

TABLE 2.—Vapor pressures at pyrheliometric stations on days when solar radiation intensities were measured.

Washington, D. C.			Madison, Wis.			Lincoln, Nebr.			Santa Fe, N. Mex.		
Date.	8 a. m.	8 p. m.	Date.	8 a. m.	8 p. m.	Date.	8 a. m.	8 p. m.	Date.	8 a. m.	8 p. m.
1918.	mm.	mm.	1918.	mm.	mm.	1918.	mm.	mm.	1918.	mm.	mm.
June 1	20.57	22.00	June 4	10.97	12.68	June 1	10.21	12.68	June 1	3.81	3.30
4	10.59	11.38	7	6.02	6.50	2	10.59	15.11	5	5.79	5.58
5	14.10	14.60	11	13.13	9.47	3	15.65	14.10	7	5.79	8.48
10	11.38	13.61	12	8.81	9.14	11	12.08	7.29	10	8.18	9.14
12	16.20	10.21	14	11.81	9.83	12	10.97	8.48	11	7.04	4.95
15	9.83	9.14	15	7.57	12.68	14	12.68	17.96	12	5.56	7.04
19	9.14	7.04	17	10.21	7.04	15	17.37	15.11	13	7.29	6.76
24	6.27	8.81	21	7.29	9.47	16	13.13	11.81	14	7.29	5.79
27	10.59	12.24	22	4.75	7.57	17	20.57	11.38	15	6.27	4.95
						25	14.10	9.83	24	9.14	7.29
						26	15.65	9.14	26	7.87	4.95
						27	11.81	10.21	27	5.79	4.95
									28	4.57	5.56
									29	4.17	7.04

TABLE 3.—Daily totals and departures of solar and sky radiation during June, 1918.

[Gram-calories per square centimeter of horizontal surface.]

Day of month.	Daily totals.			Departures from normal.			Excess or deficiency since first of month.		
	Washing- ton.	Madi- son.	Lin- coln.	Washing- ton.	Madi- son.	Lin- coln.	Washing- ton.	Madi- son.	Lin- coln.
1918.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.
June 1	603	649	675	110	171	148	110	171	148
2	548	685	676	56	204	144	168	375	202
3	469	254	693	23	230	157	143	145	149
4	660	514	487	169	27	45	312	172	404
5	611	236	550	120	255	3	432	83	407
6	400	384	447	92	110	104	340	193	303
7	302	752	642	191	255	87	140	62	390
8	696	573	669	202	72	110	351	134	500
9	724	538	606	229	34	43	580	168	543
10	629	410	669	133	97	103	713	71	645
11	507	671	666	9	160	95	722	231	740
12	551	753	719	52	239	144	774	470	884
13	615	543	662	115	26	83	889	496	967
14	325	707	652	176	187	99	713	683	1,036
15	723	633	686	221	110	100	934	793	1,136
16	616	544	712	113	18	124	1,047	811	1,260
17	582	674	685	77	145	96	1,124	956	1,356
18	298	355	663	208	177	73	916	779	1,420
19	658	469	538	151	66	52	1,067	713	1,377
20	606	455	411	98	83	180	1,165	630	1,197
Decade departure							452	559	552
21	134	510	714	375	31	123	790	599	1,320
22	462	743	512	48	200	79	742	799	1,241
23	416	705	580	95	160	11	647	959	1,230
24	616	339	432	104	208	178	751	751	1,072
25	114	435	719	399	114	129	352	637	1,301
26	(*)	461	693		88	105		519	1,306
27	(*)	288	697		260	111		289	1,417
28	(*)	585	488		37	90		326	1,321
29	(*)	563	78		16	504		342	817
30	(*)	253	757		294	177		48	994
31									
Decade departure								582	203
Excess or deficiency calories since first of year. (per cent.)							-592	+678	+1,499
							-0.9	+1.0	+ 2.1

\* Register undergoing repairs.

**COBBIGENDUM.**

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Table 1, Santa Fe, N. Mex., last line, "+0.12" should read "-0.12".

A SOUTH PARHELION OBSERVED MAY 1, 1918, AT FRUITA, COLO.

By J. B. WILLSEA, Cooperative Observer.

[Dated: Fruta, Colo., July 2, 1918.]

On May 1, 1918, a south parhelion was seen at this place from 9:15 to 10:48 a. m. (At 10:51 it had vanished.) When last seen it appeared to be about 3½ degrees from the middle of the ring of the accompanying halo. Its disappearance was gradual and no change in the density or other appearance of the cirrus haze was discernible.

NOTE.—Fruta is on the western slope of the Rocky Mountains at an elevation of nearly 1 mile above sea level. Its latitude and longitude are about 39° 10' north and 108° 45' west, respectively. The times given are 90th meridian time or, in other words, they are expressed in what is generally known as "summer time." From these data it has been possible to compute the altitude of the sun at the time of disappearance of the parhelion, and the result gives 50° 08'. This description by Mr. Willsea is, therefore, of considerable interest and importance, confirming as it does other observations of the altitude at which parhelia disappear. (See "The Different Forms of Halos and their Observation" by Besson.)<sup>1</sup> In this case the parhelion gradually diminished in brilliancy and had entirely disappeared when the Sun had reached an altitude between 50 and 51 degrees, although no change in the density of the cirrus clouds was apparent.—*W. R. Gregg.*

LUNAR RAINBOW OF JUNE 24, 1918, AT SALINA, KANS.

By WALTER A. JONES, Cooperative Observer.

I first noticed this phenomenon about 10:15 p. m. and it lasted until 10:40 p. m. (local summer time). The moon was shining brightly in the southeast as a rain cloud approached from the northwest. This cloud was thick and black, with the rain falling gently, and made an ideal setting for the rainbow. The four colors, red, orange, yellow, and green, were easily discernible, and I thought I could distinguish the blue, but it blended with the color of the cloud so closely I could not be certain. Only about three-fourths of the arc was complete on account of the cloud not being high enough. The highest part of the rainbow was about 40° above the horizon.

SOLAR HALO PHENOMENA OBSERVED AT SANTA FE, N. MEX., JUNE 25, 1918.

By CHARLES E. LINNEY, Meteorologist.

[Dated: Weather Bureau Office, Santa Fe, N. Mex., June 25, 1918.]

A rather unusual and beautiful display of halo occurred at this station at 10:25 a. m., 105th meridian time, June 25, 1918. Fine cirrus clouds were passing eastward in rather close formation near the sun, but widely separated farther eastward. At a distance of 22 to 25

<sup>1</sup> MONTHLY WEATHER REVIEW, July, 1914, 42: 433.

degrees from the east rim of the sun a halo appeared, showing probably a third of the circle and beautifully colored, while far down toward the eastern horizon in the midst of the separated groups of cirrus clouds a second line, almost flat, appeared even more brilliant than the near circle. This was so nearly flat that it would have taken a circle of probably  $120^\circ$ -radius to have included it as a segment. The colorings ran red, orange, blue, and green from inside outward, while the smaller circle had principally red and blue. The halos were visible for about 15 minutes and then changing clouds caused them to disappear.

Two of our cooperative observers reported similar phenomena. The observer at Bland, Sandoval County, about 35 miles north of west of Santa Fe, states that on the 25th of June he observed "rainbow clouds from 10 to 11 a. m.," and the observer at (near) Moriarity, Torrance County, about 45 miles south, states that "a double

halo was noted on the 25th with colors of the rainbow, from 10 to 11 a. m." (Standard Time).

NOTE.—The elevation of Santa Fe is 7,013 feet above sea level and its latitude and longitude are  $35^\circ 41'$  N. and  $105^\circ 57'$  W., respectively. From these data and the time of observation given by Mr. Linney the altitude of the sun has been computed to be about  $65^\circ$ . No actual measurements were made, but a sketch furnished by Mr. Linney indicates that the arc observed near the eastern horizon was a circumhorizontal arc, sometimes called the lower tangent arc of the halo of  $46^\circ$ . This report is of considerable interest in view of the small number of observations that have been made of this phenomenon. Besson<sup>1</sup> states that it can be formed only for solar altitudes exceeding  $58^\circ$ , and that only 3 or 4 observations of it are known.—*W. R. Gregg.*

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<sup>1</sup> MONTHLY WEATHER REVIEW, July, 1914, 42: 440.