TABLE 3.—*Solar-radiation measurements, and determinations of atmospheric turbidity factor, β, Washington, D.C., June 1933*

[Values in italics have been interpolated]

Date and solar-hour angle	Solar altitude, *h*.	Air mass, *m*.	I_m	I_y	I_r	β	Blueness of sky	Atmospheric dust particles per cubic centimeter	Notes: (sky-light polarization, P.) clouds, etc.
June 7									
			gr. cal.	*gr. cal.*	*gr. cal.*				
5:07a	24-02	2.45	0.673	*0.551*	0.442	0.190		766	
4:57a	25-58	2.28	.748	.508	*.447*	.145	5		P=36.8%
4:08a	25-26	1.71	.859	.642	*.571*	.195			
4:01a	36-44	1.67	.885	*.647*	.532	.195			
3:18a	45-12	1.41	.968	.717	.570	.195			
3:12a	45-56	1.39	.991	.718	*.576*	.190			
June 14									
5:59a	14-30	3.94	.916	.709	*.597*	.065		296	
5:55a	15-14	3.77	.942	*.714*	.600	.060			
5:33a	19-23	2.99	1.038	*.776*	.636	.060			
5:27a	20-30	2.84	1.047	.779	*.641*	.060			
5:15a	22-50	2.57	1.153	.830	*.658*	.045			
5:09a	23-56	2.46	1.170	*.835*	.662	.045			
4:50a	27-34	2.15	1.162	*.879*	.679	.070			
4:44a	28-42	2.08	1.213	.883	*.684*	.060	6		P=52.0%
June 15									
5:56a	15-07	3.79	.853	.703	*.505*	.050		548	
5:52a	15-52	3.63	.910	*.708*	.508	.038			
5:29a	20-22	2.85	1.006	*.776*	.634	.080			
5:25a	20-58	2.78	1.019	.779	*.636*	.080			
5:21a	21-43	2.69	1.031	.803	*.649*	.085			
5:16a	22-39	2.59	1.031	*.808*	.652	.090			
4:54a	26-52	2.20	1.093	*.854*	.676	.160			
4:48a	28-02	2.12	1.119	.856	*.677*	.170			
4:44a	28-43	2.07	1.125	.846	*.685*	.175			
4:39a	29-43	2.01	1.125	*.849*	.688	.180	5		P=46.0%

POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, Superintendent United States Naval Observatory. Data furnished by Naval Observatory, in cooperation with Harvard, 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	
1933	*h*	*m*	°	°	°			
June 1 (Perkins Observatory)	11	40	No spots			------	------	------
June 2 (Naval Observatory)	11	10	−71.0	150.7	−7.0	6	------	6
June 3 (Naval Observatory	10	28	−57.0	151.9	−7.0	6	------	6
June 4 (Naval Observatory)	14	7	−42.0	151.7	−7.0	6	------	6
June 5 (Naval Observatory)	13	24	−30.0	150.8	−7.0	6	------	6
June 6 (Naval Observatory)	10	32	−17.0	152.2	−7.0	3	------	3
June 7 (Naval Observatory)	10	41	No spots			------	------	------
June 8 (Naval Observatory)	11	2	No spots			------	------	------

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	
1933	*h*	*m*	°	°	°			
June 9 (Naval Observatory)	10	26	No spots			------	------	------
June 10 (Mount Wilson)	9	5	No spots			------	------	------
June 11 (Naval Observatory)	11	50	No spots			------	------	------
June 12 (Naval Observatory)	14	38	−55.0	32.5	+4.0	------	37	37
June 13 (Naval Observatory)	11	2	−43.0	33.2	+4.0	------	77	77
June 14 (Mount Wilson)	8	20	−29.0	35.4	+4.0	------	92	92
June 15 (Naval Observatory)	11	8	−14.0	35.7	+4.0	------	129	129
June 16 (Mount Wilson)	9	30	−1.0	36.4	+5.5	------	112	112
June 17 (Naval Observatory)	10	32	+13.0	36.6	+5.0	56	------	56
June 18 (Naval Observatory)	12	38	+27.0	36.2	+5.0	43	------	43
June 19 (Naval Observatory)	11	9	+40.0	36.7	+5.0	46	------	46
June 20 (Naval Observatory)	11	7	+53.0	36.5	+6.0	46	------	46
June 21 (Naval Observatory)	13	10	+67.0	36.2	+6.0	53	------	53
June 22 (Naval Observatory)	13	58	+81.0	36.5	+6.0	53	------	53
June 23 (Naval Observatory)	11	50	No spots			------	------	------
June 24 (Naval Observatory)	10	33	No spots			------	------	------
June 25 (Mount Wilson)	10	0	No spots			------	------	------
June 26 (Perkins Observatory)	15	0	No spots			------	------	------
June 27 (Naval Observatory)	14	20	No spots			------	------	------
June 28 (Naval Observatory)	10	44	No spots			------	------	------
June 29 (Perkins Observatory)	14	15	No spots			------	------	------
June 30 (Perkins Observatory)	12	45	No spots			------	------	------
Mean daily area for June	------		------	------	------	------	------	26

The Perkins Observatory report for May, received too late for inclusion in the last issue, indicates that there were no spots on May 4, 8, 10, 11, 25, and 30. The mean daily area for May should therefore be changed to 12.

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR JUNE 1933

(Dependent alone on observations at Zurich and its station at Arosa)

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

June 1933	Relative numbers	June 1933	Relative numbers	June 1933	Relative numbers
1	0	11	0	21	8
2	7	12	0	22	------
3	7	13	*Ec* 12	23	0
4	7	14	16	24	0
5	7	15	19	25	0
6	14	16	14	26	0
7	0	17	10	27	0
8	0	18	8	28	0
9	0	19	8	29	0
10	0	20	8	30	0

Mean: 29 days=5.0.

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 zone.

AEROLOGICAL OBSERVATIONS

[Aerological Division, W. R. Gregg, in charge]

By L. T. SAMUELS

Free-air temperatures during June were mostly above normal with the largest departures occurring at Chicago and Omaha. (See table 1.) Free-air relative humidities averaged below normal at practically all stations and levels.

At 1,000 meters above sea level the resultant wind directions over the country east of the Rockies were in general close to normal and the resultant velocities above normal over the northern stations and below normal over the southern stations. (See table 2.) At 4,000 meters the resultant winds were more southerly than normal at several far western and southern stations. Resultant velocities were mostly above normal over the northern sections of the country and below normal over the South.