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SOLAR OBSERVATIONS.

SOLAR AND SKY RADIATION MEASUREMENTS DURING JULY, 1922.

By HERBERT H. KIMBALL, In Charge, Solar Radiation Investigations.

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.

From Table 1 it is seen that direct solar radiation intensities averaged slightly above the normal for July at Madison, slightly below at Lincoln, and very close to normal at Washington.

Table 2 shows that the total solar and sky radiation received on a horizontal surface averaged below the July normal at Washington. At Madison it averaged above the normal during the first and third weeks, and below the normal during the second and fourth weeks.

Skylight polarization measurements made on seven days at Washington give a mean of 50 per cent with a maximum of 61 per cent on the 29th. These are close to average values for July at Washington. At Madison, measurements made on five days give a mean of 70 per cent with a maximum of 72 per cent on the 3d and 13th. The mean is above the average polarization for July at Madison.

TABLE 1.—*Solar radiation intensities during July, 1922.*

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

Washington, D. C.

Date.	Sun's zenith distance.										
	8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	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 6	14.10	.....	0.69	0.78	1.00	.....	.....	.....	.....	.....	9.83
12	19.89	0.48	0.61	0.75	0.94	1.21	0.96	0.76	0.57	.....	19.89
17	18.59	0.50	0.59	0.75	0.93	.....	.....	.....	.....	.....	19.89
18	17.96	.....	.....	.....	1.02	1.32	.....	.....	.....	.....	18.59
21	13.13	.....	.....	0.67	0.86	1.05	.....	.....	.....	.....	12.24
28	19.23	.....	.....	.....	.....	1.00	.....	.....	.....	.....	17.96
29	12.24	0.69	0.80	0.93	1.05	1.23	.....	.....	.....	.....	12.24
31	14.10	.....	.....	.....	1.01	1.10	.....	.....	.....	.....	12.68
Means	.....	0.56	0.67	0.78	0.97	1.15	(0.96)	(0.76)	(0.57)	.....	.....
Departures	.....	−0.02	−0.02	−0.04	+0.00	+0.04	±0.00	±0.00	−0.08	.....	.....

TABLE 1.—*Solar radiation intensities during July, 1922*—Continued.

Madison, Wis.

Date.	Sun's zenith distance.										
	8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	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	16.79	.....	.....	0.71	.....	.....	.....	.....	.....	.....	16.20
3	8.18	.....	.....	.....	1.26	1.45	.....	.....	.....	.....	8.48
8	11.38	.....	.....	.....	1.21	.....	.....	.....	.....	.....	9.47
13	14.10	.....	.....	1.02	1.19	1.39	.....	.....	.....	.....	15.65
18	10.59	.....	.....	.....	1.20	1.39	.....	.....	.....	.....	13.61
19	11.38	.....	.....	1.03	1.19	1.37	.....	.....	.....	.....	12.68
Means	.....	.....	.....	0.92	1.21	1.40	.....	.....	.....	.....	.....
Departures	.....	.....	.....	+0.03	+0.18	+0.14	.....	.....	.....	.....	.....

Lincoln, Nebr.

July 4	9.83	.....	.....	0.92	1.01	1.17	.....	.....	.....	.....	9.47
5	10.97	.....	0.65	0.77	0.96	.....	.....	.....	.....	.....	14.60
7	11.38	.....	1.01	1.10	1.25	1.42	.....	.....	.....	.....	11.38
8	11.38	.....	.....	0.95	.....	.....	.....	.....	.....	.....	13.61
13	11.81	.....	0.76	0.89	1.10	.....	1.01	0.78	0.61	.....	11.38
15	16.20	.....	.....	0.80	1.00	1.26	.....	.....	.....	.....	16.79
18	11.81	.....	0.81	0.91	1.08	.....	1.05	0.88	0.74	.....	10.59
19	11.38	.....	.....	0.79	1.00	1.22	.....	.....	.....	.....	13.61
25	13.61	.....	.....	.....	.....	.....	1.02	0.84	0.73	.....	18.59
26	17.96	.....	.....	0.89	1.07	1.27	1.07	0.89	0.74	.....	17.37
27	14.60	.....	.....	.....	.....	1.34	1.07	0.87	0.72	.....	14.60
28	15.65	.....	.....	.....	.....	1.08	0.89	.....	.....	.....	17.96
31	13.61	.....	.....	0.92	1.05	.....	.....	.....	.....	.....	25.96
Means	.....	.....	.....	0.81	0.88	1.06	1.25	1.02	0.85	0.71	.....	.....
Departures	.....	.....	.....	+0.1	−0.02	−0.02	−0.08	−0.05	−0.04	−0.04	.....	.....

* Extrapolated.

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

Week beginning.	Average daily radiation.			Average daily departure for the week.			Excess or deficiency since first of year.		
	Washington.	Madison.	Lincoln.	Washington.	Madison.	Lincoln.	Washington.	Madison.	Lincoln.
	cal.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
July 2	452	561	.....	−56	+23	.....	−3094	−1541	.....
9	477	459	.....	−21	−72	.....	−3243	−2048	.....
16	423	522	.....	−64	+ 5	.....	−3690	−2016	.....
23	453	419	.....	−24	−77	.....	−3861	−2556	.....

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

By C. G. ABBOT, Assistant Secretary.

[Smithsonian Institution, Washington.]

NOTE.—Owing to delay in the mails the data from South America will be included in the August issue of the REVIEW.—EDITOR.