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SOLAR OBSERVATIONS

SOLAR RADIATION MEASUREMENTS MADE DURING FEBRUARY, 1929

By HERBERT H. KIMBALL

For references to descriptions of instruments and exposures, and an account of the method of obtaining and reducing the measurements, the reader is referred to this volume of the REVIEW, January, page 26.

Table 1 shows that solar radiation intensities averaged close to normal values for February at Washington and Madison and considerably below at Lincoln.

Table 2 shows an excess in the total radiation received on a horizontal surface at Washington, Madison, New York, and Chicago, and a deficiency at Lincoln.

Skylight polarization measurements obtained on two days at Washington give a mean of 63 per cent with a maximum of 64 per cent on the 4th. These are slightly higher than the corresponding averages for February at Washington. No measurements were obtained at Madison, as the ground was continuously covered with snow throughout the month.

TABLE 1.—*Solar radiation intensities during February, 1929*

[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.*
Feb. 1	1.68		0.54	0.75	1.13		1.23	1.00	0.80		1.37
Feb. 4	1.88	0.70	0.86	1.06	1.29	1.56	1.26	1.01	0.87	0.73	1.96
Feb. 7	4.75	0.73	0.87	1.03							4.37
Feb. 11	1.88						1.03				1.68
Feb. 12	1.88		0.65	0.75	1.05		1.28	1.04	0.87	0.73	1.37
Feb. 18	4.57	0.64	0.83	0.96	1.26						4.75
Feb. 23	1.52		0.72	0.96	1.22						1.32
Means		0.69	0.74	0.92	1.19	(1.56)	1.20	1.02	0.85	(0.73)	
Departures		−0.02	−0.06	−0.05	+0.02		+0.01	+0.05	+0.01	−0.03	

TABLE 1.—*Solar radiation intensities during February, 1929*—Con.

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] 1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Feb. 1	0.48	1.02	1.12	1.27	1.40						0.86
Feb. 2	0.81			1.16							1.12
Feb. 9	0.58		1.08	1.23	1.43						0.86
Feb. 11	0.71		0.88	1.05				1.06			1.19
Feb. 15	1.68	0.92	1.04	1.15							2.87
Feb. 19	0.51						1.44				0.53
Feb. 20	0.28				1.35						0.71
Means		(0.97)	1.03	1.17	1.39		(1.44)	(1.06)			
Departures		+0.02	−0.07	−0.05	+0.02		+0.07	−0.12			

Lincoln, Nebr.

Feb. 9	0.38		1.10	1.27	1.43		1.43	0.91	0.65		0.66
Feb. 10	1.19		1.08	1.24	1.38						1.45
Feb. 11	0.86			0.82	1.32						1.24
Feb. 13	0.96							0.98			1.37
Feb. 15	2.26						1.50	1.19	1.05	0.93	2.36
Feb. 16	2.49				1.38						4.17
Feb. 19	0.71			0.99	1.25						0.86
Feb. 20	1.02	0.88	0.97	1.15	1.34						1.88
Feb. 22	1.12	0.91	1.05	1.17	1.31	1.61	1.39	1.11	1.03	0.83	2.36
Feb. 26	2.16							1.10	0.98	0.91	2.87
Feb. 27	2.16	0.61	0.77	0.94	1.27						3.00
Means		0.80	0.99	1.08	1.34		1.44	1.06	0.93	0.89	
Departures		−0.13	−0.05	−0.12	−0.04		+0.08	−0.11	−0.10	−0.03	

[1] Extrapolated.

TABLE 2.—*Total solar radiation (direct+diffuse) received on a horizontal surface*

[Gram-calories per square centimeter]

Week beginning	Average daily radiation						Average daily departure from normal				
	Washington	Madison	Lincoln	Chicago	New York	Fresno	Washington	Madison	Lincoln	Chicago	New York
1929	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Jan. 29	279	224	135	124	211	213	+77	+31	−92	+39	+71
Feb. 5	176	251	258	134	145	329	−25	+42	−1	+10	+16
Feb. 12	272	219	277	150	188	361	+47	−10	−7	+11	+50
Feb. 19	323	265	283	165	212	402	+67	+12	−24	+9	+32
Excess or deficiency since first of year on Feb. 28							+945	+203	−1,876	+399	+1,036