TABLE 1.—*Solar radiation intensities during May, 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.*
May 3	4.75	0.69	0.79	0.98	1.19	1.33	0.86				6.02
May 5	5.79	0.50	0.61	0.76	0.98	1.22					7.57
May 7	9.83				0.88	1.20					12.68
May 9	9.83					1.27					6.76
May 10	5.79				0.97	1.28	1.02				6.50
May 13	10.59				1.07	1.26					7.57
May 16	7.29			0.91	1.11						7.29
May 20	8.48				0.76						10.59
May 23	13.13				0.97	1.30					12.24
May 27	4.75		0.92	0.92	1.08	1.38					4.75
May 28	7.57			1.01	1.15	1.47					10.59
May 29	5.36			0.93	1.08						5.36
Means		(0.60)	(0.77)	0.92	1.04	1.30	(0.94)				
Departures		−0.04	+0.06	+0.10	+0.05	+0.01	−0.04				

Madison, Wis.

May 2	6.76				1.22	1.41					5.16
May 3	6.02			0.99	1.14	1.37					5.79
May 5	13.13					1.33					11.38
May 6	14.10				0.97						15.11
May 8	8.18					1.26					4.83
May 17	3.99				1.11	1.23					3.30
May 24	4.17				1.18	1.39					4.57
May 26	4.95					1.26	0.96				5.79
May 31	5.36					1.40					5.56
Means				(0.99)	1.12	1.33	(0.98)				
Departures				+0.04	+0.01	−0.02	−0.07				

Lincoln, Nebr.

May 2	8.48		0.87	1.06	1.20	1.43	1.18	1.00	0.86	0.75	12.24
May 3	11.38		0.84	1.00	1.15	1.34					14.10
May 4	14.10					1.41	1.16	0.99	0.85	0.74	12.68
May 8	8.18				1.18	1.35					10.97
May 24	6.27			0.82	1.10	1.45	1.14	0.97	0.81		6.50
May 25	7.29		0.70	0.88	1.08	1.35	1.03	0.84	0.68		7.29
May 27	8.48			0.80	0.96						11.81
May 30	6.27						1.20	1.04	0.93	0.78	5.79
May 31	7.04			1.06	1.24						10.59
Means			0.80	0.94	1.13	1.39	1.14	0.97	0.83	0.76	
Departures			−0.01	±0.00	+0.01	+0.01	+0.03	+0.03	+0.03	+0.04	

[1] Extrapolated.

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. 30	542	471	469	473	456	438	649	498	493	290
May 7	537	389	422	462	479	510	739	480	686	532
May 14	405	356	371	289	219	263	714	496	599	386
May 21	587	496	564	402	378	515	621	711	735	509
May 28	654	636	564	486	415	465	*626	#707	769	509
	Departures from weekly normals									
Apr. 30	+86	+18	−5	+104	+86	----	----	−75	−133	----
May 7	+75	−75	−60	+78	+111	----	----	−122	+40	----
May 14	−55	−112	−138	−91	−149	----	----	−158	−57	----
May 21	+98	+11	+37	+2	−11	----	----	+6	+40	----
May 28	+145	+142	+43	+64	+5	----	----	+22	+8	----
Accumulated departure on June 3, 1930	+2,072	−224	−1,351	+3,388	+49	----	----	−28	−1,513	----

* 5-day mean. # 6-day mean.

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

LATE REPORTS, MARCH AND APRIL, 1930

NEW YORK

Average daily totals

1930		1930	
Feb. 26	226	Apr. 2	338
Mar. 5	195	Apr. 9	320
Mar. 12	280	Apr. 16	226
Mar. 19	360	Apr. 23	439
Mar. 26	292		

Departures from weekly normals

Feb. 26	−4	Apr. 2	+27
Mar. 5	−65	Apr. 9	−7
Mar. 12	+15	Apr. 16	−104
Mar. 19	+92	Apr. 23	+87
Mar. 26	+13		
Accumulated departure on Apr. 1	−224	Accumulated departure on Apr. 29	−245

POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, U. S. N., 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*	°	°	°			
May 1 (Naval Observatory).	10	55	−6.0	345.0	+11.0	--------	170	--------
			+27.0	18.0	−8.5	--------	12	--------
			+33.0	24.0	+13.0	--------	123	--------
			+40.5	31.5	−7.0	185	--------	490
May 2 (Naval Observatory).	11	14	+8.0	345.6	+11.5	--------	154	--------
			+41.0	18.6	−8.5	--------	12	--------
			+46.5	24.1	+12.5	--------	62	--------
			+54.5	32.1	−7.0	185	--------	413
May 3 (Naval Observatory).	10	55	−51.0	273.6	+17.5	--------	30	--------
			+20.5	345.1	+12.0	--------	123	--------
			+60.0	24.6	+12.5	--------	77	--------
			+67.5	32.1	−6.5	185	--------	416
May 4 (Naval Observatory).	11	5	−36.0	275.3	+16.5	--------	77	--------
			+32.0	343.3	+12.0	--------	108	--------
			+81.0	32.3	−7.0	139	--------	324
May 5 (Naval Observatory).	10	53	−22.0	276.2	+17.0	--------	247	--------
			+44.0	342.2	+13.0	--------	37	284
May 6 (Naval Observatory).	10	52	−9.0	276.0	+17.5	--------	355	--------
			+57.5	342.5	+14.0	15	--------	370
May 7 (Naval Observatory).	10	59	+4.5	276.2	+17.5	--------	463	463
May 8 (Naval Observatory).	11	1	+17.5	275.9	+17.0	--------	509	509
May 9 (Naval Observatory).	10	52	+31.5	276.8	+17.0	--------	463	463
May 10 (Naval Observatory).	10	46	+45.5	277.6	+16.5	--------	463	463
May 11 (Naval Observatory).	11	12	−11.5	207.2	+2.0	--------	19	--------
			+60.0	278.7	+17.0	--------	386	405
May 12 (Yerkes)	15	32	+4.0	207.1	+2.5	--------	181	--------
			+70.0	273.1	+16.5	100	--------	--------
			+78.0	281.1	+15.5	433	--------	714
May 13 (Naval Observatory).	11	5	+15.5	207.8	+2.5	--------	93	--------
			+71.5	263.8	+18.5	--------	31	124
May 14 (Mount Wilson)	12	15	+30.0	208.4	+2.0	--------	105	105
May 15 (Naval Observatory).	10	55	−8.5	157.4	−6.0	--------	37	--------
			+13.0	178.9	+15.5	--------	9	--------
			+42.5	208.4	+3.0	--------	46	92
May 16 (Naval Observatory).	10	55	−72.5	80.2	−11.0	--------	123	--------
			+7.0	159.7	−6.0	--------	46	--------
			+56.0	208.7	+3.0	--------	62	231
May 17 (Naval Observatory).	10	53	−58.5	81.0	−11.0	--------	154	--------
			+23.5	163.0	−6.0	9	--------	163
May 18 (Mount Wilson)	13	0	−46.0	79.1	−11.0	--------	201	--------
			+40.0	165.1	−7.0	8	--------	209

Positions and areas of sun spots—Continued

Date	Eastern standard civil time	Heliographic			Area		Total area for each day
		Diff. long.	Longitude	Latitude	Spot	Group	
1930	h m	°	°	°			
May 19 (Perkins Observatory).	16 28	−73.3	36.3	−7.0	109		
		−29.9	79.7	−11.8		232	341
May 20 (Naval Observatory).	10 51	−62.5	37.3	−6.0	77		
		−18.5	81.3	−10.5		216	293
May 21 (Naval Observatory).	10 55	−48.5	38.0	−5.5	46		
		−5.0	81.5	−10.0		247	293
May 22 (Naval Observatory).	10 47	−36.0	37.4	−6.0	62		
		+8.0	81.4	−10.0		231	293
May 23 (Naval Observatory).	11 5	−72.0	348.0	+14.5		108	
		−59.0	1.0	−11.0		15	
		−30.0	30.0	+19.5		9	
		−22.5	37.5	−6.0	34		
		+22.0	82.0	−10.0		185	
		+45.0	105.0	+26.5		43	394
May 24 (Naval Observatory).	11 8	−59.0	347.7	+13.5		77	
		−45.0	1.7	−11.0		12	
		−14.0	32.7	+19.5	3		
		−9.5	37.2	−6.0	34		
		+36.5	83.2	−9.5		93	
		+56.0	102.7	+27.0	6		225
May 25 (Naval Observatory).	11 5	−46.0	347.5	+13.5		46	
		−31.5	2.0	−12.0	6		
		−2.0	31.5	+19.5		46	
		+2.0	35.5	+25.5		9	
		+4.0	37.5	−6.5	28		
		+50.5	84.0	−9.0		108	243
May 26 (Naval Observatory).	10 50	−32.5	347.9	+13.5		46	
		+11.0	31.4	+19.5		71	
		+16.5	36.9	−6.5	25		
		+64.0	84.4	−9.5	93		235
May 27 (Naval Observatory).	10 54	−24.0	343.2	−1.0		6	
		−20.5	346.7	+12.5		6	
		+25.5	32.7	+19.5		108	
		+30.0	37.2	−6.5	9		
		+79.0	86.2	−9.5	77		206
May 28 (Naval Observatory).	13 8	−73.5	279.2	+16.5	139		
		−14.0	338.7	+13.0		77	
		+40.0	32.7	+19.5		68	
		+44.0	36.7	−6.5	6		290
May 29 (Naval Observatory).	11 21	−60.5	280.0	+16.5	139		
		−20.0	320.5	−2.0		6	
		+0.5	341.0	+12.5		62	
		+52.5	33.0	+20.0		123	
		+58.0	38.5	−7.0		15	345

Positions and areas of sun spots—Continued

Date	Eastern standard civil time	Heliographic			Area		Total area for each day
		Diff. long.	Longitude	Latitude	Spot	Group	
1930	h m	°	°	°			
May 30 (Naval Observatory).	10 46	−48.0	279.5	+16.5	154		
		−6.5	321.0	−2.5		15	
		+15.0	342.5	+12.0	12		
		+66.0	33.5	+20.0		170	
		+70.0	37.5	−6.5	6		357
May 31 (Naval Observatory).	11 6	−34.5	279.6	+17.0	154		
		+6.5	320.6	−2.5	2		
		+29.5	343.6	+12.0	12		
		+85.0	39.1	+20.0		231	399
Mean daily area for May.							327

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR MAY, 1930 [1]

[Data furnished through the courtesy of Prof. W. Brunner, University of Zurich, Switzerland]

May, 1930	Relative numbers	May, 1930	Relative numbers	May, 1930	Relative numbers
1	52	11	*Mc* 22	21	31
2	*a* 52	12	25	22	*b* 33
3	50	13		23	*d* 45?
4	41	14		24	67
5	*Ec* 30	15	32	25	46
6	37	16	*d* 41	26	*Mc* 43
7	*b* 25	17	35	27	56
8	26	18	25	28	*d* 38
9	23	19	31	29	*a* 52
10	19	20	39	30	48
				31	35

Mean, 29 days=37.9.

[1] Dependent alone on observations at Zurich and its station at Arosa.
a=Passage of an average-sized group through the central meridian.
b=Passage of a large group through the central meridian.
c=New formation of a large or average-sized center of activity: E, on the eastern part of the sun's disk; W, on the western part; M, in the central zone.
d=Entrance of large or average-sized center of activity on the east limb.

AEROLOGICAL OBSERVATIONS

By RICHMOND T. ZOCH

The free-air temperatures were above normal at Due West and Royal Center and in the upper levels at Ellendale. At Broken Arrow and Groesbeck and in the lower levels at Ellendale they were below normal. In all cases the departures were small.

The free-air relative humidities were above normal in the lower levels at all of the stations and were below normal in the upper levels.

The free-air vapor pressures were below normal at Broken Arrow but were mostly above normal at the other aerological stations.

In the lower levels the resultant winds were northwesterly on the Pacific coast and southerly in the eastern part of the country. The resultant winds changed to westerly at the 2,000-meter level and remained westerly above this level.

Airplane observations made at Hampton Roads, Va., have been included in Table 2.

TABLE 1.—*Free-air temperatures, relative humidities, and vapor pressures during May, 1930*

Altitude (meters) m. s. l.	Broken Arrow, Okla. (233 meters)		Due West, S. C. (217 meters)		Ellendale, N. Dak. (444 meters)		Groesbeck, Tex. (141 meters)		Royal Center, Ind. (225 meters)	
	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal
TEMPERATURE (° C.)										
Surface	18.6	−1.1	21.6	+1.1	11.6	−1.5	20.4	−2.1	16.5	+0.4
500	17.6	−0.2	19.2	+1.3	11.1	−1.6	19.1	−0.7	14.6	+1.2
1,000	15.1	−0.5	16.4	+1.5	8.0	−1.5	16.5	−0.9	11.6	+1.4
1,500	12.5	−0.9	13.4	+1.5	6.2	−0.4	14.8	−0.8	8.6	+1.2
2,000	10.3	−0.5	9.9	+0.9	4.5	+0.9	12.5	−0.9	5.7	+0.7
2,500	7.9	−0.1	6.7	+0.5	2.2	+1.5	9.5	−1.2	3.0	+0.4
3,000	5.4	+0.5	3.7	+0.5	−0.7	+1.4	5.7	−2.0	0.7	+0.9
4,000	−1.8	−0.5	−2.5	+0.5	−7.5	+0.5			−5.0	+1.3
5,000			−8.4	+1.4	−13.5	+0.6			−11.8	+0.3
RELATIVE HUMIDITY (%)										
Surface	76	+6	66	+2	66	+6	86	+14	70	+6
500	70	+1	66	+1	66	+6	78	+5	69	+5
1,000	68	+1	65	0	66	+7	76	+7	69	+6
1,500	60	−2	63	−2	62	+2	65	+7	68	+7
2,000	47	−12	62	−1	55	−5	52	+3	63	+6
2,500	41	−15	59	−1	55	−4	44	−1	56	+5
3,000	36	−18	55	−2	55	−2	50	+5	49	+2
4,000	26	−29	51	−3	52	−1			44	−2
5,000			49	−3	46	−5			44	−2