. Yesterday rather clear and warm; evening cloudy.

8, 10 A.M. This morning cloudy about 1 A.M.; yesterday rather clear and warm, evening rather clear, with haze; no aurora seen.

9, 9½ P.M. Yesterday mostly cloudy with a little rain and much thunder and lightning; evening cloudy.

10, 9½ A.M. Yesterday cloudy day and evening; a little rain early in the day.

11, 9½ A.M. Yesterday clear, becoming cloudy towards night; evening cloudy.

12, 9½ A.M. Yesterday cloudy with much wind and rain especially in the afternoon and evening.

12, 11¼ P.M. Day cloudy with rain, becoming clear towards noon; evening clear; auroral streamers suspected at 8h 20m P.M., not seen later till 10h 20m P.M.; then distinct form afterwards distinct; at 10½ P.M. distinct but not numerous streamers and some appearance

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of bow arch, sky dark below; at 11 P.M. aurora somewhat perceptible but very faint. Band from Aquila to the Pleiades as usual, but with a somewhat abrupt increase of light about ϕ Aquarii; noticed about 10 P.M., and more particularly at 11 P.M.; centre of supposed Gegenschein half way from ϕ Aquarii to 27 Piscium, Day. $23^h 32^m$, $-5°$. { ϕ Aquar. 23 8.1 −6 41 / 27 Psc. 23 52.5 −4 13 / Gegenschein 23 30.3 −5 27 }

13, 10 P.M. About 11¾ P.M. last night Mr. Kendall looked for Gegenschein and selected independently the same region as that above described. He described the centre as above the middle of the line from ϕ Aquarii to 27 Piscium, and concurred in the description above (half way from ϕ Aquarii to 27 Piscium) on being informed of it. He thought the light different in character from that of the band from Aquila; more uniformly diffused or nebulous, like dried milk.

13, 9¼ P.M. Day clear, cool, with east wind; evening at first rather clear, soon cloudy; no aurora seen.

15, 3¾ A.M. Barom. 29.548; attached therm: 65.1; No. 4, 62.1. Yesterday cloudy; rain in the evening, preceded and accompanied by very frequent lightning above the lowest layer of clouds, and some thunder. Afterwards clearer; now rather cloudy, especially in the north and west.

16, 9½ A.M. Yesterday somewhat cloudy; evening cloudy at times; clear about 10 P.M.; no aurora seen; Gegenschein slightly suspected with centre at 20 Piscium $\left(\begin{matrix} 23^h 42^m & -3°.5 \\ 23\ 41.7 & -3.4 \end{matrix}\right)$

16, 8½ P.M. Looked carefully about 20 minutes ago for any zodiacal band which might be present in Capricornus. Saw no trace of any such light: Capricornus decidedly dark throughout as compared with band from Aquila to 27 Piscium which was evident.

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September, 1882

16, 11 P.M. Gegenschein pretty decidedly suspected, and thought not to extend as far towards φ Aquarii as on Sept. 12; centre now estimated half way from 21 to 27 Piscium; $23^h 48^m$, $-1°.9$. 23 43.3 +10.25 / 23 52.5 −4.13 / 23 47.9 −1.54

17, 2 A.M. Yesterday clear and cool day and evening; perhaps a little aurora low in the north 1 to 2 A.M. today.

17, 11 A.M. Barom. 29.982; attached therm. 59.7; No. 4, 60.2. Minimum 48.0 (left without setting). Wind 3 NW; clouds 8 P Rs.

18. 11 P.M. Day warm and sultry with clouds and haze. S.W. wind. No aurora seen. W. obs.

19. 10½ A.M. At about 4 o'clock this morning zodiacal light very plainly seen in east. W. obs.

20. 1 P.M. A few drops of rain fell this forenoon – a very little water in gauge which is left undisturbed. W.

20. 10 P.M. Day warm and sultry with some showers. Considerable thunder to the south about noon. Cloudy all the latter part of day and during evening. No aurora seen. W. obs.

21. 10½ A.M. Rainy. Some water in gauge but left undisturbed. W. obs.

22. 9½ A.M. Rainy all day yesterday and still cloudy this morning. Water in gauge as yet undisturbed. W. obs.

22. 10½ P.M. Day cloudy with heavy rains in evening. Bottle in gauge nearly full of water. Water in gauge = $2\,\frac{3}{8}$ oz = 2.150 inches. Bottle emptied. No aurora seen. W. obs.

23. 9½ A.M. Heavy rain during night. Water in gauge weighs $1\,\frac{5}{8}$ oz. = 1.201 inches. W.

24, 9½ A.M. Yesterday cloudy and rather sultry, with rain in the following night.

25, 9½ A.M. Yesterday cloudy day and evening; a little rain early today.

27, 9½ A.M. Yesterday and previous day mostly cloudy; yesterday somewhat

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clear at times; evening partly clear; no aurora seen.

28, 9¾ A.M. Yesterday mostly cloudy, rather clear towards night; evening partly clear; no aurora seen.

29, 9½ A.M. Yesterday cloudy and cool, with rain in the evening and following night.

30, 9½ A.M. Yesterday cloudy and cool day and evening, with some rain.

Oct. 1, 9¾ A.M. Yesterday cloudy day and evening; rather cool.

Report to Signal Service sent Oct. 2nd 1882.

Aurora regularly looked for on clear evenings. Sept. 4, about 10h 15m P.M, pretty distinct appearance of aurora among clouds for a few minutes. Sept. 12, at 8h 20m P.M, auroral streamers suspected; not seen till later 10h 20m P.M; then suspected, soon afterwards distinct; at 10h 30m P.M, distinct but not numerous streamers and some appearance of low arch, sky dark below; at 11h P.M, aurora somewhat perceptible but very faint. Sept. 17, perhaps a little aurora low in the north 1h to 2h A.M.

Zodiacal light. Sept. 19, about 4h A.M, very plainly seen in east; ~~the time at which the light is hindered by moonlight or clouds~~ more seen on any evening; observation hindered by moonlight or clouds.

Solar Halo, Sept. 3 1h P.M.

Lightning Sept 4, in the evening, without thunder in the north and north-west

Thunder. Sept 20, about noon, considerable thunder to the south.

Thunder and lightning. Sept. 8. Much thunder and lightning, with a little rain.

Sept 14, in the evening, rain preceeded and accompanied by very frequent lightning above the lowest layer of clouds, and some thunder.

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October 1882.

Date	Time A.M.	Barometer	Attached Thermometer	No. 4	Minimum before & after setting		Maximum before & after setting		Gauge	Rainfall in inches	Wind	Clouds
1	9¾	30.132	61.1	62.0	53.2	61.3	61.8	61.4	0		1 NW	5 Pc Rs Pm
2	9½	30.136	62.1	63.3	52.6	62.5	69.6	62.9	0		3 NW	2 Pc Rs
3	9¾	30.296	57.3	50.4	40.1	49.6	66.2	50.3	0		2 NE	4 M Fm →
4	9½	30.232	55.6	49.8	37.7	49.2	58.0	50.0	0		1 N	0
5	9½	30.316	58.5	56.9	49.1	55.9	61.9	56.3	0		1 NW	10 Pm
6	9¼	30.433	57.8	57.5	48.3	56.3	62.7	56.9	0		1 S	10 Pm Fm →
7	9¾	30.204	58.9	61.8	52.1	60.7	62.9	60.8	0		1 SW	10 Pm
8	9½	30.046	61.0	63.8	55.1	62.9	68.0	63.0	0		1 SW	4 Pc Rs
9	9½	30.024	63.2	64.3	56.1	63.4	69.4	63.8	0		1 SW	0 Fm
10	9½	29.890	62.1	60.2	54.0	59.5	72.5	60.0	0		2 W	0
11	9¾	30.134	56.2	49.2	41.6	48.2	66.6	49.2	0		2 E	10 Pm Fm
12	9½	30.330	55.2	52.2	46.1	51.3	56.8	52.0	0		2 NE	10 Pm Fm
13	10¾	30.247	55.3	55.2	46.0	54.3	57.8	54.9	0		2 E	9 Pm M Fm —
14	10	30.018	57.4	52.0	48.3	51.2	55.8	52.0	4⅞	0.430	2 N	10 Pm; raining
15	10¼	30.048	55.1	54.0	45.0	53.4	53.2	53.2	9⅛	0.805	2 NE	5 Pc Rs
16									~~2¼~~	~~0.199~~	~~0 calm~~	~~10 P fog~~
17	10	30.045	58.8	59.3	47.2	58.2	59.5	58.8	2¼	0.199	0 calm	10 P fog
18	9¼	30.018	64.0	67.0	58.2	65.4	66.6	66.2	0		0 calm	10 P fog
19	9¾	29.874	63.3	58.1	57.3	57.3	73.0	57.9	3¼	0.287	2 NE	10 P; raining
20	9¾	30.145	57.6	49.5	44.7	48.9	60.7	49.9	2¾	0.243	2 NW	10 Pm Fm
21									see p. 198	0.011		
22												
23	10¼	30.014	55.9	53.8	35.7	52.9	54.0	53.7	0		1 NE	10 P
24	9½	29.746	57.1	53.0	50.4	52.1	56.2	53.0	0⅛	0.011	2 NE	10 P
25									see p. 199	0.022		
26	10½	29.773	54.8	56.6	37.7	55.7	55.9	55.9	0		1 SW	0 haze
27	9½	30.100	51.9	47.0	36.0	46.3	63.7	47.2	0		2 W	0 Rs
28	10	30.262	53.6	48.1	35.5	47.2	54.4	48.7	0		2 E	0
29	10	30.093	52.4	50.1	33.5	49.2	50.7	50.2	0		2 SE	10 Pm
30	9¾	30.084	58.0	55.9	49.1	55.1	61.1	56.0	0		1 NW	5 Pc Rs Fm
31	9¾	30.142	53.9	50.7	38.3	49.5	61.7	50.0	0		0 W	10 P
	9.8	8.12.832 30.1098	55.83 57.7	50.1.7 55.6	1249.4 46.3	1478.0 54.7	1557.6 61.4	Max. set previous	see p. 198, 199	2.038 Rainfall	39 1.4	174 6.4

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October 1882.

Date.	Time P.M.	Barometer Attached Thermometer No. 4			Wind	Clouds	Time P.M.	Zodiacal light	Time P.M.	Aurora	Remarks
1											None
2											Aurora
3	9 3/4	30.196	60.7	48.0	1 NE	0	8 1/2	Suspected	9 3/4	None	None
4	9	30.204	60.8	52.5	0 calm	9 Pm	9	Cloudy	9	Cloudy	Aurora
5											Aurora
6											Obsc.
7	10 3/4	30.080	62.9	59.2	1 W	1 haze	10 3/4	None	10 3/4	None	None
8	10 1/2	30.025	67.3	61.5	0 S	0 haze	10 1/2	None	10 1/2	Slightly suspected	Susp.
9	10 1/2	29.860	65.8	60.7	2 SW	2 P haze	8	Suspected	10 1/2	None	None
10	10 3/4	29.988	61.9	48.7	2 N	0	8	Visible	10 3/4	Suspected	Aurora
11											Obsc.
12											Obsc.
13											Obsc.
14											Obsc.
15											Aurora
16											Aurora
17											Obsc.
18											Obsc.
19											Obsc.
20											None.
21	8 3/4	30.345	56.9	42.9	1 N	0	8 3/4	Moonlight	8 3/4	Moonlight	None
22											Obsc.
23											Obsc.
24											Obsc.
25	9 3/4	29.856	53.8	43.2	0 calm	5 P 2 7m	9 3/4	Moonlight and clouds	9 3/4	Moonlight and clouds	Aurora
26	8 1/2	29.996	58.9	49.3	1 NW	0 7m	8 1/2	Moonlight	8 1/2	Moonlight	None
27											Obsc
28	8 1/2	30.300	56.4	42.4	1 SE	0	8 1/2	Moonlight	8 1/2	Moonlight	None
29											Obsc.
30	10 3/4	30.116	57.4	47.3	1 N	4 P R haze	10 3/4	Moonlight	10 3/4	Moonlight	None
31											Obsc.

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2, 9½ A.M. Yesterday clear and rather warm; no aurora seen.

3, 9¾ A.M. Yesterday clear and rather warm; extensive auroral light during the evening among clouds in the north; a few faint streamers about 9¾ P.M. Near 10 P.M. the band of light from Aquila was visible as usual, and the maximum near 27 Piscium seen last month had apparently disappeared; but the auroral light and the incipient moonlight hindered observation.

3, 9¾ P.M. Day rather cloudy at first, soon clear and rather cool; evening clear; no aurora seen; zodiacal light suspected as far as ρ Capricorni or somewhat farther; but following part of Capricornus certainly dark; band from Aquila well seen; sky preceding 27 Piscium now shows no maximum; maximum thought to exist about half way between ξ Piscium and δ Piscium: 0h 57m, +4°.9. ο Ceti examined; difficult to estimate, and seems to vary more with respect to η and ι Ceti than they do relatively to each other. On the whole η estimated 0.4 mags. brighter than ι, and θ 0.3 of the interval from η to ι. But it seemed at times no brighter than ι, and at others very nearly equal to η.

4, 9½ A.M. At 4¼ to 4½ A.M. white cloud near θ Leonis on side opposite from that of δ Leonis. It was apparently auroral light, as it rapidly changed form and brightness, occasionally vanishing and reappearing. No other auroral light seen.

4, 10½ A.M. Mr. Wendell says that at 3¾ A.M. there was an auroral arch, which was gradually reduced to the spot of light just mentioned.

5, 9½ A.M. Yesterday clear, rather cool, becoming cloudy about 8½ P.M.; no aurora seen.

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6, 9¼ A.M. Yesterday mostly cloudy; evening rather clear at times; much light among clouds in the north, apparently auroral.

7, 9¾ A.M. Yesterday cloudy day and evening.

7, 10¾ P.M. Day cloudy and warm, clear towards night, with haze; no aurora seen; θ Ceti half way from η to ι; η certainly as much as 0.3 magn. brighter than ι.

8, 11 P.M. Day rather clear and warm; evening very slightly hazy; if Gegenschein is present, its centre may be at ζ Piscium; the suspicion is slight; θ, η, and ι Ceti about as yesterday, but θ seems to vary as on Oct. 3.

Gegenschein $1^h 8^m, +7°.0$
1 7.5

9, 10½ P.M. Day mostly clear and warm; evening mostly clear early; cloudy for a time about 10 P.M., then clearer again; no aurora seen; zodiacal light at 8 P.M. thought to be visible as far as θ Capricorni.

10, 11½ P.M. Day mostly clear, growing cool; aurora suspected at 10¾ P.M., streamers seen later; zodiacal light early in the evening about as yesterday, but more distinct. Gegenschein about as on Oct. 8, if present; but the suspicion is slight although the night seems clear; its centre may be ⅓ of the way from ζ to ο Piscium; $1^h 18^m, +7°.5$
1. 7.5 7.0 1 3.21 +8.5 1 18.0 +7.5
θ Ceti seems pretty steady and no brighter than ι; both θ and ι decidedly fainter than η.

12, 9½ A.M. Yesterday cloudy and cool day and evening.

13, 6 A.M. Barom. 30.250; attached therm. 55.0; No. 4, 46.9. Yesterday mostly cloudy; evening cloudy, clouds rather thin; partly clear at 3 A.M. today and later; frequent clouds from the east; no aurora seen; zodiacal light evident among eastern clouds this morning.

14, 10 A.M. Yesterday mostly cloudy day and evening;

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October, 1882.

15, 6 A.M. Barom. 30.048; attached therm. 55.7; No. 4, 45.8. Yesterday cloudy with much rain; evening cloudy; partly clear for a time after sunset; clear early today except in the northeast. aurora 3 A.M. and later faint, low, irregular. Zodiacal light conspicuous over clouds about 4 A.M. Band from the Pleiades distinct, but western sky too light to a considerable altitude to allow observation of Gegenschein.

16, 4¼ A.M. Barom. 30.115; attached therm. 56.9; No. 4, 48.5. Yesterday rather clear with thin clouds; evening rather cloudy. Rather clear at 3 A.M. today, but with clouds in the southeast; extensive clouds and haze at 4 A.M.; a little aurora thought to be seen low in the north between 3 and 4 A.M.; zodiacal light also perceptible.

17, 10 A.M. Yesterday cloudy with light rain; evening cloudy.

18, 9¼ A.M. Yesterday cloudy day and evening with a few drops of rain.

19, 9¾ A.M. Yesterday mostly cloudy, somewhat clear towards night; evening mostly cloudy, with rain later.

20, 9¾ A.M. Yesterday cloudy day and evening with some rain.

21, 5½ A.M. Barom. 30.269; attached therm. 53.7; No. 4, 39.7. Yesterday rather cloudy; evening partly cloudy clear about 10 P.M.; no aurora seen; rather clear at 3 A.M. today, but with clouds in the east, and too much haze to observe the zodiac. Clouds rather less between 4h and 5 A.M., afterwards increasing.

21, 11¼ A.M. Barom. 30.313; attached therm. 54.2; No. 4, 50.9; wind 2 NE; clouds 8 M fm 4; gauge 0 ⅛ ounces; 0.011 inches.

22, 11¾ A.M. Barom. 30.284; attached therm. 52.3; No. 4, 54.5. Yesterday mostly (no aurora seen) clear; evening [illegible] at 3 A.M.

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noon afterwards cloudy; mostly cloudy this forenoon.
23, 10¼ A.M. Yesterday mostly cloudy; evening partly clear overhead at times.
24, 9½ A.M. Yesterday cloudy day and evening, with a few drops of rain.
25, 5 A.M. Barom. 29.664; attached therm. 56.8; No. 4, 45.1. Yesterday cloudy day and evening; clearing off gradually after midnight; aurora now slightly suspected; certainly seen by Prof. Pickering.
25, 11¾ A.M. Gauge 0¼ ounces; 0.022 inches. Barom. 29.738; attached therm. 55.3; No. 4, 52.2.
26, 4½ A.M. Barom. 29.812; attached therm. 52.1; No. 4, 38.9. Yesterday mostly clear and cool; evening clear at first, some clouds after 9 P.M.; no aurora seen.
26, 10½ P.M. Day clear, rather warm; evening clear; no aurora seen.
28, 10 A.M. Yesterday clear at first, soon rather cloudy; evening cloudy.
28, 10½ P.M. Day clear, cool; evening clear; no aurora seen.
30, 9¾ A.M. Yesterday cloudy day and evening, becoming warm; a few drops of rain.
30, 10¾ P.M. Day warm, rather clear; evening somewhat cloudy; no aurora seen.
31, 9¾ A.M. Imperfect lunar halo yesterday evening; mostly clear at 4 A.M. today; clouds increasing after sunrise.
Nov. 1, 5 A.M. Barom. 29.999; attached therm. 64.0; No. 4, 61.5. Yesterday warm and cloudy day and evening; clear for a time after sunset; partly clear at times this morning.

Report to Signal Service sent Nov. 1, 1882.

Aurora regularly looked for on clear evenings. Oct. 2, extensive auroral light during the evening among clouds in the north; a few faint streamers about 7h 45m P.M. Oct. 4 (at 4h to 4h 30m ct. M.[see below, "at 3h 45m ct. M."] to white cloud near θ (Theta) Leonis on side opposite (that) from δ (Delta) Leonis; ~~It was apparently auroral light, as~~ it rapidly changed form and brightness, occasionally vanishing and reappearing. ~~No other auroral light seen~~). (At 3h 45m A.M. there was an auroral arch, which was gradually reduced) ~~To the spot of light mentioned~~

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Oct. 8, at 10h 30m P.M., aurora slightly suspected.
Oct. 10, at 10h 45 P.M., aurora suspected; streamers seen later. Oct. 15, at 3h A.M., and later faint, low, irregular aurora. Oct. 16, between 3h and 4h A.M., a little aurora thought to be seen low in the north. Oct. 25, aurora ~~slightly suspected~~ at 5h A.M., ~~was certainly seen~~ Morning auroras most noticed this month than usual, as the observers were often occupied with comet observations late in the night.

Zodiacal Light looked for every clear evening. Suspected, Oct. 3, 9; visible, Oct. 10, 15; perceptible, Oct. 16. Oct. 3, 9h 45 P.M., zodiacal light suspected as far as ρ (Rho) Capricorni or somewhat farther, but following part of Capricornus certainly dark. Oct. 9, at 8h P.M., zodiacal light thought to be visible as far as θ (Theta) Capricorni. Oct. 10, zodiacal light early in the evening about as on Oct. 9, but more distinct. Oct. 13, zodiacal light evident among eastern clouds in the morning. Oct. 15, at 4h A.M., zodiacal light conspicuous over clouds. Oct. 16, between 3h and 4h A.M., zodiacal light ~~also~~ perceptible. Observations on most evenings hindered by moonlight or clouds.

Lunar Halo, imperfect, Oct. 30, in the evening.

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November 1882.

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	30.020	63.0	64.9	49.5	64.0	64.4	64.0	0		2 SW	6 Pm Fm →	1
2	10	30.271	55.6	46.1	44.8	45.2	68.0	46.5	0		2 N	10 Pm	2
3	9¾	30.470	46.6	36.5	29.0	35.9	50.2	37.0	0		2 N.	1 Pr Rs	3
4	10	30.440	49.0	38.1	33.3	37.3	42.7	38.8	0		2 NE	2 Pr Rs R	4
5	9½	30.464	42.3	32.2	26.2	31.8	41.9	33.0	0		2 N	9 Pm Fm L	5
6	9¾	30.316	40.0	36.4	27.8	35.7	36.2	36.4	0		2 NE	9 Pm Fm L	6
7	10	30.334	43.8	38.1	35.2	37.3	41.3	38.2	0¼	0.022	2 N	10 Pm; a little rain	7
8	9¾	30.210	43.5	40.3	35.0	39.5	41.9	40.6	0½	0.044	2 N	10 Pm	8
9	10½	30.123	43.1	41.6	29.8	41.0	43.6	41.6	0⅛	0.011	0 NW	0 Pm Fm	9
10	9¾	30.102	45.1	46.7	36.3	45.8	50.7	46.1	0		1 NW	10 Pm Fm	10
11	9¾	30.315	47.1	42.4	38.2	41.5	54.4	42.3	0		1 N	10 P fog	11
12	9¾	29.958	52.3	59.4	41.3	58.2	58.6	58.2	0⅛	0.011	2 SW	7 P Pr Fm →	12
13	9¾	29.862	55.0	57.4	54.8	56.4	62.4	57.0	0		1 E	10 P	13
14	9¾	29.848	47.7	39.2	34.9	38.5	61.3	39.7	1¾	0.154	2 W	0 Pm Fm	14
15	9½	29.961	43.8	36.3	28.1	35.5	42.6	37.0	0		1 W	10 Pm Fm	15
16	10	30.220	43.3	41.2	30.1	40.3	43.2	41.0	0		1 W	10 Pm	16
17	9½	30.277	43.9	32.8	32.0	32.1	48.5	33.3	2½	0.221	2 N	10 P. snowing	17
18	10	30.232	36.3	25.7	23.8	25.0	33.7	27.2	2⅜	0.210	2 N	5 Pr Fm	18
19	9½	30.017	34.0	23.3	17.1	22.4	29.8	24.7	0		2 N	0	19
20	10¼	29.844	34.1	30.3	20.2	29.5	31.3	30.7	0		2 NW	10 Pr	20
21	10	29.862	35.0	28.9	22.3	28.1	35.4	29.7	0		1 N	0	21
22	9¾	29.799	35.8	31.7	25.1	30.9	36.0	32.0	0		2 N	10 P	22
23	~~9½~~	~~29.720~~	~~41.9~~	~~24.8~~	~~41.2~~	~~42.3~~	~~42.0~~						23
24	9½	29.720	41.4	41.9	24.8	41.2	42.3	42.0	0		1 S	2 P Fm 1	24
25	10	29.905	40.2	35.5	33.0	35.0	46.2	36.0	0		3 NW	0 Fm	25
26	9½	30.091	35.8	28.0	23.2	27.2	37.4	29.0	0		2 W	3 Pr Rs	26
27	10	29.800	35.8	25.8	21.5	25.0	33.4	27.0	2½ see p. 208	0.275	2 NW	10 Pr	27
28	10	30.110	33.0	23.4	15.5	23.0	29.0	24.4	0		1 NW	1 Rs	28
29	10	29.899	32.7	28.6	22.8	28.2	31.4	29.2	0		3 N	10 Pr; snowing	29
30.									see p. 208	0.730			30
	9.8	842.480	1199.2	1052.9	854.8	1031.5	1237.8			1.678	48	175	
		30.088	42.8	37.6	30.5	36.8	44.2		see p. 208	Rainfall for month 1.68 inches	1.7	6.2	
		− .038											
		30.050											

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November 1882.

Date	Time P.M.	Barometer	Attached Thermometer	No. 4	Wind	Clouds.	Time P.M.	Zodiacal Light.	Time P.M.	Aurora.	Report of Signal Service
1	9 1/4	30.116	63.4	55.6	2 W	5 P haze	9 1/4	Cloudy	9 1/4	None	None
2	10 3/4	30.438	51.2	33.1	1 N	0	8	Distinct	10 3/4	None	Aurora
3	9 1/4	30.420	51.0	37.0	0 E	10 P	9 1/4	Cloudy	9 1/4	Cloudy	None
4	8 2/3	30.476	51.3	32.2	1 NE	0	8 3/4	Distinct	8 3/4	None	None
5											None
6											Obsc.
7	11 1/4	30.262	45.2	36.3	2 NE	10 P; a little mist	11 1/4	Cloudy	11 1/4	Cloudy	Obsc.
8	8 1/2	30.152	46.1	38.9	0 NE	0 P	8 1/2	Distinct	8 1/2	None	None
9	9 3/4	30.073	47.7	40.1	0 calm	1 haze	7	Distinct	9 3/4	None	None
10											Obsc.
11	8 1/4	30.185	49.2	47.4	1 SE	0 P haze	8 1/4	Visible	8 1/4	None	None
12	11	29.871	55.6	57.5	0 S	8 P haze	11	Cloudy	11	Suspected	Aurora
13											Obsc.
14	9 3/4	29.849	49.1	35.0	1 SW	1 P 7m haze	9 3/4	Suspected	9 3/4	Arch & streamers	Aurora
15	9 1/4	30.070	47.2	36.2	1 NW	0 haze	9 1/4	Suspected	9 1/4	None	None
16	8 1/4	30.233	47.9		0 calm	0 Rs	8 1/4	Moonlight	8 1/4	Strongly suspected	Aurora
17											Obsc.
18	8 3/4	30.138	36.7	22.8	2 N	0	8 3/4	Moonlight	8 3/4	Suspected	Aurora
19	8 1/4	29.926	37.8	26.1	1 NW	0		Moonlight		None	Aurora
20	8 1/2	29.856	37.1	31.0	2 NW	0 7m	8 1/2	Moonlight	8 1/2	Slightly suspected	Aurora
21											Obsc.
22	11 1/4	29.926	40.1	29.5	0 calm	0	11 1/4	Moonlight	11 1/4	Moonlight	None
23											Obsc.
24	8 1/4	29.687	43.9	35.3	2 SW	0 7m	8 1/4	Moonlight	8 1/4	Moonlight	None
25	8 1/4	30.022	40.5	30.7	1 W	0 7m	8 1/4	Moonlight	8 1/4	Moonlight	None
26											Obsc.
27	9 1/4	29.969	33.3	22.5	2 NW	0	6 1/4	Visible	8 1/4	Moonlight	None
28											Obsc.
29											Obsc.
30	9 1/2	29.995	34.5	17.4	1 SW	0 Pr Rs	9 1/2	Visible	9 1/2	None	None

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November, 1882.

1, 10½ P.M. Day clear and warm; evening somewhat hazy and at times cloudy; no aurora seen.

1, 11 P.M. Moon just rising at about 10¾ P.M., partly concealed by cloudy; eastern sky light, but not much effect of moonlight high up; band from Pleiades visible; a little suspicion of unusual light near the Pleiades, centre about middle of triangle formed by ε, δ, ζ, Arietis; say $2^h 59^m$, +20.0.

2, 11 P.M. Distinct low auroral arch, not seen a quarter of an hour ago. Day clear, cool; evening clear; at 8 P.M. zodiacal light distinct, vertex about ⅓ of the way from β Aquarii to δ Capricorni, joining, or nearly joining, band from Aquila, with dark space between n p side of zodiacal light and the band from Aquila. At 8 P.M. no evidence of Gegenschein; examined regions near 27 Piscium and ζ Piscium, and thought that there were no such masses there as previously seen this autumn; but the band from Aquila has somewhat irregular extensions which need to be well known to make sure of changes. At 11 P.M. perhaps a little suspicion of Gegenschein as yesterday, but very doubtful; centre perhaps farther west than as described yesterday; say half way from ζ to π Arietis; $2^h 55^m$; +18.8 θ Ceti 6/10 from η to ι Ceti in brightness; as usual.

2, 11½ P.M. Aurora irregular with some streamers about 11⅓ P.M.

3, 9¼ P.M. Day clear and cool; some clouds towards night; thin clouds in the evening, covering most of the sky after 8 P.M.; no aurora seen.

4, 11 P.M. Day and evening clear, rather cold; no aurora seen. Zodiacal light distinct early in the evening, with dark space between n p edge and band from Aquila; vertex seemed lower than on Nov. 2, perhaps ⅖ of the way from β Aquarii to δ Capricorni scarcely

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reaching band from Aquila. Band from Aquila has a branch from ν Piscium along line μ, ζ, ε, δ, Piscium to about θ and ι Piscium ν; hereabouts it seems to end; slight dark space between end of this branch and the continuous band below it. Observations of Gegenschein this autumn have perhaps been confused by this branch, but the region does not appear so decidedly bright now as then. Gegenschein tonight not suspected except as Nov. 2; (centre half way from ζ to π Arietis); this may prove to be a permanently bright part of the band.
θ Ceti 0.4 interval η to ι Ceti; much as usual.

6, 9¾ A.M. Yesterday cloudy and cold; evening cloudy at first, clear at 11 P.M., but still somewhat hazy; zodiacal region indistinct; no aurora seen.

7, 10 A.M. Yesterday cloudy and cool day and evening.

7, 11¼ P.M. Day and evening cloudy and cool, with a little rain.

8, 11¾ P.M. Day cloudy and cool; evening rather clear; no aurora seen; haze increasing after 9 P.M. Zodiacal light seen early through Capricornus, but hardly reaching band from Aquila; dark space as usual above n p edge. Region between ζ and π Arietis still appeared bright; probably this is permanent.
Light of θ Ceti as usual.

9, 9¾ P.M. Day clear and rather warm; evening rather hazy; no aurora seen.

11, 9¾ A.M. Yesterday cloudy and cool day and evening; some stars visible at 11 P.M.

12, 9¾ A.M. Yesterday mostly foggy, somewhat chilly; evening clear at times, with frequent thin clouds; no aurora seen; zodiacal light visible early.

12, 11 P.M. Day warm and cloudy; evening mostly cloudy; some stars occasionally seen; much light, probably auroral, among clouds in the north.

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November 1882.

14, 9¾ A.M. Yesterday cloudy and warm day and evening, with occasional rain.

14, 10¾ P.M. Day rather clear and cool; evening cloudy at first, becoming clearer; many thin clouds till about 9½ P.M.; aurora rather bright 9½ P.M. and later with variable arches and streamers; sky sometimes light to the horizon, sometimes dark below arches. Region of $\gamma\,\delta\,\pi$ Arietis as on previous occasions.

15, 10 P.M. Day and evening clear and cool; no aurora seen.

17, 9½ A.M. Yesterday mostly clear and cool; evening clear at first clouds coming on from the southwest about 8½ P.M.; stars near zenith visible about 11 P.M.; from 8 to 9 P.M. either auroral light or faint clouds in the north resembling aurora in the moonlight.

18, 10 A.M. Yesterday cloudy day and evening, with some snow. Gauge this morning probably gives too little rainfall; but much of the snow melted as it fell, and there does not seem to be more than about 3 inches on the ground on the average. It is doubtful whether this ought to be considered as belonging wholly to the last 24 hours.

18, 12¼ P.M. External temperature 29; No. 4 in snow and water reads 32.25

18, 1 P.M. External temperature 29; No. 4, after standing in snow and water since last observation reads 32.3.

18, 2 P.M. External temperature 29; No. 4 still reading 32.3.

18, 11 P.M. Day at first rather cloudy soon clear and cold; evening clear with aurora perceptible in moonlight, and at times distinct with arches and streamers. First noticed about 6¾ P.M.

19, 10¾ P.M. Day and evening clear and cold; aurora visible

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visible most of the evening notwithstanding moonlight; at about 9½ P.M. a fine bright narrow arch through ζ Urs. Maj. with dark sky below, in which η Urs. Maj. was visible.

19, 11¾ P.M. During the last hour, the aurora extended itself considerably in the customary manner, with much reddish light, and horizontal bands in the south, sometimes as much as 60° from the zenith. At 11ʰ33ᵐ strong red light between Cygnus and Cassiopeia. At 11ʰ35ᵐ a tolerably distinct corona round the Pleiades; at 11ʰ40ᵐ Alcyone was the centre of convergence, with red light near on the northern side. Much flashing soon after, followed by the disappearance of the corona.

20, 12½ A.M. At about 12ʰ 5ᵐ a fine auroral curtain in the north, centre nearly over β Draconis, east end under α Urs. Maj., lasting several minutes. Strong red light again between Cygnus and Cassiopeia about 12ʰ 8ᵐ. Imperfect coronae about 12ʰ 10ᵐ and 12ʰ 30ᵐ, centre of first near λ Tauri, of second near ν Tauri. Strong red streamer east of the Dipper about 12ʰ 15ᵐ.

20, 1½ A.M. Aurora continuing, not now remarkable.

20, 10¼ A.M. Aurora flashing very fast, about 1¾ A.M.; reported by S. C. Chandler, Jr., as brilliant at about 3½ A.M. with red light and with bright southern streamers for a short time.

20, 11½ P.M. Day cloudy and cold, evening clear; aurora suspected at times; a few streamers certainly seen at 10ʰ 25ᵐ; some bright streamers seen by A. W. Cutler about 7ʰ 45ᵐ.

22, 9¾ A.M. Yesterday clear, with thin clouds and lunar halo in the evening.

22, 11½ P.M. Day cloudy at first, soon clear; evening clear; no aurora seen.

23, 11 A.M. Barom. 30.019; attached therm. 38.6; No. 4, 36.0; wind 1 S; clouds 1 fm low.

23, 11¾ A.M. Mean 29.7 Mean 29.0 (position set).

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November 1882

24, 9½ A.M. Yesterday mostly clear, evening rather cloudy.

24, 10¾ P.M. Day cloudy at first, mostly clear, cool; evening partly clear; many clouds from the northwest after 9 P.M.; no aurora seen.

25, 10 P.M. Day and evening clear and cold; no aurora seen.

27, 10 A.M. Yesterday clear and rather cold, becoming cloudy; snow in the evening. Snow this morning about 3½ inches deep; 12 inches in cylinder 1⅞ inches across weigh 1½ ounces. 9.7977 8946 .0784 / 0.1781 .2754 / 8.9208 9.4387 .2752 ; hence rainfall to 1 inch of snow 0.0784 inches; total rainfall 0.275 inches. By gauge 0.221 inches; probably too small; direct measure preferred.

28, 10 A.M. Yesterday mostly clear and cold day and evening; no aurora seen; zodiacal light visible early, joining band from Aquila, with dark triangular space above n Ψ edge as usual.

29, 10 A.M. Yesterday mostly clear, becoming cloudy in the evening.

30, 11½ A.M. Barom. 29.851; attached therm. 34.7; No. 4, 27.3; minimum 24.2 (not set); maximum 30.3 (not set); wind 1W; clouds 0. Yesterday cloudy and rather cold with snow day and evening; clearing off about sunrise; clear after about 9 A.M. today. Snow measured in 10 places; 7, 7, 6½, 6, 7, 7, 6½, 6½, 6½, 6; mean 6.60 inches; 20½ inches in cylinder 1 13/16 inches across weigh 3⅜ ounces; 9.8271 4 | 9.0435 4 .1106 / 9.1682 | 0.8195 .730 / 0.52 82 | 9.8630 ; hence rainfall to 1 inch of snow 0.1106 inches; total rainfall 0.730 inches; gauge cleared out.

30, 9½ P.M. Day mostly clear and cold; occasional clouds in the evening; no aurora seen; zodiacal light somewhat visible as on Nov. ~~X~~ 27.

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Report to Signal Service, sent Dec. 6, 1882.

Aurora regularly looked for on clear evenings; Nov. 2, 11 to 11½ P.M., arch and some streamers; Nov. 12, much light in the evening, apparently auroral, among clouds in the north; Nov. 14, aurora rather bright 9½ P.M. and later, with variable arches and streamers; sky sometimes light to the horizon, sometimes dark below arches; Nov. 16, from 8 to 9 P.M., either auroral light or faint clouds in the north resembling aurora in moonlight; Nov. 18, aurora in the evening perceptible in moonlight, and at times distinct with arches and streamers; Nov. 19, very brilliant and extensive aurora beginning before 9 P.M. and seen as late as 3½ A.M. Nov. 20; it often covered the greater part of the sky, forming imperfect coronas at times; much of the light was red, especially in the northwest about midnight, although red light often appeared in other places; a fine auroral "curtain" in the north about midnight with centre nearly over β (Beta) Draconis; the aurora was very variable, often flashing rapidly; Nov. 20, some aurora in the evening, with streamers occasionally visible.

Zodiacal light looked for on clear evenings; seen Nov. 2, 4, 8, 9, 11, 27, 30; suspected Nov. 14, 15; observations on other evenings hindered by moonlight or clouds.

Lunar halo evening of Nov. ~~22~~ 21.

Frosts Minimum thermometer below the freezing point on the mornings of Nov. 3, 5, 6, 9, 15, 16, 18 to 24, 26 to 30. It had not been lower than 33.5 Fahrenheit in October.

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December 1882

Date	Time A.M.	Barometer	attached Thermometer	No. 4	Minimum Grove raised setting		Maximum before raised setting		Gauge	Rainfall in inches	Wind	Clouds	Date
1	10	29.880	31.7	29.1	25.0	28.2	30.3	29.4	0		2 SW	10 P Fm →	1
2	10	29.899	36.8	38.0	28.4	37.1	37.7	37.8	0		1 S	9 P Fm	2
3	9½	29.858	35.0	22.2	21.4	21.4	44.6	24.0	0		2 NW	10 R; snowing	3
4	10¼	30.309	24.9	10.4	3.8	9.9	24.0	13.5	0 1/8	0.011	1 W	0 Rs	4
5	9¾	30.075	32.4	38.8	9.7	38.1	38.6	38.4	0		2 SW	3 P Rs Fm	5
6	8¼	29.696	39.0	48.0	36.2	47.2	48.0	47.3	2½	0.221	3 SW	10 Rm Fm //	6
7	10¾	29.738	40.1	41.0	26.4	40.2	48.2	40.7	0		3 S	10 P	7
8	10¼	30.082	28.2	17.0	12.0	16.4	44.3	18.3	see f. 2 1/2	0.165	3 NW	0	8
9	10¾	30.211	27.2	20.5	11.6	19.8	20.6	21.0	0		2 SW	0	9
10	9¾	29.952	30.3	23.3	19.6	22.8	24.9	24.0	see f. 2 1/3	0.409	1 N	10 R; snowing	10
11	9¾	29.707	31.4	26.9	22.4	26.1	27.3	27.2	see f. 2 1/3	0.260	2 N	10 R; snowing	11
12	9¾	30.136	29.0	20.7	17.8	20.2	29.8	21.5	0 1/8	0.011	2 NW	5 R Rs Fm	12
13	9¾	30.106	26.3	17.9	7.2	17.1	25.0	19.0	0		0 calm	10 R; snow fog	13
14	10	29.542	33.3	29.8	19.1	29.2	39.2	30.7	4¾	0.419	3 NW	0	14
15	9½	29.524	30.0	23.3	19.1	22.8	32.4	29.2	0		2 SW	0 Fm	15
16	10¼	29.620	26.4	14.5	9.5	13.9	25.9	17.0	0		1 SW	0	16
17	10	29.670	25.2	19.5	10.3	19.0	21.5	20.2	0		2 W	3 R Rs Fm ↘	17
18	10¼	30.034	26.2	21.3	13.9	20.7	29.0	21.7	0		1 N	9 P Fm ←	18
19	9¾	30.388	24.7	17.6	11.8	16.8	28.0	18.0	0		1 NW	0	19
20	9¾	30.369	24.7	17.7	12.0	17.1	31.0	18.5	0		1 N	0 Rs	20
21	9½	30.316	27.3	25.7	17.1	25.0	30.5	26.0	0		1 NW	10 P	21
22	10½	30.132	30.3	30.7	24.6	30.1	34.2	30.6	0		1 N	10 P	22
23	10	29.590	35.1	36.0	30.0	35.2	37.0	36.0	7½	0.662	2 N	10 P	23
24	9¾	29.708	33.9	33.7	27.8	33.3	36.0	33.6	0		1 SW	10 P Fm ↘	24
25	9½	30.169	34.6	35.9	30.0	35.2	38.9	35.9	0		1 W	0 P Fm	25
26	10¼	30.139	34.0	30.3	26.3	29.9	38.2	30.5	0		2 NW	8 P Rs Fm →	26
27	9¾	30.066	36.2	29.1	23.8	28.4	34.4	29.7	0		1 NW	0 P	27
28	10	30.136	32.1	26.8	22.1	26.2	34.6	27.4	0		2 NW	1 P Rs Fm	28
29	10½	30.220	29.0	23.2	14.8	23.0	29.4	24.0	0		1 NW	0	29
30	10¼	30.071	30.4	25.3	18.0	25.0	31.0	25.8	0		1 W	0 P haze	30
31	10	30.057	33.2	30.7	24.5	33.2	34.0	33.5	0		1 W	10 P	31
	9.9	929.340 / 29.946 / 30.407	958.9 / 30.9	827.9 / 26.7	584.2 / 18.8	808.5 / 26.1	1028.5 / 33.2	Max. set inside building	see ff. 212, 213.	2.158 Rainfall for month	49 / 1.6	158 / 5.1	

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December 1882

Date	Time P.M.	Barometer	Attached Thermometer	No. 4	Wind	Clouds	Time P.M.	Zodiacal Light	Time P.M.	Aurora	Remarks Sunrise/Sunset
1											Obsc.
2											Obsc.
3	8 1/4	30.046	29.1	10.9	3 NW	0	8 1/4	Distinct	8 1/4	None	None
4											None
5											Obsc.
6	8	30.103	45.4	36.9	0 W	5 P haze	8	Hazy	8	Hazy	None
7	6 1/4	29.792	37.2	20.2	2 W	10 P2	6 1/4	Cloudy	6 1/4	Cloudy	None
8	8 1/2	30.136	29.3	13.7	1 SW	0	8 1/2	Visible	8 1/2	None	None
9											Aurora
10											Obsc.
11											Obsc.
12	8 1/2	30288	29.8	15.5	1 SW	1 P haze	7 1/4	Visible	8 1/2	Hazy	None
13											Obsc.
14	8 3/4	29.509	32.1	26.3	2 SW	5 P haze	8 3/4	Cloudy	8 3/4	None	None
15	8 1/2	29.634	30.7	17.6	1 SW	0	8 1/2	Moonlight	8 1/2	Arch	Aurora
16	6 3/4	29.528	29.7	15.3	1 S	0	6 3/4	Moonlight	6 3/4	Moonlight	None
17											None
18											None
19	7 3/4	30.317	30.6	21.9	1 N	0	7 3/4	Moonlight	7 3/4	Moonlight	None
20	8	30.357	29.9	22.5	1 N	2 P2	8	Moonlight and clouds	8	Moonlight and clouds	None
21											Obsc.
22											Obsc.
23											None
24											None
25											None
26											Obsc.
27											Obsc.
28	8	30.116	32.0	22.6	1 NW	4 P haze	8	Visible	8	None; some clouds	None
29	7 3/4	30.162	34.0	25.5	0 calm	1 haze	7 3/4	Visible	7 3/4	None	None
30	7 1/4	30.005	34.8	29.6	1 W	4 P haze	7 1/4	Visible	7 1/4	None; some clouds	None
31											None

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December, 1862.

2, 10 A.M. Yesterday mostly cloudy, clear for a time towards night; evening mostly cloudy.

3, 9½ A.M. Yesterday mostly cloudy day and evening; warm; becoming colder with snow this morning about 8 A.M. and later.

4, 6¾ A.M. Barom. 30.216; attached therm. 24.0; No. 4, 4.6. Yesterday cloudy at first with a little snow; afternoon and evening clear and cold; no aurora seen; zodiacal light easily visible early in the evening, joining band from Aquila.

5, 9¾ A.M. Yesterday rather clear with some thin clouds; evening somewhat clear early, cloudy at 7 P.M. and later; zodiacal light distinct about 6 P.M.; no aurora seen.

6, 8¼ A.M. Yesterday rather clear and warm; evening cloudy, rain later.

6, 11 P.M. Day cloudy at first, rather warm; clouds diminishing; afternoon pretty clear; evening at first hazy and somewhat cloudy, nearly clear at present; no aurora seen.

7, 5 P.M. ~~At 7 A.M.~~ Day cloudy with rain towards noon, changing to snow about 1 P.M.; water in gauge 1½ ounces at 3½ P.M.; snow in funnel not included.

8, 10½ A.M. Yesterday evening clear after 7 P.M.; no aurora seen; snow of yesterday probably about one inch, but very much scattered and drifted for measure; the gauge has 0⅜ ounces, with the 1½ ounces of rain yesterday, this makes the rainfall 0.165 inches.

9, 2½ A.M. Yesterday clear and cold, day and evening; no aurora seen 8½ P.M. or earlier; broken arch and streamers at 1¾ A.M. today, faint at present. Traces of zodiacal light suspected both east and west; in the west the light seems to mark the altitude of Saturn rising a little above the light

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sky near the horizon on that side, and too wide to be accounted for by the band from the Pleiades Band from Praesepe as usual.

10, 9¾ A.M. Yesterday clear and rather cold till towards night; evening cloudy. Snow this morning about 1½ inches deep.

D, 2½ P.M. Snow 3¾ inches; 10 inches in cylinder 1 13/16 inches across weigh 1 5/8 ounces. Gauge 2¼ ounces; cleared out. 9.8271 / 0.2108 / 0.5740 / 0.6119 / 9.0379 / 0.1091 Hence, by measure, rainfall to 1 inch of snow 0.1091 inches; total rainfall 0.409 inches

11, 9¾ A.M. Yesterday cloudy day and evening, with snow in the forenoon. Snow began again this morning about 7½ A.M.; now snow now about 0½ inches.

11, 4½ P.M. Total depths of snow measured in 5 places: 7¾, 7¾, 7¾, 7, 7½; mean 7.55 inches; 18 inches in cylinder 1 13/16 inches across weigh 2¾ ounces. 9.8271 / 8.9474 / 0.0886 / 8.7447 / 0.8779 / 0.375 / 9.8283 / 0.669 Hence rainfall to 1 inch of snow 0.0886 inches; total rainfall 0.669 inches. Subtracting 0.409 measured yesterday, rainfall today 0.260 inches. Gauge cleared out.

12, 9¾ A.M. Yesterday cloudy day and evening, beginning to clear off about 11 P.M.; a little snow late in the day.

12, 5 P.M. Casella 3235 in use by Professor Rogers, reported broken about this time.

12, 10½ P.M. Day clear, rather cold; evening rather clear, somewhat hazy; no aurora seen; zodiacal light seen early as far as κ Aquarii; band to Pleiades as usual.

14, 10 A.M. Yesterday cloudy, with snow in the middle of the day changing to rain; beginning to clear off about 10½ P.M.

14, 10½ P.M. Day clear and rather cold; evening clear at first, thin clouds coming on after 7 P.M.; no aurora seen.

15, 10½ P.M. Day and evening clear and cold; auroral arch seen 8½ P.M. and later; at 10¼ P.M. arch irregular, sky very dark below; light now spreading below arch; some faint streamers.

17, 10 A.M. Yesterday clear and cold; evening [illegible] cloudy; no aurora seen.

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December 1882.

18, 10½ A.M. Yesterday clear and rather cold day and evening; no aurora seen.

19, 9¾ A.M. Yesterday cloudy at first, mostly clear and cold day and evening; no aurora seen.

20, 9¾ A.M. Yesterday clear and rather cold day and evening; no aurora seen.

21, 9¾ A.M. Yesterday clear and rather cold; evening nearly clear, with thin clouds; no aurora seen.

22, 10½ A.M. Yesterday cloudy and chilly; somewhat clear towards night; evening cloudy.

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

24, 9¾ A.M. Yesterday cloudy, nearly clear about 10½ P.M.; no aurora seen.

25, 9½ A.M. Yesterday mostly cloudy, evening clear; no aurora seen.

26, 10¼ A.M. Yesterday rather clear and cool; evening somewhat cloudy; no aurora seen.

27, 9 3/11 A.M. Yesterday rather cloudy; evening cloudy.

28, 10 A.M. Yesterday clear at first, then rather cloudy; evening cloudy.

29, 10½ A.M. Yesterday rather clear; thin clouds in the evening; no aurora seen.

29, 11 P.M. Day and evening nearly clear; cool; no aurora seen; about 9 P.M. zodiacal light traceable about as far as ν Piscium the cone apparently ending in that neighborhood; the usual band beyond to the Pliades.

Jan. 1, 1883, 11½ A.M. Yesterday rather cloudy and cool; evening cloudy at first, rather clear towards midnight; no aurora seen.

Report to Signal Service, sent Jan. 4, 1883.

Aurora regularly looked for on clear evenings: Dec. 9, broken arch and streamers at 1¾ A.M., faint at 2½ A.M.; no aurora seen the previous evening at 8½ P.M. or earlier. Dec. 15, auroral arch seen 8½ P.M. and later; at 10¼ P.M. arch irregular, sky very dark below; at 10½ P.M., light spreading below arch; some faint streamers.

Zodiacal light distinct Dec. 3, 4; visible Dec. 8, 12, 28, 29, 30; observations on other evenings hindered by moonlight or clouds. On Dec. 9, at 2½ A.M., traces of zodiacal light were suspected both east and west.

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General remarks on Observations for 1882.

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 are probably not the actual maxima and minima. The highest reading of the maximum thermometer (Casella 13399) and the lowest reading of the minimum thermometer (Green 2205), both uncorrected, are also given for each month.

	Barometer. Maxima				Barometer. Minima				Temperature. Max.		Temperature. Min.	
	Date	Time	Barom.	Attached therm.	Date	Time	Barom.	Attached therm.	Date	C.13399	Date	G.2205
January	24	8¼ P.M.	30.660	5.0	31	9 P.M.	29.332	30.7	10	47.0	24	−14.4
February	18	10 A.M.	30.668	25.8	10	9½ A.M.	29.418	33.9	17	50.2	4	0.5
March	8	8¾ P.M.	30.576	37.5	13	9½ A.M.	29.436	39.0	21	55.3	15	14.4
April	6	9 A.M.	30.518	38.0	20	9½ A.M.	29.249	49.1	3	65.8	1	17.6
May	18	9½ A.M.	30.434	49.6	14	9 P.M.	29.492	47.7	28	72.4	3	30.7
June	13	9½ A.M.	30.244	59.1	1	9½ A.M.	29.509	62.0	25	90.9	13	45.0
July	31	9 P.M.	30.380	77.0	29	10 A.M.	29.445	77.3	28	92.6	3	51.9
August	1	10 P.M.	30.351	76.0	9	9 A.M.	29.699	78.1	7	90.4	21	49.8
September	21	10½ A.M.	30.328	66.0	15	10¼ A.M.	29.619	65.5	20	84.0	28	42.4
October	6	9¼ A.M.	30.433	57.8	24	9½ A.M.	29.746	57.1	19	73.0	29	33.5
November	4	8⅔ P.M.	30.476	51.3	24	8¼ P.M.	29.687	43.9	2	68.0	28	15.5
December	20	9¾ A.M.	30.369	24.7	14	8¾ P.M.	29.509	32.1	7	48.2	4	3.8

Range of barometer 30.668 Feb. 18 to 29.249 April 20.
" " temperature 92.6 July 28 to −14.4 Jan. 24.

Observers

A. Searle usually; O. C. Wendell Feb. 1 to 13 inclusive (except Feb. 2, 9½ A.M., Feb. 12, 9½ A.M., Feb. 1, 1¾ P.M., Feb. 6, 1½ P.M., Feb. 9, 10 A.M., Feb. 10, 5½ P.M.); March 2, 10½ P.M.; Aug. 3, 10½ P.M. to Aug. 8, 9½ A.M., and Aug. 19, 11½ A.M. to Sept. 1, 10½ A.M. inclusive; Sept. 18, 11 A.M. to Sept. 23, 9½ 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 this record for each month, the times given in

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the second column is that at which the entire record was made; the columns headed "Time", just preceding 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, as just explained.

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 Q 5, p. 72, for change of place of thermometers in 1879; and this book, p. 50, for regrading of ground about rain gauge.

Thermometer No. 4 — In order to make it possible to examine the freezing point of No. 4 without dismounting it, it was moved on the afternoon of Feb. 11, 1882, from the east to the west side of the wooden shelter protecting the thermometers. Its freezing point was examined Feb. 21, March 17, Nov. 18, with the result 32.3 in each case; (see book Q 5, pages of remarks preceding observations of 1878).

Thermometer Casella 3235. — The standard thermometer Casella 3235, formerly used for comparisons with No. 4 and other thermometers, for which see books Q 4 and Q 5, was in use by Professor Rogers during 1882, and was broken about Dec. 12.

Wind — recorded as in 1880; see pp. 50, 51, of this book.

Clouds — " " " " " p. 51 " " "

Reductions — The barometric means reduced to the freezing point are entered below the uncorrected means; no other corrections are applied. The reductions are largely by Mr. C. L. Eaton.

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Reports to the Signal Service

The results reported monthly to the Signal Service are also recorded in this book; see p. 51.

Gegenschein

A communication to the Astronomische Nachrichten, CII. 263 (No. 2441) contains the results of all observations of Gegenschein made here up to April 18, 1882. These observations begin Feb. 27, 1878. The record in this book contains notes on the zodiacal region in June, July, September, October, and November, 1882, including some notices of Gegenschein.

Phenomena

The spring was backward, and the month of May, 1882, somewhat resembled May, 1868. See p. 168. The rainfall of August was unusually small and that of September unusually large. The autumn was warm and cloudy.

The minimum temperature, —14.4, is lower than any recorded here since 1861, but the minimum of 1873, —13.9, is nearly as low.

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