SPECIAL OBSERVATIONS.

SOLAR AND SKY RADIATION MEASUREMENTS DURING JULY, 1920.

By HERBERT H. KIMBALL, Meteorologist.

[Solar Radiation Investigations Section, Washington, August 30, 1920.]

For a description of instruments and exposures and an account of the method of obtaining and reducing the measurements the reader is referred to this Review for April, 1920, 48:225.

The monthly means and departures from normal in Table 1 indicate that solar radiation intensities were very close to normal at Washington, D. C., and Madison, Wis., and only slightly above at Lincoln, Nebr. At this latter station the afternoon intensities almost exactly equalled the morning intensities at corresponding air masses, which is unusual. But few measurements were obtained at Santa Fe on account of the absence of the observer from the station during a part of the month.

Table 2 shows an excess in the total radiation received on a horizontal surface at Washington and Madison during the four weeks, July 2 to July 29, inclusive, although at Madison there was a decided deficiency during the week, July 2 to July 8, inclusive.

Skylight polarization measurements obtained at Washington on five different days give a maximum of 57 per cent on the 27th, and a mean for the month of 51 per cent. These are average values for July at Washington. Measurements obtained at Madison on eight days give a maximum of 69 per cent on the 2d and a mean of 55 per cent. The very low polarization of 19 per cent measured on the morning of July 15 brings the average below the normal for July at Madison.

TABLE 1.—*Solar radiation intensities during July, 1920.*

[Gram-calories per minute per square centimeter of normal surface.]

WASHINGTON, D. C.

Date.	Sun's zenith distance.										
	8 a.m.	77.8°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	77.8°	Noon.
	75th meridian time.	Air mass.									Local mean solar time.
		A. M.					P. M.				
	e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
July 1	13.13					1.33	0.96				10.97
9	16.79				1.01	1.25					14.10
13	17.37				0.68						15.11
20	13.13				0.75						12.08
21	15.11				0.66						14.10
23	18.59				0.65						19.23
26	8.48		0.92	1.04	1.23	1.40					8.18
27	9.47		0.87	0.99	1.17	1.35					8.18
28	10.59			0.65	0.84	1.10					11.38
29	12.68				0.84	1.10	0.79	0.62			10.59
30	14.10				0.89						15.65
Means			(0.90)	0.89	0.87	1.26	(0.88)	(0.62)			
Departures			+0.17	+0.05	−0.05	+0.03	−0.09	−0.15			

MADISON, WIS.

July 2	18.59			0.93	1.12	1.36	1.08				17.96
3	14.60		0.91	1.02	1.15	1.37					12.24
10	11.38					1.35					10.59
11	13.61		0.60	0.75							11.81
14	10.21						1.15				8.48
15	11.38				0.64	1.01					9.14
16	9.47				0.96	1.34					8.18
17	9.14		0.59	0.69							12.24
23	17.37						1.05				17.37
26	9.14		0.86	0.96	1.14						8.18
27	9.14		0.66	0.79	0.99						9.83
28	9.14		0.66	0.80	0.95		0.89				9.83
Means			0.71	0.85	0.99	1.29	1.04				
Departures			−0.05	−0.03	−0.01	+0.04	+0.06				

TABLE 1.—*Solar radiation intensities during July, 1920*—Continued.

LINCOLN, NEBR.

Date.	Sun's zenith distances.										
	8 a.m.	77.8°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	77.8°	Noon.
	75th meridian time.	Air mass.									Local mean solar time.
		A. M.					P. M.				
	e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*bal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
July 1	14.10						1.05	0.95	0.85	0.79	17.96
2	13.13			1.01	1.20	1.42	1.08	0.96	0.80		14.10
3	11.81				1.15	1.39	1.19	1.00	0.87		14.10
7	11.38					1.38	1.19	1.03	0.92		10.97
8	9.47		0.95	1.07	1.22	1.41	1.20	1.03	0.89		10.21
9	10.59							1.03			10.59
10	10.97			0.95	1.10	1.40					10.97
13	17.37		0.74	0.91	1.06	1.32	1.00	0.77	0.60		17.37
14	11.81						1.09	0.92	0.76		16.64
15	12.68		0.77	0.90	1.12			0.88	0.73		8.81
18	16.20			0.81	1.01	1.22		0.73	0.58		16.20
22	14.10					1.34	1.13	0.88			14.10
23	15.65			0.96	1.11		1.13	0.96	0.82		17.96
28	12.24		0.65	0.81	1.01	1.31	0.98	0.83	0.68		13.13
31	17.37					1.32					16.79
Means			0.78	0.93	1.11	1.35	1.10	0.92	0.77	(0.79)	
Departures			−0.02	+0.03	+0.02	+0.01	+0.03	+0.03	+0.03		

SANTA FE, N. MEX.

July 28	8.18			1.11	1.26						9.83
Means				(1.11)	(1.26)						
Departures				+0.03	+0.05						

*Extrapolated.

TABLE 2.—*Solar and sky radiation received on a horizontal surface.*

[Gram calories per square centimeter.]

Week beginning—	Average daily radiation.		Average daily departure for the week.		Excess or deficiency since first of year.	
	Washington.	Madison.	Washington.	Madison.	Washington.	Madison.
	cal.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
July 2	544	431	+30	−107	+1,014	−321
9	487	576	−15	+ 45	+ 910	− 7
16	530	555	+41	+ 35	+1,198	+239
23	517	569	+39	+ 72	+1,472	+746

MEASUREMENTS OF THE SOLAR CONSTANT OF RADIATION AT CALAMA, CHILE, JUNE, 1920.

By C. G. ABBOT, Assistant Secretary.

[Smithsonian Institution, Washington.]

NOTE.—The report for June, 1920, having been delayed in transmission, will be published in next issue of this REVIEW.—EDITOR.