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SOLAR OBSERVATIONS.

SOLAR AND SKY RADIATION MEASUREMENTS DURING JUNE, 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 below the normal for June at all three stations.

Table 2 shows that the total solar and sky radiation received on a horizontal surface averaged below the June normal at Washington. At Madison it averaged above the normal during the first half of the month and below during the second half.

Skylight-polarization measurements made on two days at Washington give a mean of 44 per cent with a maximum of 51 per cent on the 12th. These are slightly below the respective averages for June. At Madison, measurements made on nine days give a mean of 53 per cent with a maximum of 71 per cent on the 3d. The

mean is below and the maximum above the respective average of these data for June.

TABLE 1.—*Solar radiation intensities during June, 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. A. M.					P. M.				Local mean solar time.
	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.*
June 12	12.24	0.63	0.73	0.86	1.03	1.25					9.47
22	12.24		0.63								9.47
23	7.87					1.35					8.48
30	17.37			0.49	0.73	1.07					17.37
Means		(0.63)	(0.68)	(0.68)	(0.88)	1.22					
Departures		+0.14	+0.02	−0.08	−0.03	−0.04					
Madison, Wis.											
June 1	8.81			1.03	1.18	1.35					7.04
3	8.81				1.20	1.37					8.81
5	11.38				0.86						10.59
7	12.24				0.82	1.06					10.59
12	12.24			1.04	1.23						9.14
14	14.60				1.13	1.33					11.38
23	11.38				0.91	1.23	0.91				15.11
27	12.24				1.09	1.35					11.81
29	12.68			0.75	0.85						12.68
Means				0.94	1.03	1.28	(0.91)				
Departures				−0.02	−0.08	−0.02	−0.15				
Lincoln, Nebr.											
June 2	8.18		0.65		0.92						7.87
3	8.81		0.57		0.96						8.48
6	12.68			0.85	1.05	1.30					10.97
7	13.61		0.65	0.80	1.01	1.31					11.81
13	15.65					1.16	0.90	0.76	0.66		18.59
15	13.13			0.87	1.04	1.25					14.10
17	12.24			1.05		1.40	1.21	1.05	0.91		11.38
20	12.24		0.68	0.83	1.07	1.40	1.04	0.78			9.47
22	12.24		0.77	0.91	1.08	1.32	0.99	0.80	0.65		10.97
23	13.61		0.70	0.85	1.03	1.27	0.80	0.70	0.58		11.81
26	12.68					1.35	1.02	0.77	0.59		13.61
Means			0.67	0.88	1.02	1.31	1.01	0.81	0.68		
Departures			−0.07	−0.06	−0.05	−0.04	−0.08	−0.09	−0.08		

* 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.*
May 28	469	494		−25	+4		−1,891	−1,561	
June 4	469	554		−31	+50		−2,107	−1,208	
11	470	514		−43	−5		−2,408	−1,242	
18	510	495		−11	−38		−2,486	−1,511	
25	433	513		−30	−27		−2,699	−1,699	

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

By C. G. ABBOT, Assistant Secretary.

[Smithsonian Institution, Washington, August 3, 1922.]

In continuation of preceding publications, the following table contains the results for the solar constant of radiation obtained at Montezuma, near Calama, Chile, in April and May, 1922. The values of ρ/ρ sc are given at air mass 2, or if not the air mass is stated. The reader is referred for further statements regarding the arrangement and meaning of the table to the REVIEW for February, August, and September, 1919.

Date.	Solar constant.	Method.	Grade.	Transmission coefficient at 0.5 micron.	Humidity. ρ/ρsc.	Humidity. V. P.	Humidity. Relative humidity.	Remarks.
1922.								
A. M.	*cal.*					*cm.*	*Per cent.*	
Apr. 5	1.916	$M_{2.20}$	S.	0.887	[1] 0.547	0.40	24	Some cirri in east and north; near sun during second bolograph.
	1.929	$M_{1.81}$						
	1.936	$M_{1.46}$						
	1.929	W. M.						
P. M.								
Apr. 6	1.891	$M_{2.5}$	S.	.884	.674	.18	7	Some cirri low in east.
	1.907	M_2						
	1.927	$M_{1.5}$						
	1.917	W. M.						
Apr. 7	1.958	E_6	V. G.	.862	.671	.26	12	Cloudless.
	1.893	$M_{2.5}$						
	1.909	M_2						
	1.921	$M_{1.5}$						
	1.927	W. M.						
A. M.								
Apr. 8	1.938	$M_{1.42}$	S.	.876	[2] .671	.29	13	Do.
	1.943	$M_{1.32}$						
	1.929	$M_{1.25}$						
	1.937	W. M.						
Apr. 9	1.877	$M_{2.69}$	S.	.879	[3] .616	.30	25	Do.
	1.935	$M_{2.28}$						
	1.935	W. M.						
Apr. 11	1.927	$M_{1.86}$	S.	.875	[4] .590	.41	25	Do.
	1.936	$M_{1.63}$						
	1.945	$M_{1.46}$						
	1.933	W. M.						
P. M.								
Apr. 12	1.831	$M_{2.46}$	S.	.872	.474	.40	20	Cirri prevented morning observations. Cumuli over high peaks.
	1.882	$M_{2.06}$						
	1.907	$M_{1.78}$						
	1.886	W. M.						
Apr. 13	1.995	$M_{3.01}$	S.	.870	[5] .386	.41	21	Cirri prevented further observations.
Apr. 18	1.927	$M_{1.63}$	S.	.883	[6] .695	.20	7	Cirri in north and east.
	1.994	$M_{1.50}$						
	1.935	W. M.						
Apr. 19	1.924	$M_{1.40}$	S.	.883	[7] .702	.27	10	Cirri in east and north.
	1.942	$M_{1.31}$						
	1.935	W. M.						
Apr. 22	1.916	$M_{1.66}$	S.	.884	[8] .665	.13	5	Distant cirri in west, north, and east.
	1.921	$M_{1.55}$						
	1.918	W. M.						
Apr. 29	1.911	$M_{1.68}$	S.	.883	[9] .733	.13	50	Small patches of cirrus scattered about sky.
A. M.								
Apr. 30	1.915	$M_{1.92}$	S.	.888	.585	.19	11	Cirri low in east.
	1.909	$M_{1.74}$						
	1.912	W. M.						
P. M.								
May 8	1.910	$M_{2.27}$	S.	.885	[10] .577	.18	11	Cirri low in west.
May 9	1.857	$M_{2.54}$	V. G.	.888	.684	.19	11	Cloudless.
	1.867	$M_{2.01}$						
	1.908	$M_{1.70}$						
	1.886	W. M.						
A. M.								
May 10	1.958	E_6	E.	.875	.725	.16	15	Do.
	1.912	$M_{2.5}$						
	1.934	M_2						
	1.939	$M_{1.5}$						
	1.936	W. M.						
P. M.								
May 11	1.945	$M_{3.8}$	V. G.	.887	.690	.17	10	Do.
	1.917	$M_{3.74}$						
	1.905	$M_{3.69}$						
	1.922	W. M.						
A. M.								
May 12	1.934	$M_{1.61}$	S.	.885	[11] .721	.15	11	Do.
	1.931	$M_{1.50}$						
	1.932	W. M.						
P. M.								
May 19	1.936	$M_{2.34}$	S.	.884	.623	.42	23	Do.
	1.893	$M_{1.94}$						
	1.912	$M_{1.65}$						
	1.918	W. M.						

[1] Air mass 2.20.
[2] Air mass 1.42.
[3] Air mass 2.28.
[4] Air mass 1.86.
[5] Air mass 3.04.
[6] Air mass 1.62.
[7] Air mass 1.40.
[8] Air mass 1.66.
[9] Air mass 1.68.
[10] Air mass 3.27.
[11] Air mass 1.64.