SOLAR OBSERVATIONS

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SOLAR RADIATION MEASUREMENTS MADE DURING OCTOBER 1934

For a description of instruments employed and their exposures, the reader is referred to the January 1932 REVIEW, page 26.

Table 1 shows that solar radiation intensities averaged below normal for October at Lincoln, close to normal at Madison, and considerably above at Washington.

Table 2 shows an excess in the total solar and sky radiation received on a horizontal surface at all stations except Twin Falls, Miami and New Orleans.

Polarization observations obtained at Washington on 6 days give a mean of 54 percent, with a maximum of 60 percent on the first. At Madison, observations made on 11 days give a mean of 52 percent, with a maximum of 57 percent on the 25th. All the above values are below the October normals. Madison reported considerable haze, dust, and smoke.

TABLE 1.—*Solar radiation intensities during October 1934*

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.	Air mass									Local mean solar time
		A. M.					P. M.				
	e	5.0	4.0	3.0	2.0	1.0 [1]	2.0	3.0	4.0	5.0	e
	mm	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm*
Oct. 1	7.04		0.93	1.04	1.29	1.62	1.35	1.16	1.01	0.94	6.50
Oct. 2	7.04	0.86	.94	1.03	1.19	1.54	1.19	1.00	.83	.71	6.50
Oct. 8	8.18		1.00	1.11	1.29	1.52	1.06	.92	.86	.72	6.50
Oct. 9	9.47					1.36					10.21
Oct. 11	10.59				1.10	1.38	1.06	.94	.78	.68	11.38
Oct. 12	7.29	.82	.94	1.03	1.17						6.27
Oct. 13	3.63		1.07	1.20	1.37	1.55					3.81
Oct. 20	4.75	.85	1.01	1.16	1.30	1.52					4.37
Means		.84	.98	1.10	1.24	1.49	1.22	1.00	.84	.76	
Departures		+.09	+.13	+.14	+.11	+.07	+.09	+.06	+.03	+.04	

MADISON, WIS.

Oct. 1	5.79		0.93	1.09							7.32
Oct. 2	8.48		.80	.92	1.21	1.50	1.23				7.87
Oct. 6	5.56		.70	.84	1.08						6.27
Oct. 10	7.57	0.44	.54	.71	.87	1.02	1.03				9.14
Oct. 11	9.14	.85	.96	1.08	1.23	1.50	1.26				8.48
Oct. 12	8.48	.96	1.05	1.17	1.27	1.60	1.20				7.04
Oct. 13	7.39	.75	.86	1.03							7.87
Oct. 15	6.76	.55	.68	.81	1.07	1.40					8.81
Oct. 22	7.57			1.21	1.34	1.58	1.30				7.87
Oct. 23	8.18						.96				9.14
Oct. 25	7.32	.88	1.03	1.18	1.34		1.34				5.36
Oct. 26	6.27	.82	1.01	1.19	1.25		1.27				6.76
Oct. 29	3.45	.96	1.09	1.26			1.34				3.45
Oct. 31	3.99		.82	.88	1.36						3.81
Means		.78	.87	1.03	1.20	1.43	1.21				
Departures		±.00	−.04	−.01	+.01	+.01	+.01				

[1] Extrapolated.

TABLE 1.—*Solar radiation intensities during October 1934*—Contd.

LINCOLN, NEBR.

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.	Air mass									Local mean solar time
		A. M.					P. M.				
	e	5.0	4.0	3.0	2.0	1.0 [1]	2.0	3.0	4.0	5.0	e
	mm	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm*
Oct. 1	8.18	0.81	0.93	1.06	1.26	1.38					7.29
Oct. 2	7.04	.64	.76	.88	1.03	1.42	0.95	0.64	0.46	0.30	7.04
Oct. 5	10.21						1.13	.90	.72	.59	10.59
Oct. 6	4.95	.54	.76	1.00	1.14	1.49					3.81
Oct. 8	7.57		.86	1.06	1.23	1.50	1.16	.87	.67	.56	7.57
Oct. 9	7.29	.63	.74	.88	1.10	1.29					9.14
Oct. 10	7.87	.52	.63	.84	1.02	1.32	1.04	.78	.65	.54	9.83
Oct. 11	7.57	.63	.75	.88	1.10	1.49	1.12	.88	.76	.61	9.14
Oct. 12	7.57	.69	.80	.97	1.15						7.57
Oct. 16	12.24	.78	.85	1.16	1.32						7.04
Oct. 20	8.18		1.04	1.18							8.81
Oct. 22	7.57	.86	.96	1.07	1.33		1.33	1.16	.98	.88	9.83
Oct. 23	11.38	.73	.85	1.00	1.20						14.10
Oct. 25	4.75	.99					1.33	1.17	1.02	.88	4.75
Oct. 26	7.29	.83	.97	1.15	1.30		1.31	1.18	1.05	.94	8.48
Oct. 27	3.15	1.00	1.10	1.24	1.41						2.26
Oct. 29	3.15	1.02	1.13	1.22							2.87
Oct. 30	3.00				1.36		1.18				3.99
Oct. 31	3.30						1.32	1.26	1.16	1.01	3.45
Means		.76	.88	1.04	1.21	1.41	1.19	.98	.83	.70	
Departures		−.07	−.05	−.05	−.06	−.06	−.05	−.09	−.11	−.13	

BLUE HILL, MASS.

Oct. 2	5.4			1.10	1.30	1.52	1.25	1.00	0.80	0.69	7.2
Oct. 3	6.3	0.90	0.98	1.09	1.19	1.30	1.19				5.9
Oct. 7	7.4				1.27	1.40	1.22	.98	.79		6.4
Oct. 8	6.5		1.11	1.21	1.33	1.45					5.9
Oct. 9	4.8		1.09	1.22	1.38	1.55	1.36	1.15	.88		3.5
Oct. 10	3.5		1.23	1.32	1.42	1.52	1.34	1.12	.94	.79	3.7
Oct. 12	4.6						1.32				3.4
Oct. 14	3.8			1.28	1.38	1.51	1.31	1.09	.95		3.3
Oct. 16	5.4					1.39	1.15	.88	.65		6.0
Oct. 17	7.1				1.10		.90				7.6
Oct. 20	4.8				1.00			.95			5.8
Oct. 24	6.5						1.28	1.06			6.5
Oct. 25	5.4			1.03	1.25		1.27	1.08	.94		6.2
Oct. 27	5.0		1.11	1.26	1.42		1.43	1.34			3.8
Oct. 28	2.8				1.43						2.2
Oct. 29	3.5				1.38						3.2
Oct. 30	4.0		1.19	1.33	1.32		1.26	.90			2.3

[1] Extrapolated.

TABLE 2.—*Average daily totals of solar radiation (direct + diffuse) received on a horizontal surface*

Week beginning—	Washington	Madison	Lincoln	Chicago	New York	Fresno	Pittsburgh	Fairbanks	Twin Falls	La Jolla	Miami	New Orleans	Riverside	Blue Hill	Mount Washington	Friday Harbor
	Gram calories per square centimeter															
1934	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Oct. 1	344	308	392	329	322	462	249	141	332	406	408	232	386	339	313	-------
Oct. 8	376	324	359	360	351	458	312	71	358	363	394	286	381	322	220	275
Oct. 15	333	161	244	198	219	335	242	45	242	385	336	306	295	220	258	202
Oct. 22	234	231	329	235	149	390	151	49	262	363	387	321	376	202	192	146
	Departures from weekly normals															
Oct. 1	+11	+34	+59	+86	+48	+26	−8	+40	−77	-------	−18	−100	-------	-------	-------	-------
Oct. 8	+65	+78	+51	+150	+81	+51	+84	−5	−18	-------	−4	−46	-------	-------	-------	-------
Oct. 15	+53	−58	−59	+12	+16	−45	+39	−13	−106	-------	−43	−15	-------	-------	-------	-------
Oct. 22	−32	+29	+51	+67	−40	+37	−29	±0	−35	-------	+11	+51	-------	-------	-------	-------
	Accumulated departures on Oct. 29															
	+2,373	−2,954	+7,219	-------	+13,526	+9,464	−1,897	+287	−6,475	-------	−7,462	+6,265	-------	-------	-------	-------

TABLE 3.—*Total, I_m, and screened, I_y, I_r, solar radiation intensity measurements, obtained during October 1934, and determinations of the atmospheric turbidity factor, β, and water-vapor content, w=depth in millimeters, if precipitated. American University, Washington, D. C.*

Date and hour angle	Solar altitude	Air mass	I_m	I_y	I_r	$\beta_{I_{m-r}}$	$\beta_{I_{y-r}}$	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
Oct. 1	° ′	*m*	*gr. cal.*	*gr. cal.*	*gr. cal.*						*mm*	
0:17 a. m.	47 49	1.34	1.516	1.032	0.819	0.052	0.026	0.039	83.2	5.0	2	P_c.
Oct. 2												
4:48 a. m.	12 24	4.61	.913	.710	.597	.046	.050	.048	56.9	9.7	4	P_c.
4:44 a. m.	13 09	4.34	.916	.710	.597	.048	.056	.052	56.5	8.3	3	
4:25 a. m.	15 56	3.61	.949	.769	.618	.065	.035	.050	61.0	12.0	9	
4:20 a. m.	16 51	3.45	.970	.770	.619	.060	.040	.050	62.0	12.0	10	
4:12 a. m.	18 19	3.21	1.002	.787	.638	.066	.042	.054	63.0	11.3	9	
4:08 a. m.	19 02	3.10	1.025	.809	.647	.060	.038	.049	64.7	11.9	11	
4:04 a. m.	19 46	2.98	1.030	.809	.648	.066	.038	.052	64.8	11.7	12	
4:00 a. m.	20 29	2.86	1.061	.809	.661	.058	.054	.056	65.0	10.3	7	
3:56 a. m.	21 12	2.74	1.070	.810	.662	.062	.060	.061	69.3	14.1	30	
3:17 a. m.	28 04	2.12	1.178	.911	.717	.070	.030	.050	72.6	11.9	18	
3:13 a. m.	28 44	2.07	1.198	.912	.718	.060	.032	.046	73.8	12.0	17	
3:09 a. m.	29 12	2.03	1.212	.907	.736	.068	.062	.065	71.8	8.3	4	
3:05 a. m.	30 01	2.00	1.192	.907	.737	.079	.065	.072	70.0	8.6	4	
1:37 a. m.	42 00	1.49	1.332	.987	.784	.068	.020	.044	80.0	11.3	15	
1:32 a. m.	42 33	1.48	1.378	.989	.774	.044	.020	.032	82.0	11.0	14	
0:52 a. m.	45 57	1.39	1.357	1.001	.770	.058	.026	.042	81.5	11.4	18	
0:48 a. m.	46 12	1.39	1.359	1.001	.770	.056	.024	.041	81.5	11.4	18	
0:39 a. m.	46 39	1.38	1.377	.986	.771	.048	.022	.035	82.2	11.1	16	
0:35 a. m.	46 50	1.37	1.366	.992	.776	.066	.022	.044	81.2	10.7	14	
0:31 a. m.	47 00	1.37	1.355	.993	.776	.070	.020	.045	81.0	11.1	14	
Oct. 8												
3:10 a. m.	27 19	2.17	1.264	.933	.726	.035	.015	.025	78.2	13.0	24	P_p.
3:06 a. m.	27 59	2.12	1.272	.934	.727	.032	.018	.025	78.6	13.0	24	
1:47 a. m.	39 54	1.56	1.347	.963	.754	.038	.022	.030	81.6	12.2	20	
1:42 a. m.	40 20	1.54	1.374	.964	.758	.030	.024	.027	82.4	11.6	16	
0:26 a. m.	44 55	1.41	1.397	.986	.765	.034	.040	.037	82.4	10.4	12	
0:21 a. m.	45 01	1.41	1.411	.986	.765	.024	.040	.032	82.8	10.1	10	
Oct. 11												
3:00 a. m.	28 03	2.12	1.052	.795	.619	.078	.046	.062	71.2	17.1	>50	N_{pp}.
2:55 a. m.	28 49	2.07	1.102	.796	.620	.056	.048	.052	77.2	20.4	>50	
0:20 a. m.	43 53	1.44	1.255	.893	.693	.066	.044	.055	78.2	13.5	35	
0:16 a. m.	44 00	1.44	1.258	.893	.693	.066	.046	.056	78.0	13.2	32	
Oct. 12												
4:14 a. m.	15 20	3.74	.980	.752	.620	.046	.050	.048	60.9	10.5	5	P_c.
4:10 a. m.	16 02	3.59	.980	.752	.620	.052	.054	.053	60.4	10.0	4	
3:35 a. m.	22 06	2.64	1.111	.823	.670	.052	.062	.057	67.1	9.8	5	
3:31 a. m.	22 46	2.57	1.120	.824	.671	.049	.065	.057	67.0	9.4	4	
3:11 a. m.	26 00	2.28	1.139	.844	.689	.068	.072	.070	67.4	8.8	4	
3:07 a. m.	26 38	2.23	1.139	.848	.690	.069	.073	.071	67.8	9.2	4	

Atmospheric conditions during turbidity measurements.

Oct. 1. Temperature, 15° C.; wind, NE 10; vis., 50 miles; polarization, 60 percent; blueness of sky, 6.

Oct. 2. Temperature, 14° C.; wind, NE 6; vis., 30 miles; polarization, 59 percent; blueness of sky, 5.

Oct. 8. Temperature, 14° C.; wind, SW 10; vis., 30 miles; polarization, 55 percent; blueness of sky, 4–5.

Oct. 11. Temperature, 17° C.; wind, SW 11; vis., 20 miles; polarization, 50 percent; blueness of sky, 4.

Oct. 12. Temperature, 14° C.; wind, NW 15; vis., 20 miles; polarization, 48 percent; blueness of sky, 4.

BLUE HILL METEOROLOGICAL OBSERVATORY OF HARVARD UNIVERSITY

Date and hour angle [1]	Solar altitude	Air mass	I_m	I_y	I_r	$\beta_{I_{m-r}}$	$\beta_{I_{y-r}}$	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
Oct. 2	° ′	*m*	*gr. cal.*	*gr. cal.*	*gr. cal.*						*mm*	
3:12	26 58	2.20	1.251	0.897	0.732	0.040	0.062	0.051	71.8	7.2	2.5	P_c.
1:16	41 08	1.52	1.382	.951	.757	.036	.051	.044	76.0	4.7	1.2	
0:28	43 41	1.45	1.406	.970	.776	.033	.057	.045	80.4	7.8	4.2	
1:26	40 18	1.54	1.377	.995	5.759	.031	.049	.040	79.4	8.3	4.7	
4:30	14 00	4.08	0.757	.605	.492	.074	.063	.068	54.0	14.9	29.0	
Oct. 3												
2:56	29 04	2.06	1.181	.841	.680	.052	.073	.062	71.0	10.1	7.5	N_{Tp}.
2:40	31 21	1.92	1.196	.846	.685	.057	.082	.070	71.0	9.3	3.9	
1:17	40 41	1.53	1.193	.840	.692	.095	.146	.120	68.8	7.3	3.1	
Oct. 7												
3:25	24 06	2.44	1.121	.833	.672	.057	.058	058	68.4	6.5	1.4	N_{pp}.
Oct. 8												
3:59	17 40	3.26	1.175	.856	.695	.019	.035	.027	70.7	5.0	0.6	N_{pp}.
2:02	34 42	1.75	1.346	.938	.744	.026	.037	.032	80.2	10.9	5.8	
1:55	35 13	1.73	1.244	.876	.707	.056	.081	.068	73.3	8.2	4.0	
Oct. 9												
3:57	17 42	3.26	1.237	.917	.752	.021	.030	.026	70.9	7.2	1.4	P_c; P_p.
1:58	34 25	1.77	1.433	1.025	.823	.027	.029	.028	80.9	7.2	2.5	
0:47	40 26	1.54	1.459	1.029	.826	.027	.036	.032	81.6	6.5	2.2	
0:18	41 31	1.51	1.467	1.036	.835	.032	.044	.038	81.1	5.6	1.5	
2:33	35 00	1.74	1.350	.971	.787	.048	.057	.052	76.7	7.3	2.6	
Oct. 10												
3:45	19 21	3.00	1.298	.949	.771	.012	.024	.018	75.0	8.3	2.4	P_c; P_p.
1:50	34 22	1.77	1.447	1.023	.828	.024	.043	.034	81.0	6.6	2.1	
0:46	40 08	1.55	1.439	1.019	.826	.037	.057	.047	79.1	5.1	1.2	
3:18	23 37	2.51	1.224	.909	.757	.067	.068	.068	65.5	2.6	0.7	
4:25	12 41	4.47	.865	.702	.596	.070	.065	.068	52.5	8.1	1.4	------
Oct. 14												
1:08	37 22	1.64	1.435	1.008	.823	.034	.062	.048	78.6	5.0	1.1	P_c.
0:43	38 46	1.59	1.433	1.022	.823	.038	.043	.040	80.0	6.5	2.0	
Oct. 16												
1:21	35 44	1.71	1.220	.889	.716	.079	.076	.078	71.6	9.1	6.0	P_c.
2:39	27 23	2.17	1.123	.830	.672	.072	.074	.073	68.0	10.5	8.5	
Oct. 17												
3:08	23 10	2.53	1.123	.842	.682	.054	.056	.055	67.1	9.6	5.0	N_{pc}.
2:30	28.09	2.12	.864	.659	.554	.162	.179	.170	51.6	7.4	2.2	
Oct. 20												
3:37	17 46	3.24	.914	.724	.601	.084	.079	.082	56.3	9.6	3.9	P_c.
Oct. 24												
0:01	36 06	1.69	1.121	.853	.690	.072	.100	.086	69.6	7.9	3.6	N_{pc}.
1:31	37 32	1.86	1.314	.941	.737	.059	.024	.042	77.3	10.3	9.2	
1:54	30 06	1.99	1.272	.928	.747	.052	.051	.052	73.6	8.8	4.8	
3:37	16 44	3.45	.947	.739	.604	.065	.058	.062	58.9	10.6	5.5	
3:45	15 29	3.49	.918	.722	.599	.074	.071	.072	56.7	9.8	4.0	

[1] p. m. hour angles in italics.

BLUE HILL METEOROLOGICAL OBSERVATORY OF HARVARD UNIVERSITY—Continued

Date and hour angle	Solar altitude	Air mass	I_m	I_y	I_r	β_{I_m-r}	β_{I_y-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
Oct. 25	° ′	*m*	*gr. cal.*	*gr. cal.*	*gr. cal.*						*mm*	
1:24	32 29	1.86	1.269	0.903	0.738	0.057	0.085	0.071	71.5	6.8	2.1	N_{FC} or P_A
0:43	34 51	1.75	1.320	.944	.756	.058	.025	.042	77.0	9.7	3.4	------
3:34	16 55	3.41	.996	.776	.632	.058	.049	.054	57.6	6.8	1.2	P_C.
Oct. 27												
1:28	31 54	1.89	1.446	1.032	.828	.049	.025	.037	77.9	4.3	0.6	
0:06	35 03	1.74	1.438	1.018	.816	.025	.049	.037	79.2	6.0	1.5	
Oct. 29												
1:39	30 05	1.99	1.364	.978	.792	.036	.046	.041	76.2	6.9	2.0	P_C.
Oct. 30												
3:38	14 32	3.94	1.214	.921	.752	.014	.018	.016	68.9	7.2	1.2	P_C.
1:08	31 22	1.92	1.314	.951	.763	.042	.046	.044	75.1	8.3	3.8	
0:57	32 33	1.86	1.308	.943	.765	.053	.065	.059	73.7	7.2	2.4	

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	Clouds and remarks
October 1934	°C				
2, 3:46 a. m.	5.66	NNE 4	5–8	8	2 Acu.
2, 1:36 a. m.	11.1	ExN 3	9	6	1 Ast, 1 Cu. Smk. in W-N.
2, 1:18 p. m.	12.2	ExN 2	9	6	2 Ci, few Frcu.
2, 4:27 p. m.	12.2	E 2	9	7	1 Ci, lt. hz.
3, 2:43 a. m.	12.6	N 2	8	8	Few Ci.
3, 1:29 a. m.	15.1	NW 2	8	8	1 Ci.
7, 2:17 a. m.	14.4	WxN 7	------	6	7 Frcu.
7, 1:18 p. m.	15.6	WxN 7	------	4	7 Cu.
7, 3:46 p. m.	15.0	WNW 7	------	4	3 Cu.
8, 4:04 a. m.	9.0	W 6	8	12	0 clouds.
8, 2:08 a. m.	13.9	WxS 6	9	7	Few Acu.
8, 2:04 p. m.	19.2	WxS 6	9	------	0 clouds.
8, 4:44 p. m.	20.0	W 5	9	------	Few Cu, lt. hz.
9, 3:50 a. m.	9.4	NW 3	8	12	Few Ci.
9, 1:58 a. m.	13.9	WNW 5	9	7	4 Ci.
9, 0:20 p. m.	13.3	WNW 4	9	8	2 Ci.
9, 3:25 p. m.	13.6	W 2	9	------	Few Ci, few Acu.
10, 3:49 a. m.	4.3	NW 6	8	12	2 Ci.
10, 1:52 a. m.	7.2	NW 3	9	6	5 Ci.
10, 0:46 p. m.	10.9	SWxS 2	9	------	2 Ci.
10, 4:18 p. m.	13.6	WSW 2	9	8	1 Ci, few Acu.
14, 3:24 a. m.	4.3	NW 9	9	11	Few Acu, few Cu.
14, 1:08 a. m.	7.8	NN 5	9	8	Few Cu.
14, 0:40 p. m.	8.3	NW 5	9	------	Few Ci, 1 Cu.
14, 3:51 p. m.	10.0	WNW 4	10	------	1 Ci in E; few Cu.
16, 0:27 p. m.	9.4	NE 1	8	8	2 Cu.
16, 2:40 p. m.	9.9	NNE 2	------	------	Few Ci in S.
16, 4:18 p. m.	9.4	ENE 3	------	7	0 clouds; smk. on hor'n.
17, 3:12 a. m.	10.0	SW 3	8	8	Clear.
17, 1:32 a. m.	13.3	SSW 2	+8	------	4 Ci. (dense); mod. hz.
17, 2:40 p. m.	16.7	SSW 3	8	6	0 clouds; mod. to dns. hz.
17, 4:04 p. m.	15.0	SWxS 4	8	6	0 clouds, mod. hz.
20, 2:25 a. m.	6.7	WNW 4	8	6	Few Ci, 1 Cu.
20, 3:36 p. m.	11.7	WNW 4	8	9	1 Ci.
24, 12 noon	9.4	NExE 4	9	6	1 Cu & Frcu fumules.
24, 1:32 p. m.	10.6	NExE 4	9	7–8	1 Stcu, hy. smk. N & NW.
24, 3:40 p. m.	11.7	NExN 4	9	7	Few Acu, lt. hz., smk.
25, 3:07 a. m.	9.4	N 3	7	10	Few Acu in west.
25, 1:30 a. m.	10.0	N 3	------	10	1 Ci in W.
25, 0:42 p. m.	12.0	NNE 3	------	8	1 Ci in W.
25, 3:33 p. m.	10.5	NNE 2	------	8	Few Ci in W.
27, 3:21 a. m.	4.5	WNW 5	+9	------	Few Frcu, few Acu.
27, 2:24 a. m.	5.0	WNW 5	------	6	Few Frcu, few Acu.
27, 1:29 a. m.	6.1	WNW 7	9	8	1 Ast, few Frcu, lt. smk.
27, 1:07 p. m.	7.2	NWxW 6	9	------	Few Ci, 1 Acu, few Frcu.
29, 1:41 a. m.	6.1	SW 3	9	7	1 Ci, few Acu, few Cu.
30, 3:40 a. m.	1.1	WSW 4	8	9	1 Ci, few Acu.
30, 1:09 a. m.	6.7	WSW 4	9	------	Few Cu.
30, 0:56 p. m.	13.4	W 5	------	7	1 Cu.

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
1934	*h*	*m*							
Oct. 1	11	21		No spots		------	------	------	U. S. Naval.
Oct. 2	11	29		No spots		------	------	------	Do.
Oct. 3	11	11		No spots		------	------	------	Do.
Oct. 4	9	35		No spots		------	------	------	Mt. Wilson.
Oct. 5	9	20		No spots		------	------	------	Do.
Oct. 7	12	22		No spots		------	------	------	U. S. Naval.
Oct. 8	11	10		No spots		------	------	------	Do.
Oct. 9	11	38		No spots		------	------	------	Do.
Oct. 10	11	0		No spots		------	------	------	Mt. Wilson.
Oct. 11	11	25		No spots		------	------	------	U. S. Naval.
Oct. 12	11	56	−64.0	74.9	−22.0	46	------	46	Do.
Oct. 13	11	6	−51.0	75.1	−22.5	39	------	39	Do.
Oct. 14	11	36	−37.5	75.2	−22.5	27	------	27	Do.
Oct. 15	11	44	−24.5	74.9	−22.5	27	------	27	Do.
Oct. 16	11	10	−12.0	74.5	−22.0	15	------	15	Do.
Oct. 17	14	14	+4.0	75.6	−22.0	15	------	15	Do.
Oct. 18	11	8	+16.0	76.1	−22.0	15	------	15	Do.
Oct. 19	11	32		No spots		------	------	------	Do.
Oct. 20	11	14		No spots		------	------	------	Do.
Oct. 21	11	10		No spots		------	------	------	Mt. Wilson.
Oct. 22	11	53	−22.5	344.5	+24.0	39	------	39	U. S. Naval.
Oct. 23	13	14	−8.5	344.6	+23.0	15	------	15	Do.
Oct. 24	9	30		No spots		------	------	------	Mt. Wilson.
Oct. 25	11	58	−80.0	247.4	+4.5	31	------	31	U. S. Naval.
Oct. 26	11	22	−65.5	249.0	+4.5	46	------	46	Do.
Oct. 27	12	0	−51.0	250.0	+5.0	27	------	27	Mt. Wilson.
Oct. 28	11	53	−39.0	248.9	+4.5	31	------	31	U. S. Naval.
Oct. 29	13	56	−24.5	249.0	+4.5	31	------	31	Do.
Oct. 30	11	17	−11.5	250.3	+4.5	15	------	15	Do.
Oct. 31	13	15	−80.0	167.5	+23.0	------	123	123	Do.

Mean daily area for 30 days, 18.

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR OCTOBER 1934

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

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

October 1934	Relative numbers	October 1934	Relative numbers	October 1934	Relative numbers
1	15	11	7	21	0
2	0	12	8	22	7
3	0	13	8	23	8
4	8?	14	8	24	0
5	0	15	------	25	7
6	0	16	------	26	7
7	0	17	8	27	7
8	0	18	8	28	7
9	0	19	14	29	10
10	0	20	0	30	16
				31	8

Mean, 29 days=5.6.