SOLAR OBSERVATIONS

SOLAR AND SKY RADIATION MEASUREMENTS DURING MARCH, 1930

By HERBERT H. KIMBALL, Solar Radiation Investigation

For reference 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, page 26.

Table 1 shows that solar radiation intensities averaged below the normal intensity for March at all three stations.

No skylight polarization measurements were obtained at Madison during the month. At Washington measurements obtained on four days give a mean of 58 per cent and a maximum of 61 per cent on the 5th. These values are close to the corresponding averages for Washington.

NOTE.—The data for Table 2 will appear in the next issue of the REVIEW.

TABLE 1.—*Solar radiation intensities during March, 1930*

[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.*
Mar. 4	1.60		0.68								1.45
Mar. 5	3.15	0.64	0.74	0.90	1.14	1.44					3.00
Mar. 13	3.81		0.68	0.81	0.99	1.27					4.37
Mar. 14	2.36			1.02	1.33						2.06
Mar. 15	1.68	0.63	0.73	0.85	1.02	1.28	0.94	0.71			1.52
Mar. 20	3.99			0.93	1.12	1.46	0.92				3.00
Mar. 21	5.36						1.18				3.15
Mar. 22	1.68					1.50	1.23	0.89			1.96
Mar. 24	4.17	0.54	0.63	0.77	1.03	1.49					5.56
Mar. 26	2.26				0.89						2.26
Mar. 31	3.15		0.59	0.77	1.15	1.36					2.87
Means		**0.60**	**0.68**	**0.86**	**1.08**	**1.40**	**1.07**	**(0.80)**			
Departures		**−0.12**	**−0.12**	**−0.09**	**−0.07**		**−0.06**	**−0.13**			

Madison, Wis.

Mar. 3	1.32		0.90	1.06							1.12
Mar. 4	2.26			1.03	1.33	1.60	1.30				3.63
Mar. 5	2.36		0.98	1.12	1.33	1.59	1.30				2.26
Mar. 7	3.00			0.76							3.81
Mar. 8	2.06			1.12	1.35	1.60	1.36				2.16
Mar. 12	3.00						1.17				3.30
Mar. 13	2.49						1.34				2.16
Mar. 14	2.62						1.11				2.26
Mar. 19	3.15		0.98	1.12	1.27	1.47					3.81
Mar. 20	3.99		0.70	0.89	1.06						2.74
Mar. 21	1.07			1.16	1.33	1.55					0.71
Mar. 24	4.17			0.90	1.21						3.81
Means			**0.89**	**1.02**	**1.27**	**1.56**	**1.26**				
Departures			**−0.14**	**−0.14**	**−0.04**		**−0.03**				

Lincoln, Nebr.

Mar. 2	1.02					1.57	1.37	1.20	1.05	0.88	1.32
Mar. 4	1.60			1.03	1.23	1.55	1.27	1.10	0.96	0.86	1.88
Mar. 5	2.36	0.86	1.02	1.08	1.17		1.29	1.06	0.87	0.65	2.16
Mar. 12	3.15						1.15	0.99	0.82	0.72	3.45
Mar. 13	4.17	0.73	0.83	0.98	1.17		1.07	0.86	0.72	0.57	3.15
Mar. 15	6.50	0.45	0.59	0.74	0.93						8.48
Mar. 19	3.15				1.27		1.29	1.17	0.99	0.90	4.37
Mar. 28	2.16			1.13	1.33	1.55	1.29	1.14	0.99	0.91	2.62
Mar. 29	2.62					1.55	1.33	1.18	1.04	0.91	3.30
Means		**0.68**	**0.81**	**0.99**	**1.18**	**1.56**	**1.26**	**1.09**	**0.93**	**0.80**	
Departures		**−0.15**	**−0.13**	**−0.10**	**−0.09**		**−0.02**	**±0.00**	**−0.01**	**−0.01**	

[1] Extrapolated.

POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. C. S. Freeman, Superintendent U. S. Naval Observatory Data furnished by Naval Observatory in cooperation with Harvard, Yerkes, Mount Wilson, and Perkins observatories. The differences of longitude are measured from central meridian, positive west. The north latitudes are plus. Areas are corrected for foreshortening and are expressed in millionths of sun's visible hemisphere. The total area, including spots and groups, is given for each day in the last column]

Date	Eastern standard civil time	Heliographic			Area		Total area for each day
		Diff. long.	Longitude	Latitude	Spot	Group	
1930	*h m*	°	°	°			
Mar. 1 (Mount Wilson)	12 30	−71.0	4.0	−14.0		579	
		+9.0	84.0	−5.0		180	759
Mar. 2 (Naval Observatory).	12 7	−65.0	357.0	−15.5		664	
		+22.5	84.5	−5.5	123		787
Mar. 3 (Naval Observatory).	11 21	−52.0	357.3	−17.5		880	
		+35.5	84.8	−6.0	108		988
Mar. 4 (Naval Observatory).	11 20	−39.0	357.1	−17.0		1,034	
		+49.0	85.1	−6.0	77		1,111
Mar. 5 (Naval Observatory).	11 15	−26.0	357.0	−17.5		895	
		+62.5	85.5	−6.5	108		1,003
Mar. 6 (Naval Observatory).	11 25	−12.0	357.7	−17.0		864	
		+76.0	85.7	−6.5	93		957
Mar. 7 (Mount Wilson)	12 30	−24.0	331.9	+22.0		6	
		−3.0	352.9	−19.0		218	
		+9.0	4.9	−17.0		558	782
Mar. 8 (Naval Observatory).	14 23	−9.0	332.7	+20.5		12	
		+14.5	356.2	−17.0		679	691
Mar. 9 (Naval Observatory).	11 28	+26.0	356.1	−16.5		586	586
Mar. 10 (Naval Observatory).	12 7	−78.0	238.6	+9.5	9		
		+41.0	357.6	−16.5		509	518
Mar. 11 (Naval Observatory).	15 56	−64.5	236.8	+9.0		46	
		+59.0	0.3	−16.0		494	540
Mar. 12 (Naval Observatory).	10 56	−53.5	237.4	+9.5		31	
		+70.0	0.9	−16.0		370	401
Mar. 13 (Naval Observatory).	11 10	−63.0	214.6	+15.5		185	
		−42.0	235.6	+9.5	12		
		+84.0	1.6	−16.0		386	583
Mar. 14 (Naval Observatory).	10 51	−50.0	214.6	+16.0		93	
		−31.5	233.1	+11.0		22	
		−24.5	240.1	−10.5	3		118
Mar. 15 (Naval Observatory).	11 17	−35.0	216.2	+16.5		31	
		−23.0	228.2	+23.5		31	
		−17.5	233.7	+10.0		31	93
Mar. 16 (Naval Observatory).	10 58	−32.0	206.2	−7.5		6	
		−19.0	219.2	+16.5		31	
		−10.0	228.2	+24.0		31	
		−6.5	231.7	+11.5		370	438
Mar. 17 (Naval Observatory).	11 6	−35.5	189.4	+7.0	15		
		−15.0	209.9	−0.5		62	
		−5.5	219.4	+16.5		19	
		+2.5	227.4	+22.5	6		
		+8.0	232.9	+11.5		494	596
Mar. 18 (Naval Observatory).	11 2	−21.5	190.3	+7.5	12		
		−1.5	210.3	−1.0		93	
		+8.5	220.3	+16.5	3		
		+20.0	231.8	+12.0		370	478
Mar. 19 (Naval Observatory).	11 8	−7.5	191.0	+7.5	12		
		+12.5	211.0	−1.0		93	
		+34.5	233.0	+11.5		340	445
Mar. 20 (Naval Observatory).	11 9	−78.0	107.3	+6.0	62		
		+6.0	191.3	+7.5	9		
		+26.5	211.8	−1.0		77	
		+48.0	233.3	+11.5		216	364
Mar. 21 (Naval Observatory).	11 0	−65.0	107.2	+6.5	12		
		+19.5	191.7	+7.5	3		
		+42.0	214.2	0.0	15		
		+61.5	233.7	+11.5		185	215
Mar. 22 (Naval Observatory).	13 44	−73.5	84.0	+11.0	123		
		−50.0	107.5	+6.0	9		
		+39.5	197.0	+8.5		12	
		+57.0	214.5	0.0	31		
		+80.5	238.0	+10.0	123		298
Mar. 23 (Naval Observatory).	10 58	−61.0	84.9	+11.0	123		
		−31.5	114.4	+2.0		15	
		+20.0	165.9	−5.0	15		
		+69.0	214.9	0.0	6		159
Mar. 24 (Naval Observatory).	11 1	−73.0	59.7	+10.0	77		
		−48.0	84.7	+11.0	123		
		−18.0	114.7	+2.0		15	215
Mar. 25 (Naval Observatory).	12 41	−58.5	60.1	+9.5	62		
		−34.0	84.6	+10.5	108		170