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SOLAR OBSERVATIONS

SOLAR AND SKY RADIATION MEASUREMENTS DURING MAY, 1925

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 and January, 1925, **53**:29.

From Table 1 it is seen that solar radiation intensities averaged below normal values for May at all three stations.

Table 2 shows that the total solar and sky radiation received on a horizontal surface averaged above normal at the three stations for which weekly normals have been determined.

At Washington skylight polarization measurements made on 6 days give a mean of 48 per cent, with a maximum of 56 per cent on the 2d. At Madison, measurements made on 9 days give a mean of 49 per cent with a maximum of 60 per cent on the 23d. These are slightly below normal values for May at both stations.

TABLE 1.—*Solar radiation intensities during May, 1925*

Washington, D. C.

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

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	*1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
May 2	5.56			0.79	1.01	1.28					3.81
4	7.57		0.62	0.76	0.98						5.56
8	5.36			0.76	0.96						3.45
15	8.81			0.34	0.56	0.87					9.83
16	10.97		0.41	0.48							12.68
19	8.48	0.59	0.69	0.81	1.06	1.29					7.87
20	9.14		0.48	0.62	0.81	1.10	0.88	0.72	0.52		7.04
21	7.57				0.86						6.27
23	13.51			0.74	0.98	1.26					14.60
27	5.79		0.77	0.94	1.11	1.32					5.56
28	6.27					1.21					7.04
Means		(0.59)	0.59	0.69	0.93	1.19	(0.88)	(0.72)	(0.52)		
Departures		−0.04	−0.12	−0.12	−0.05	−0.09	−0.10	−0.05	−0.17		

TABLE 1.—*Solar radiation intensities during May, 1925*—Contd.

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 mer. 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.*
May 1	3.99					1.42					5.36
2	3.63					1.46					4.75
7	3.30				1.22	1.40					4.37
8	6.02				1.02						5.79
11	3.63				0.98	1.42	1.02				4.37
14	3.99					1.40	0.97				4.57
17	3.81				1.19						4.95
18	5.36					1.38					6.27
19	6.50			0.72	0.92	1.31	1.06				7.29
20	9.14				0.94						12.24
21	9.14					1.02					9.83
23	9.83				1.17	1.35					8.48
25	3.99				1.15	1.43					4.37
26	6.02				0.93	1.44					5.56
28	9.14				1.15						8.18
Means				(0.72)	1.07	1.37	1.02				
Departures				−0.23	−0.04	+0.01	−0.02				

Lincoln, Nebr.

May 1	3.99	0.73	0.81	0.99	1.22	1.51					3.45
4	5.36		0.75	0.91	1.05						3.99
6	3.99	0.43	0.51	0.67	0.90	1.29					3.45
11	4.75			0.86	1.12	1.38					3.15
25	4.37						1.15	0.90	0.75		4.37
Means		(0.58)	0.69	0.86	1.07	1.39	(1.15)	(0.90)	(0.75)		
Departures		−0.13	−0.12	−0.10	−0.07	±0.00	+0.04	−0.03	−0.04		

* 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
	cal.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Apr. 30	439	434	556	340	342	−10	−12	+84
May 7	377	539	467	490	302	−83	+78	−24
14	524	564	537	488	418	+56	+89	+27
21	530	551	658	506	413	+52	+74	+149
28	611	544	471	484	388	+123	+61	−52
Excess or deficiency since first of year on June 3, 1925						−35	+434	+7