

TABLE 3.—Solar radiation measurements, and determinations of atmospheric turbidity factor,  $\beta$ , Washington, D.C., December 1933

[Values in italics have been interpolated]

Date and solar hour angle	Solar altitude, h.	Air mass, m.	$I_m$	$I_y$	$I_r$	$\beta$	Blue-ness of sky	Note: Sky-light polarization, P., clouds, etc.
<i>Dec. 1</i>								
2:31a	19-40	2.95	<i>gr. cal</i> 1.041	<i>gr. cal</i> 0.803	<i>gr. cal</i> 0.667	0.080	5	
2:25a	20-25	2.85	1.096	.806	.669	.065		
0:29a	28-53	2.06	1.198	.881	.725	.088		
0:24a	29-01	2.06	1.181	.885	.727	.095		P=56.6
<i>Dec. 7</i>								
2:46a	18-08	3.19	1.116	.857	.716	.120	6	
2:39a	18-56	3.06	1.158	.858	.790	.105		P=60.4

TABLE 4.—Solar radiation measurements obtained at Blue Hill Meteorological Observatory of Harvard University during December 1933

$I_m$ —intensity in the whole spectrum;  $I_y$ —intensity transmitted by yellow glass screen OG;  $I_r$ —intensity transmitted by red glass screen RG.]

Date and solar hour angle	Solar altitude, h.	Air mass, m.	$I_m$	$I_y$	$I_r$	Sky conditions. (Clouds, haze (hz), visibility (v), wind, etc.). International symbols are employed for wind direction and velocity, and kind of clouds.
<i>Dec. 2</i>						
3:29, p.m.	9 44	5.75	<i>gr. cal</i> 0.720	<i>gr. cal</i> 0.580	<i>gr. cal</i> 0.490	2 Ci; hz; v 8; WNW-3.
<i>Dec. 7</i>						
0:58, a.m.	23 55	2.46	1.224	.909	.747	1 Acu, few Frcu; dns hz; v 7; NW-7.
0:42, p.m.	24 26	2.41	1.210	.873	.706	2 Ci, 1 Cu; solar corona; v 7; NW 7-8.
<i>Dec. 14</i>						
1:30, p.m.	21 20	2.74	1.026	.770	.621	No clouds; v 6; NNE-1.
2:44, p.m.	14 26	3.97	.842	.634	.522	
<i>Dec. 16</i>						
1:14, p.m.	22 16	2.62	1.135	.854	.676	1 Ci; v 6; WSW-3.
2:31, p.m.	15 46	3.63	.908	.692	.558	1 Ci; v 6; W-3.
<i>Dec. 28</i>						
2:40, p.m.	14 47	3.86	1.004	.793	.664	Few Frcu; lt hz; v 8; WSW-5.

POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, Superintendent U.S. 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							
Dec. 1 (Naval Observatory)	h. m. 12 15	°	°	°			
Dec. 2 (Naval Observatory)	12 16		No spots				
Dec. 4 (Naval Observatory)	13 10		No spots				
Dec. 5 (Mount Wilson)			No spots				
Dec. 6 (Mount Wilson)			No spots				
Dec. 7 (Naval Observatory)	12 29		No spots				
Dec. 8 (Naval Observatory)	11 9		No spots				
Dec. 9 (Mount Wilson)			No spots				
Dec. 10 (Naval Observatory)	11 46		No spots				
Dec. 11 (Naval Observatory)	11 27	-19.0	186.7	+2.0		28	28
Dec. 12 (Harvard Observatory)			No spots				
Dec. 13 (Harvard Observatory)			No spots				
Dec. 14 (Naval Observatory)	13 20		No spots				
Dec. 15 (Mount Wilson)			No spots				
Dec. 16 (Mount Wilson)			No spots				
Dec. 17 (Mount Wilson)			No spots				
Dec. 18 (Naval Observatory)	13 3		No spots				
Dec. 19 (Mount Wilson)			No spots				
Dec. 20 (Mount Wilson)			No spots				
Dec. 21 (Naval Observatory)	11 46		No spots				
Dec. 22 (Naval Observatory)	10 40		No spots				
Dec. 23 (Naval Observatory)	10 52		No spots				
Dec. 24 (Naval Observatory)	13 20		No spots				
Dec. 25 (Naval Observatory)	11 10		No spots				
Dec. 26 (Mount Wilson)			No spots				
Dec. 27 (Naval Observatory)	10 29		No spots				
Dec. 28 (Naval Observatory)	14 39		No spots				
Dec. 29 (Naval Observatory)	15 3		No spots				
Mean daily area for December							1

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR DECEMBER 1933

[Dependent alone on observations at Zurich and its station at Arosa]

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

December 1933	Relative numbers	December 1933	Relative numbers	December 1933	Relative numbers
1	0	11	Mc 9	21	0
2	0	12	0	22	0
3	0	13	0	23	0
4	0	14	0	24	0
5	0	15		25	0
6	0	16	0	26	0
7	0	17	0	27	0
8	0	18	0	28	0
9	0	19	0	29	0
10	0	20	0	30	0
				31	0

Mean: 30 days = 0.3.

c=New formation of a center of activity; M, in the central zone.