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SOLAR OBSERVATIONS.

SOLAR AND SKY RADIATION MEASUREMENTS DURING JULY, 1923.

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 the REVIEW for April, 1920, **48**:225, and a note in the REVIEW for November, 1922, **50**:595.

From table 1 it is seen that direct solar-radiation intensities averaged decidedly below the normal values for July at Washington, D. C., and close to normal at Madison, Wis., and Lincoln, Nebr.

Table 2 shows that about the average amount of solar and sky radiation for July was received on a horizontal surface at all three stations.

Skylight-polarization measurements, obtained at Washington on four days give a mean of 51 per cent, with a maximum of 59 per cent on the 23d. At Madison measurements obtained on four days give a mean of 59 per cent, with a maximum of 61 per cent on the 18th. These are slightly below average values for July at Madison, and close to July averages for Washington.

TABLE 1.—*Solar radiation intensities during July, 1923.*

[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 mer. time.	Air mass.									Local mean solar time.
		A. M.					P. M.				
	e.	5.0	4.0	3.0	2.0	[1] 1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
July 3	11.38	.....	.....	.....	0.93	.....	.....	.....	.....	.....	13.13
5	16.79	.....	.....	.....	0.85	1.06	.....	.....	.....	.....	14.60
17	14.60	.....	.....	.....	0.81	0.97	.....	.....	.....	.....	10.97
18	13.13	.....	.....	.....	0.59	.....	.....	.....	.....	.....	10.21
19	10.59	.....	0.49	.....	.....	1.11	.....	.....	.....	.....	10.21
20	14.60	.....	.....	0.44	0.66	1.05	.....	.....	.....	.....	13.61
21	12.68	.....	.....	0.38	0.82	1.12	.....	.....	.....	.....	9.83
23	7.87	.....	.....	.....	1.02	1.40	.....	.....	.....	.....	6.76
25	17.37	.....	.....	.....	.....	1.14	.....	.....	.....	.....	12.68
26	10.59	.....	.....	0.64	0.81	1.26	1.07	0.89	0.75	.....	9.14
Means	.....	.....	(0.49)	0.49	0.81	1.14	(1.07)	(0.89)	(0.75)	.....	.....
Departures	.....	.....	−0.19	−0.30	−0.09	−0.05	+0.10	+0.12	+0.09	.....	.....

[1] Extrapolated.

TABLE 1.—*Solar radiation intensities during July, 1923*—Continued.

Madison, Wis.

Date.	Sun's zenith distance.										
	8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.0°	75.7°	78.7°	Noon.
	75th mer. time.	Air mass.									Local mean solar time.
		A. M.					P. M.				
	e.	5.0	4.0	3.0	2.0	[1] 1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
July 12	11.81	.....	0.76	0.85	1.07	1.32	.....	.....	.....	.....	11.38
17	9.47	.....	.....	.....	1.09	1.41	.....	.....	.....	.....	8.81
18	10.59	.....	.....	.....	1.05	1.35	.....	.....	.....	.....	10.59
24	16.20	.....	.....	.....	1.04	.....	.....	.....	.....	.....	14.10
25	12.68	.....	.....	0.92	1.05	.....	.....	.....	.....	.....	9.47
Means	.....	.....	(0.76)	(0.88)	1.06	1.36	.....	.....	.....	.....	.....
Departures	.....	.....	±0.00	−0.01	+0.03	+0.10	.....	.....	.....	.....	.....

Lincoln, Nebr.

July 8	16.20	.....	.....	.....	1.11	1.29	.....	.....	.....	.....	12.68
9	17.37	.....	0.78	0.93	1.10	1.33	.....	.....	.....	.....	15.11
14	18.59	.....	.....	0.71	0.93	1.17	.....	.....	.....	.....	16.20
28	9.83	.....	.....	0.91	1.20	1.44	.....	.....	.....	.....	9.14
30	12.68	.....	.....	.....	1.13	1.39	.....	.....	.....	.....	14.60
31	14.60	.....	0.70	0.83	1.01	1.28	1.14	0.93	0.80	.....	12.68
Means	.....	.....	(0.74)	0.84	1.08	1.32	(1.14)	(0.93)	(0.80)	.....	.....
Departures	.....	.....	−0.06	−0.06	±0.00	−0.01	+0.07	+0.04	+0.05	.....	.....

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	526	476	631	+16	−62	+55	−1,989	+927	−68
9	458	515	514	−39	−16	−67	−2,263	+818	−534
16	521	598	604	+37	+85	+33	−2,003	+1,416	−308
23	467	419	490	−6	−72	−60	−2,044	+913	−721