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SOLAR OBSERVATIONS

SOLAR AND SKY RADIATION MEASUREMENTS DURING APRIL, 1926

By HERBERT H. KIMBALL, 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 January, 1924, **52**:42, January, 1925, **53**:29, and July, 1925, **53**:318.

From Table 1 it is seen that solar radiation intensities averaged above April normals at Washington, and slightly below at Madison and Lincoln. At Washington, a noon reading of 1.53 gr. cal./min./cm ²./, on the 9th is slightly higher than any intensity heretofore measured at that station in April, and higher than the maximum that has heretofore been measured in any month except March, 1926.

Table 2 shows that the total solar and sky radiation received on a horizontal surface averaged decidedly above the April normal at all three stations for which normals have been determined. The weekly averages for Chicago are omitted pending a redetermination of the constants of the recording pyrheliometer at that station.

Skylight polarization measurements made at Madison on the 26th, give a polarization of skylight of 60 per cent. At Washington, measurements made on three days give a mean of 65 per cent, with a maximum of 66 per cent on the 16th. These are above the average April values for Washington.

TABLE 1.—*Solar radiation intensities during April, 1926*

[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 A. M.					Air mass P. M.				Local mean solar time
	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.*
Apr. 1	3.81						1.21				2.87
2	3.00					1.43					2.74
9	6.50			1.06	1.26	1.58	1.30				3.81
10	3.63			1.08	1.18	1.47					2.49
12	2.16			0.96							3.30
15	4.37						1.24				3.00
16	4.75	0.72		0.97	1.18	1.44					4.37
20	2.06	0.79	0.89	1.00	1.10						2.06
21	3.99					1.20	0.84				3.45
26	3.81				1.11						3.15
27	4.17		0.44	0.63	0.90						2.87
29	3.99				0.91						3.63
Means		(0.76)	(0.66)	0.95	1.09	1.42	1.15				
Departures		+0.06	−0.09	+0.07	+0.03	+0.07	+0.06				

Madison, Wis.

Apr. 5	2.16			1.19	1.39	1.60					2.03
8	3.15		1.00	1.12	1.30	1.50	1.13				3.00
10	3.81				1.07						5.36
12	2.87			0.80	1.05						3.00
13	2.87				1.16						3.30
15	2.36				1.24						2.74
16	4.57				1.31	1.52	1.13				3.45
19	3.15				1.11	1.33					4.39
26	4.17			1.16	1.33						3.45
30	5.79					1.22					7.04
Means			(1.00)	1.07	1.22	1.43	(1.13)				
Departures			−0.04	−0.02	±0.00	+0.01	−0.09				

Lincoln, Nebr.

Apr. 3	2.16		0.95	0.98	1.29						1.68
12	4.57		0.64	0.89	1.17	1.44	1.22	1.03	0.88	0.77	4.17
13	4.17	0.65	0.74	0.90	1.15	1.38					4.57
14	3.00					1.47	1.28	1.10	0.96	0.85	2.62
15	2.36	0.61	0.72	0.96	1.25	1.51	1.20	0.98	0.81	0.72	2.74
18	3.63	0.63	0.72	0.88	1.17	1.50	1.17	0.92	0.75	0.60	2.87
19	2.74		0.68	0.80	1.28						2.16
28	2.62						0.91				2.26
29	4.57					1.34					4.57
30	8.48	0.52	0.64	0.82	1.04	1.32	1.00	0.79	0.67	0.55	6.76
Means		0.60	0.73	0.89	1.19	1.42	1.13	0.96	0.81	0.70	
Departures		−0.13	−0.09	−0.09	−0.02	−0.02	−0.04	−0.01	−0.02	±0.00	

[1] Extrapolated.

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

[Gram-calories per square centimeter of horizontal surface]

Week beginning—	Average daily radiation					Average daily departure from normal		
	Washington	Madison	Lincoln	Chicago	New York	Washington	Madison	Lincoln
1926	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Apr. 2	370	437	358		250	−24	+82	−73
9	412	545	533		387	+3	+177	+97
16	516	540	564		415	+94	+156	+128
23	466	413	500		318	+39	+8	+38
Excess or deficiency since first of year on Apr. 29						+693	+1,400	−679