

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.	3 p.m.	Date.	8 a.m.	3 p.m.	Date.	8 a.m.	3 p.m.	Date.	8 a.m.	3 p.m.
1918.	mm.	mm.	1918.	mm.	mm.	1918.	mm.	mm.	1918.	mm.	mm.
July 1	11.38	9.47	July 1	8.81	9.14	July 1	9.83	9.14	July 9	9.14	7.04
2	7.04	7.04	2	11.38	12.24	2	13.13	13.13	10	7.29	7.04
3	9.83	10.59	5	14.10	14.10	11	6.76	8.48	11	8.48	7.29
6	15.11	12.68	6	9.83	6.76	19	13.13	10.59	12	8.48	6.50
8	9.47	10.21	8	6.27	11.81	24	18.11	17.37	13	8.48	7.04
9	7.29	9.47	10	9.47	9.47	31	12.68	11.81	16	9.14	7.29
15	12.68	14.10	11	10.21	9.14	.....	.....	.....	17	6.27	4.75
16	15.11	14.60	12	10.21	9.14	.....	.....	.....	18	8.18	9.14
20	15.11	16.20	18	11.38	11.38	.....	.....	.....	19	9.14	10.97
23	16.79	16.79	19	13.13	14.60	.....	.....	.....	22	9.14	10.59
24	16.20	16.79	27	15.11	13.61	.....	.....	.....	23	9.14	7.57
25	17.96	14.60	29	11.81	10.21	.....	.....	.....	24	7.29	7.57
.....	.....	.....	30	7.57	7.57	.....	.....	.....	25	9.14	6.27
.....	.....	.....	31	7.04	7.57	.....	.....	.....	26	6.02	9.47
.....	.....	.....	.....	.....	.....	.....	.....	.....	29	8.48	8.48
.....	.....	.....	.....	.....	.....	.....	.....	.....	30	9.14	7.29
.....	.....	.....	.....	.....	.....	.....	.....	.....	31	8.81	9.14

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

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

Day of month.	Daily totals.			Departures from normal.			Excess or deficiency since first of month.		
	Wash- ington.	Madison.	Lincoln.	Wash- ington.	Madison.	Lincoln.	Wash- ington.	Madison.	Lincoln.
July 1.....	690	628	767	181	80	187	181	80	187
2.....	730	645	742	222	100	162	403	180	349
3.....	643	322	681	136	-222	101	539	-42	450
4.....	622	538	310	116	-5	-270	655	-47	180
5.....	306	666	474	-199	124	-106	456	77	74
6.....	608	673	322	-103	133	-257	559	210	-183
7.....	436	673	163	-68	134	-413	491	344	-596
8.....	393	737	708	-110	207	131	381	544	-465
9.....	598	354	347	-65	-182	-229	446	362	-694
10.....	451	674	524	-51	140	-51	395	502	-745
11.....	500	654	696	-1	121	122	394	623	-623
12.....	376	655	494	-125	124	-79	289	747	-702
13.....	338	407	430	-162	-123	-172	107	624	-874
14.....	678	283	379	179	-245	-192	286	379	-1,066
15.....	653	85	395	154	-442	-175	440	-63	-1,241
16.....	600	386	387	102	-139	-181	542	-202	-1,422
17.....	262	492	151	-235	-29	-415	307	-231	-1,837
18.....	586	685	711	-89	167	147	396	-64	-1,690
19.....	354	596	695	-142	81	133	254	17	-1,557
20.....	557	616	710	62	104	150	316	121	-1,407
Decade departure.....							-79	-381	-662
21.....	618	597	634	124	88	76	440	209	-1,331
22.....	567	525	427	74	22	-120	514	231	-1,460
23.....	538	271	452	-46	-232	-102	560	-1	-1,562
24.....	485	253	709	-41	-32	157	554	-248	-1,405
25.....	449	529	564	-41	247	14	513	-216	-1,391
26.....	497	407	653	8	-87	105	521	-308	-1,288
27.....	538	637	676	8	146	130	571	-157	-1,166
28.....	285	300	558	-202	-188	14	369	-345	-1,142
29.....	386	575	737	-100	90	195	269	-255	-947
30.....	231	679	636	-254	197	96	15	-58	-851
31.....	129	645	562	-355	166	24	-340	108	-827
Decade departure.....							-656	-13	+580
Excess or deficiency since first of year.....					(gr.-cal.....)		-932	+786	+672
					(per cent.....)		-1.2	+1.0	+0.7

ABSORPTION AND RADIATION OF THE SOLAR ATMOSPHERE.¹

By S. HIRAYAMA.

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Computations of the transmission and radiation of the solar atmosphere by Schuster's method, using the recent measurements at the Smithsonian Astrophysical Observatory, are compared with the results given by Biscoe from the same material, but neglecting the effect of

radiation of the solar atmosphere. The tables of residuals indicate that the observations are better represented than in Biscoe's table. The coefficient of transmission increases gradually with the wave length. The radiation due to the solar atmosphere is also tabulated; it is about one-third of the whole radiation for short wave lengths, and approaches to one-half as the wave length increases. Assuming the effective temperature of the sun to be 6,000° A., the temperature of the photosphere is calculated to be about 7,040° A., and that of the absorbing layer about 5,210° A.—C. P. B[utler].

INTERNAL TEMPERATURES OF THE SUN.¹

By A. VÉRONNET.

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An investigation is made of the law of densities operating on a gaseous mass of similar nature and at the temperature of the sun, 6,000° A. The variation found would be about 22° per kilometer, indicating that at a certain depth a pressure of 11,000 atmospheres, and a maximum temperature of 60,000° A. would combine to confer on any gaseous masses the potentiality of explosive expansion which when released might produce the surface phenomena with which we are familiar.—C. P. B[utler].

HALO PHENOMENA OBSERVED DURING JULY, 1918.

By WILLIS RAY GREGG, Meteorologist.

[Dated: Aerological Division, Weather Bureau, Aug. 28, 1918.]

During recent years several brief studies of halos in relation to weather² have appeared in the MONTHLY WEATHER REVIEW, and, in addition, there have been published from time to time detailed descriptions, with sketches, of occurrences of the more unusual forms. There has been, however, no systematic observation and recording of halos in such manner as to render them readily susceptible of summarization and intercomparison, without considerable labor on the part of the investigator. Moreover, comparatively few exact readings of angular measurements have been made, and, as pointed out by Besson,³ these measurements are of the utmost importance, particularly in the case of the circum-horizontal arc, tangent arcs of the 22° halo, and other rare forms.

The recent establishment of several aerological stations, well distributed with respect to latitude, longitude, and average cyclonic tracks, makes feasible the inauguration of a statistical study of these optical phenomena, not only with a view to determining the relative frequency of the various forms at different latitudes and by months and seasons and their relation to pressure distribution and precipitation, but also with the hope of adding to our knowledge concerning their angular measurements, distances from the sun or moon, etc. These stations are equipped with theodolites and smoked glasses and are located in country districts, where conditions for observation of this kind are at their best; moreover, the work of obtaining free air records is necessarily conducted in the open, thereby making it easy for observers to keep on the lookout for such phenomena. Accord-

¹ Comptes Rendus, Paris, Jan. 21, 1918, 166:109-111.

² See "Selected Bibliography" at end of paper on "Further Study of Halos in Relation to Weather," by Howard H. Martin, MONTHLY WEATHER REVIEW, Mar., 1918, 46:120.

³ Different Forms of Halos and their Observation, MONTHLY WEATHER REVIEW July 1914, 42:436-446.