SOLAR OBSERVATIONS

SOLAR AND SKY RADIATION MEASUREMENTS DURING APRIL, 1930

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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 slightly below the normal intensity for April at all three stations.

Table 2 for March shows an excess in the total radiation received on a horizontal surface at Washington, Madison, Lincoln, Chicago, and Twin Falls, and a deficiency at Fresno and La Jolla. For April there was a slight deficiency recorded at Washington, Lincoln, and La Jolla, and an excess at Madison, Chicago, and Twin Falls.

TABLE 1.—*Solar radiation intensities during April, 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.*
Apr. 2	3.81		0.81	1.00	1.10						2.74
Apr. 4	5.36		0.53	0.73	1.07		1.13	0.86	0.61		4.37
Apr. 5	3.15		0.71	0.89	1.11						4.75
Apr. 7	5.56		0.84	1.00	1.18						6.76
Apr. 9	2.16		1.05	1.16	1.28	1.48	1.10	0.77			1.78
Apr. 10	3.99	0.47	0.62	0.75		1.35					2.74
Apr. 15	6.50			0.54							4.95
Apr. 22	7.87				0.97						7.04
Apr. 24	2.62				1.10	1.43	0.90	0.60			2.62
Apr. 25	3.81			0.84	1.07	1.46					4.17
Apr. 26	6.27			0.59	0.83	1.27					4.37
Apr. 29	8.18					1.04	0.76				4.95
Means		(0.47)	0.76	0.83	1.08	1.34	0.97	0.74	(0.61)		
Departures		−0.23	±0.00	−0.06	±0.00	−0.02	−0.12	−0.16	−0.13		

Madison, Wis.

Apr. 1	2.87						1.15				2.62
Apr. 2	3.00		0.82	0.96			1.17				2.62
Apr. 3	3.99		1.01			1.55	1.27				4.17
Apr. 4	3.81		0.72	0.81	1.12	1.42	0.96				4.57
Apr. 7	3.45		0.98	1.11	1.26		1.19				2.26
Apr. 8	2.36			1.22	1.33	1.54	1.23				1.96
Apr. 9	2.62			0.85	1.05						3.45
Apr. 14	4.75			0.77	1.03	1.38					4.57
Apr. 19	2.87			0.96	1.19	1.45					2.26
Apr. 22	2.74			1.06	1.22	1.47					2.36
Apr. 23	1.96			1.03	1.21						2.36
Apr. 24	2.26			1.02	1.20	1.47					3.00
Apr. 25	3.63			0.93	1.09		0.89				3.15
Apr. 26	4.17			0.82	1.08	1.35					3.81
Means			0.88	0.96	1.16	1.45	1.12				
Departures			−0.08	−0.09	−0.05	−0.02	−0.09				

Lincoln, Nebr.

Apr. 1	3.00			0.87	1.21						3.63
Apr. 2	3.45				1.15		1.05	0.78			5.79
Apr. 3	3.99			1.06	1.21		1.06	0.93	0.79	0.71	7.04
Apr. 6	3.45						1.22	1.06	0.90	0.79	4.75
Apr. 7	2.26		1.09	1.19	1.36	1.49					3.30
Apr. 22	4.57				1.19						2.30
Apr. 24	4.17		0.68	0.87	1.07						4.37
Means			(0.88)	1.00	1.20	(1.49)	1.11	0.92	(0.84)	(0.75)	
Departures			+0.04	+0.02	−0.01		−0.06	−0.06	−0.01	+0.03	

[1] Extrapolated.

Skylight polarization measurements obtained on eight days at Washington give a mean of 46 per cent and a maximum of 60 per cent on the 9th. These are slightly below the corresponding averages for April at Washington. At Madison measurements obtained on 11 days give a mean of 58 per cent with a maximum of 70 per cent on the 8th. These are close to the corresponding averages for April at Madison.

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

[Gram calories per square centimeter]

Week beginning	Average daily totals									
	Washington	Madison	Lincoln	Chicago	New York	Pittsburgh	Gainesville	Twin Falls	Fresno	La Jolla
1930										
Apr. 2	339	518	550	393		285	525	423	560	421
Apr. 9	455	341	430	409		332	548	380	569	411
Apr. 16	327	296	333	240		269	519	561	614	475
Apr. 23	478	475	261	407		276	605	491	576	466
	Departures from weekly normals									
Apr. 2	−48	+134	+124	+106				+39	+32	−7
Apr. 9	+56	−60	+14	+97				−44	+3	−32
Apr. 16	−87	−103	−98	−68				+96	+20	+22
Apr. 23	+56	+45	−199	+86				−41	−56	−10
Accumulated departures on Apr. 29	−371	−112	−490	+2,289				+2,261	−799	−2,401

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1930										
Feb. 26	290	299	405	210		150	420	284	266	329
Mar. 5	260	309	380	220		236	367	314	400	339
Mar. 12	369	336	351	220		265	258	300	382	296
Mar. 19	398	283	360	226		292	476	419	511	402
Mar. 26	386	424	504	223		254	483	447	491	378
	Departures from weekly normals									
Feb. 26	+3	+12	+56	+17				+27	−80	−25
Mar. 5	−56	+14	+26	+22				+34	+35	+4
Mar. 12	+41	+13	−21	+10				−10	−23	−40
Mar. 19	+38	−42	−43	+4				+87	+39	+28
Mar. 26	+33	+57	+94	−15				+102	−24	−29
Accumulated departure on Apr. 1	−210	−224	+623	+742				+1,911	−792	−2,212

POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. V. K. Coman, Acting Superintendent U. S. Naval Observatory. Data furnished by Naval Observatory, in cooperation with Harvard, Yerkes, Perkins, and Mount Wilson 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*	°	°	°			
Apr. 1 (Naval Observatory).	11 43	−79.5	307.3	+14.0		278	
		−28.0	358.8	−13.0	6		
		−4.0	22.8	−5.5		370	
		+37.0	63.8	+8.5		77	
		+37.0	63.8	−16.0	28		759
Apr. 2 (Naval Observatory).	10 58	−68.5	305.5	+12.5		617	
		+10.5	24.5	−5.0		401	
		+52.0	66.0	+7.5		77	
		+65.0	79.0	+8.0		93	1,188
Apr. 3 (Mount Wilson)	13 0	−56.0	303.6	+13.0		435	
		−9.0	350.6	−20.0		2	
		+26.0	25.6	−5.0		467	
		+69.0	68.6	+9.0		51	
		+76.0	75.6	+7.0		10	965
Apr. 4 (Naval Observatory).	11 5	−42.5	305.0	+12.5		494	
		+40.0	27.5	−5.5	309		803
Apr. 5 (Naval Observatory).	11 13	−76.0	258.2	+15.5	31		
		−69.5	264.7	−6.5		28	
		−28.5	305.7	+13.0		540	
		+54.0	28.2	−5.0	278		877