TABLE 3.—*Total, I_m, and screened, I_y, I_r, solar radiation intensity measurements, obtained during April 1935, and determinations of the atmospheric turbidity factor, β, and water-vapor content, w=depth in millimeters, if precipitated*

BLUE HILL METEOROLOGICAL OBSERVATORY OF HARVARD UNIVERSITY

Date and hour angle	Solar altitude	Air mass	I_m	I_y	I_r	β_{Im-r}	β_{Iy-r}	β_{mean}	$\frac{I_{w=0}}{1.94}$ (Percentage of solar constant)	$\frac{I_{w=0}-I_m}{1.94}$ (Percentage of solar constant)	w	Air-mass type
Apr. 3, 1935	° ′	*m*	*gr. cal.*	*gr. cal.*	*gr. cal.*						*mm*	
3:19 a. m.	32 29	1.86	1.200	0.827	0.691	0.063	0.116	0.090	68.0	6.1	6.9	P_c
3:00 p. m.	35 35	1.75	1.365	.966	.760	.026	.024	.025	82.2	11.8	8.1	
4:49 p. m.	16 33	3.49	1.061	.775	.652	.036	.071	.054	60.5	5.8	3.6	P_c
Apr. 6												
2:57 a. m.	36 52	1.66	1.270	.898	.713	.049	.080	.064	70.9	5.2	7.4	P_c
2:37 a. m.	40 03	1.55	1.316	.913	.744	.054	.088	.071	74.7	6.8	8.5	
0:16 p. m.	54 00	1.24	1.442	.992	.799	.054	.075	.064	79.7	5.3	10.0	P_c
Apr. 7												
0:33 a. m.	53 42	1.24	1.457	1.007	.810	.041	.067	.054	81.2	5.9	10.2	P_c, T_A aloft
1:05 p. m.	51 39	1.27	1.385	.965	.772	.058	.075	.066	79.1	6.6	10.3	
3:23 p. m.	32 54	1.84	1.255	.905	.731	.058	.077	.068	72.1	7.3	7.2	
3:46 p. m.	28 57	2.06	1.189	.862	.690	.056	.058	.057	71.8	10.4	6.8	P_c
Apr. 15												
3:03 a. m.	38 20	1.61	1.331	.914	.720	.027	.041	.034	81.0	11.9	8.9	
2:44 a. m.	42 18	1.48	1.357	.925	.725	.024	.044	.034	82.1	11.7	9.6	NP_c, T_M aloft
0:40 a. m.	56 14	1.20	1.364	.931	.738	.049	.076	.062	80.7	9.9	13.1	
0:08 a. m.	57 21	1.19	1.442	.968	.769	.035	.065	.050	82.4	7.6	11.1	
Apr. 18												
3:18 a. m.	36 40	1.67	1.250	.907	.701	.077	.075	.076	72.2	7.3	7.9	P_c, NP_c aloft
2:43 a. m.	42 34	1.48	1.335	.917	.743	.042	.072	.057	78.0	8.4	9.1	
Apr. 20												
0:32 a. m.	58 23	1.18	1.500	1.011	.803	.019	.025	.022	86.9	8.8	11.9	NP_c
April 21												
3:31 a. m.	35 32	1.72	1.330	.952	.755	.041	.036	.038	79.4	10.2	7.5	NP_A
Apr 25												
2:58 p. m.	41 46	1.50	1.273	.890	.725	.067	.088	.078	74.4	8.0	9.0	NP_c
Apr. 26												
3:14 a. m.	35 14	1.58	1.416	.968	.786	.025	.069	.046	78.8	4.9	7.7	NP_c
1:44 a. m.	53 24	1.25	1.445	.980	.785	.027	.040	.034	84.3	8.9	11.4	
Apr. 27												
2:26 a. m.	47 59	1.34	1.173	.809	.653	.096	.144	.120	70.6	9.3	10.3	NP_c
Apr. 28												
1:28 p. m.	56 59	1.19	1.257	.839	.669	.065	.125	.095	76.1	10.4	11.7	NP_r
3:30 p. m.	36 52	1.66	.957	.698	.567	.147	.164	.156	61.0	11.0	8.4	P_c
Apr. 29												
3:16 a. m.	39 35	1.57	1.285	.884	.708	.042	.075	.058	76.3	9.2	8.7	NP_c
2:46 a. m.	44 38	1.42	1.344	.918	.729	.039	.064	.052	79.6	9.3	9.6	
0:02 p. m.	62 06	1.13	1.400	.950	.750	.050	.060	.055	82.3	9.1	13.1	
0:35 p. m.	61 06	1.14	1.405	.950	.750	.036	.075	.056	81.9	8.4	11.8	
2:39 p. m.	45 54	1.39	1.273	.889	.702	.061	.067	.064	77.8	11.3	10.2	P_A, T_c aloft

Atmospheric conditions during solar radiation measurements. Blue Hill Observatory of Harvard University

Date and time from apparent noon	Air temperature	Wind (Beaufort scale)	Visibility (scale 0–10)	Sky blueness	Cloudiness and remarks
April 1935	°C.				
3; 2:45 a. m.	3.9	NW 5	8–9	8	Few Acu, 5 Cu, light haze.
3; 0:14 p. m.	4.4	NW 6	8–9	9	3 Cu, Stcu, light haze.
3; 2:45 p. m.	6.1	NW 7	9	9	6 Cu, Stcu, no haze. Gusty. Wind variable.
4; 0:28 p. m.	6.1	W 3	8–9	8	3 Acu, 2 Cu, light haze.
6; 2:54 a. m.	1.7	NNW 5	7–9	9	Few Ci, moderate haze. Wind steady. Varying smoke.
6; 0:09 a. m.	3.9	NxW 5	9	9	Few Ci, light haze. Wind rising gusty.
6; 0:03 p. m.	3.9	NxW 5	9	9	Do.
6; 1:41 p. m.	5.0	NW 5	9	10	4 Ci, light haze.
7; 0:50 a. m.	2.8	N 3	9	12	4 Ci, no haze. Smoke from N. Audibility good.
7; 1:18 p. m.	5.6	NE 3	9	12	1 Ci, light smoke N.
7; 3:29 p. m.	6.1	ESE 1	9	[1] 5	Few Ci.
15; 3:00 a. m.	7.8	WNW 3	8	11	3 Acu, few Stcu, moderate water haze.
15; 0:31 a. m.	12.8	SSW 4	8	10	Few Ci, Dist, 2 Cu, light haze.
18; 3:01 a. m.	3.3	NW 5	7–8	9	Few Cicu, 4 Acu, few Cu, moderate haze.
20; 1:14 a. m.	13.3	NW 5	9	[1] 5	4 Ci, 5 Cu.
20; 0:20 a. m.	13.9	NW 5	9	[1] 5	Do.
26; 3:30 a. m.	10.0	NW 5	8–9	11	Few Ci. Wind gusty. Light haze.
26; 1:09 a. m.	12.2	NW 5–6	9	11	2 Ci, light haze. Gusty.
28; 3:13 a. m.	18.3	WSW 5	7	7	Few Frcu, heavy haze. Gusty, wind rising.
28; 1:25 p. m.	23.6	W 7	8	3	2 Ci, 1 Cu, heavy haze.
29; 3:14 a. m.	12.2	E 4	8–9	10	1 Ci, no haze.
29; 0:17 p. m.	15.6	NE 4	8–9	10	Few Ci, few Frcu, no haze.
29; 2:42 p. m.	18.3	S 5	8–9	11	Few Ci, few Cu, no haze.

[1] Observation by Towle; others by E. M. H.

POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, U. S. Navy, Superintendent U. S. Naval Observatory. Data furnished by the U. S. Naval Observatory in cooperation with Harvard and Mount Wilson Observatories. The difference in longitude is measured from the central meridian, positive west. The north latitude is positive. Areas are corrected for foreshortening and are expressed in millionths of the sun's visible hemisphere. The total area for each day includes spots and groups]

Date	Eastern standard time	Heliographic: Diff. in longitude	Heliographic: Longitude	Heliographic: Latitude	Area: Spot	Area: Group	Total area for each day	Observatory
1935	*h m*	°	°	°				
Apr. 1	11 30	(1)	(1)	(1)				Mt. Wilson.
Apr. 2	11 34	(1)	(1)	(1)				U. S. Naval.
Apr. 3	13 29	(1)	(1)	(1)				Do.
Apr. 4	9 40	(1)	(1)	(1)				Mt. Wilson.
Apr. 5	9 15	(1)	(1)	(1)				Do.
Apr. 6	11 15	(1)	(1)	(1)				Do.
Apr. 9	13 35	+5.0	304.2	+25.0		24		Do.
		+27.0	326.2	−21.0		12	36	
Apr. 10	13 15	+18.0	304.2	+25.0		21		Do.
		+40.0	326.2	−21.0	3		24	
Apr. 11	13 21	+36.0	308.9	+24.0		15	15	U. S. Naval.
Apr. 12	13 10	−64.0	195.8	−28.0		8		Mt. Wilson.
		−39.0	220.8	−36.0		23		
		+50.0	309.8	+25.0		12	43	
Apr. 13	12 30	−54.0	193.0	−27.0	10			U. S. Naval.
		−26.5	220.5	−35.0		123		
		+64.0	311.0	+24.0		15	148	
Apr. 14	13 47	−14.0	219.0	−36.0		231	231	Do.
Apr. 15	11 40	−2.0	219.0	−36.0		293	293	Do.
Apr. 16	13 7	+10.0	217.0	−35.0		231	231	Do.
Apr. 17	11 1	+22.0	217.0	−35.0		216	216	Do.
Apr. 18	11 24	+34.0	215.5	−35.0		170	170	Do.
Apr. 19	11 10	+50.0	218.5	−35.0		154	154	Do.

[1] No spots.

POSITIONS AND AREAS OF SUN SPOTS—Continued

Date	Eastern standard time	Heliographic: Diff. in longitude	Heliographic: Longitude	Heliographic: Latitude	Area: Spot	Area: Group	Total Area for each day	Observatory
Apr. 20	10 50	+60.5	215.9	−35.0	147		147	Do.
Apr. 21	13 15	−54.0	86.9	−36.0		3		Mt. Wilson.
		+76.0	216.9	−35.0	283		286	
Apr. 22	13 9	(1)	(1)	(1)				U. S. Naval.
Apr. 23	10 56	−59.0	56.7	−21.5	10		10	Do.
Apr. 24	11 19	−45.0	57.3	−20.5	8		8	Do.
Apr. 25	11 30	(1)	(1)	(1)				Do.
Apr. 26	11 0	(1)	(1)	(1)				Do.
Apr. 27	11 17	(1)	(1)	(1)				Do.
Apr. 28	13 38	(1)	(1)	(1)				Do.
Apr. 29	10 14	−71.5	325.3	−25.5		73	73	Harvard.
Apr. 30	11 9	−70.0	313.1	+23.0	69			U. S. Naval.
		−57.5	325.6	−22.5		31	100	

[1] No spots.

NOTE.—Mean daily area for April, 78.

PROVISIONAL SUN-SPOT RELATIVE NUMBERS, APRIL 1935

(Data dependent alone on observations at Zurich and its station at Arosa)

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

April 1935	Relative numbers	April 1935	Relative numbers	April 1935	Relative numbers
1	0	11	16	21	15
2	0	12	*Ec* 22	22	16
3	0	13	34	23	9
4	7	14	30	24	7
5	0	15	*b* 37	25	8
6	0	16	29?	26	0
7	0	17		27	0
8	*Mc* 11	18	20	28	0
9	*a* 24	19	11	29	*d* 8
10	22	20	16	30	*d* 16

Mean, 29 days=12.3.
a=Passage of an average-sized group through the central meridian.
b=Passage of a large group or spot through the central meridian.
c=New formation of a center of activity: E, on the eastern part of the sun's disk; W, on the western part; M, in the central circle zone.
d=Entrance of a large or average-sized center of activity on the east limb.

AEROLOGICAL OBSERVATIONS

[Aerological Division, D. M. LITTLE, in Charge]

By L. T. SAMUELS

At those stations which have a sufficient period of record to determine approximate normals, free-air temperatures during April averaged below normal, except at Pensacola and in the higher levels at San Diego, Omaha, and Norfolk. (See table 1.) Mean temperatures for April at Seattle and Spokane were higher than those at Boston below 3,000 meters, but above this level the temperatures at Boston averaged higher.

Free-air relative humidities averaged above normal at all stations except Boston, with the largest departures occurring at Norfolk. Mean free-air relative humidities for April were high in the upper levels over Murfreesboro compared to surrounding stations.

The directions of the resultant winds for the month at 1,000 meters contained greater northerly components than normal over the northeastern part of the country, with resultant velocities normal at all stations.

At 3,000 meters, the directions were generally close to normal, except at a few stations in the northeast and on the Pacific coast where northerly components predominated. Velocities were mostly above normal, except over the Great Lakes region and the extreme northwest.

At 5,000 meters, the directions were generally close to normal, except at a few more northern stations where northerly components were predominant, and on the California coast where greater southerly components prevailed. Velocities were close to normal except at San Diego and Salt Lake City, where large positive departures occurred, and at Cheyenne and Chicago, where large negative departures occurred.

TABLE 1.—*Mean free-air temperatures and relative humidities obtained by airplanes during April 1935*

TEMPERATURE (° C)

Stations	Altitude (meters) m. s. l.: Surface Mean	Surface Departure from normal	500 Mean	500 Departure from normal	1,000 Mean	1,000 Departure from normal	1,500 Mean	1,500 Departure from normal	2,000 Mean	2,000 Departure from normal	2,500 Mean	2,500 Departure from normal	3,000 Mean	3,000 Departure from normal	4,000 Mean	4,000 Departure from normal	5,000 Mean	5,000 Departure from normal	Number of observations
Billings, Mont.[1] (1088 m)	−0.3						1.9		0.1		−2.9		−6.1		−12.7		−19.2		29
Boston, Mass.[2] (6 m)	5.9	−1.1	3.9	−0.4	1.3	−1.1	−1.2	−2.0	−3.3	−2.0	−5.3	−1.8	−7.1	−1.3	−11.3	−0.6	−17.6	−0.7	16
Cheyenne, Wyo.[1] (1873 m)	0.1								1.1		1.3		−1.8		−8.2		−15.2		28
Fargo, N. Dak.[1] (274 m)	1.1		1.9		1.2		−1.1		−3.1		−5.2		−7.5		−12.4		−18.4		30
Kelly Field (San Antonio), Tex.[3] (206 m)	17.3		17.9		17.2		16.3		14.3		11.6		8.0		0.7		−6.2		28
Lakehurst, N. J.[4] (3 m)	5.3		5.8		3.9		1.6		−0.5		−2.8		−4.9		−9.2		−14.2		22
Maxwell Field (Montgomery), Ala.[3] (52 m)	15.6		16.8		14.5		11.5		9.0		6.6		3.4		−2.9		−9.7		25
Mitchel Field (Hempstead, L. I.), N. Y.[3] (29 m)	6.1		6.2		3.9		1.8		−0.3		−2.6		−4.8		−10.1		−16.2		26
Murfreesboro, Tenn.[1] (174 m)	11.0		12.0		10.7		8.3		6.1		3.6		1.1		−4.9		−11.6		30
Norfolk, Va.[4] (10 m)	11.2	−0.6	10.9	−0.5	9.2	−0.1	6.8	−0.1	4.6	+0.1	2.2	+0.2	−0.4	+0.3	−5.5	+0.4	−11.1	+0.4	21
Oklahoma City, Okla.[1] (391 m)	10.8		10.9		10.6		10.7		8.9		5.9		2.3		−5.2		−13.0		29
Omaha, Nebr.[1] (300 m)	5.9	−1.0	6.4	−1.2	5.8	−1.5	4.4	−1.1	2.9	−0.4	0.9	+0.1	−2.0	0.0	−8.2	+0.1	−15.0	+0.4	30
Pearl Harbor, Territory of Hawaii[4] (6 m)																			
Pensacola, Fla.[4] (24 m)	18.8	+0.8	17.4	+0.8	16.1	+1.4	14.4	+1.8	12.6	+2.1	10.2	+2.3	7.9	+2.7	2.0	+3.3	−4.4	+3.5	25
San Diego, Calif.[4] (10 m)	13.1	−2.9	12.2	−1.2	11.7	−0.8	10.2	−0.5	8.3	−0.5	6.4	+0.3	4.7	+1.2	−0.1	+1.9	−7.3	+1.9	30
Scott Field (Belleville), Ill.[3] (135 m)	7.0		9.6		7.4		6.0		4.7		2.8		0.4		−5.5		−12.2		23
Seattle, Wash.[4] (25 m)	4.6	−5.0	5.4	−2.6	3.5	−2.0	0.6	−2.1	−2.3	−2.1	−5.0	−2.2	−7.5	−2.1	−12.8	−1.9	−19.4	−1.9	30
Selfridge Field (Mount Clemens), Mich.[3] (177 m)	3.0		4.6		2.3		0.5		−0.9		−2.3		−4.6		−10.0		−16.5		29
Spokane, Wash.[5] (596 m)	5.6				3.6		1.3		−1.8		−5.0		−8.0		−13.6		−20.1		30
Sunnyvale, Calif.[4] (10 m)	12.6	−1.7	10.8	−0.7	9.3	−1.0	7.1	−1.5	4.8	−1.7	2.1	−1.7	−1.0	−1.5	−6.9	−1.1	−13.3	−1.1	26
Washington, D. C.[4] (13 m)	9.1	−1.6	8.9	+0.1	5.6	−1.0	3.8	−1.1	2.0	−1.2	0.1	−1.7	−2.4	−2.7	−7.2	−2.5	−13.3	−2.5	23
Wright Field (Dayton), Ohio[3] (244 m)	5.7		7.1		6.3		4.2		2.2		0.3		−1.8		−6.9		−13.1		26

[1] Weather Bureau. [2] Massachusetts Institute of Technology. [3] Army. [4] Navy. [5] National Guard.