BIBLIOGRAPHY

[RICHMOND T. ZOCH, *in Charge of Library*]

By AMY D. PUTNAM

RECENT ADDITIONS

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

Azeredo Penna, Lenoam de.
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Apparate und Methoden zur Messung der Gesamtstrahlung der Himmelskörper. Berlin. 1936. 16 p. tables. 25 cm. (Sonderabdruck aus dem Handbuch der Astrophysik, von G. Eberhard u. a. Band VII.)

Bjerknes, J., & Godske, C. L.
On the theory of cyclone formation at extra-tropical fronts. Oslo. 1936. p. 199–235. figs. 24 cm. (Astrophysica norvegica. v. 1, no. 6. Februar 1936.)

Cline, Isaac Monroe.
A century of progress in the study of cyclones; aids in forecasting movements and destructive agencies in tropical cyclones. New Orleans. 1935. 29 p. diagrs. 23 cm. Bibliography: p. 24–29.

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Hoffstedt, Hans.
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Lindsay, Martin.
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A view of the structure of the "Muroto typhoon." Kyoto. 1936. p. 79–91. illus., diagr. 25½ cm. (Reprint: Memoirs of the College of science, Kyoto imperial univ. Ser. A. v. XIX, no. 2, 1936.)

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SOLAR OBSERVATIONS

SOLAR RADIATION OBSERVATIONS DURING JULY 1936

By IRVING F. HAND, *Assistant in Solar Radiation Investigations*

For a description of instruments employed and their exposures, the reader is referred to the January 1935, REVIEW, page 24.

Table 1 shows that solar radiation intensities averaged above normal for July at both Washington and Lincoln, and below normal at Madison. A great deal of haze was noted during most of the observational periods at Madison.

Table 2 shows an excess in the total solar and sky radiation received on a horizontal surface at all stations except Miami, Blue Hill, Riverside, and Friday Harbor—all coastal stations. The excess at some stations was greater than for any previous month.

Table 3 shows high turbidity values at both Washington and Blue Hill, with moderate water-vapor content of the atmosphere considering the season of the year.

Polarization observations taken at Washington on 5 days give a mean of 56 percent with a maximum of 58 percent on the 7th. At Madison, observations made on 12 days give a mean of 50 percent with a maximum of 59 percent on the 7th. The values for Washington are slightly below the July normals, while those for Madison are considerably below the normals for the month.

TABLE 1.—*Solar radiation intensities during July 1936*

[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*
July 7	14.60	------	------	------	1.16	1.46	------	------	------	------	10.21
July 8	14.10	------	------	------	1.10	1.35	------	------	------	------	16.20
July 9	17.37	------	------	------	1.04	1.27	------	------	------	------	17.37
July 10	17.96	------	------	------	.84	1.24	------	------	------	------	16.79
July 15	16.79	------	------	0.71	.89	1.18	------	------	------	------	16.79
July 17	15.11	------	------	.72	.81	1.14	------	------	------	------	13.13
July 23	17.37	------	------	.84	.99	1.23	------	------	------	------	14.10
July 25	10.97	------	------	.55	.81	1.23	------	------	------	------	9.14
Means	------	------	------	.70	.96	1.26	------	------	------	------	------
Departures	------	------	------	−.08	+.04	+.05	------	------	------	------	------

[1] Extrapolated.

TABLE 1.—*Solar radiation intensities during July 1936*—Con.

[Gram-calories per minute per square centimeter of normal surface]

MADISON, WIS.

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	1.0	2.0	3.0	4.0	5.0	e
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm*
July 2	11.81	------	0.84	------	------	------	------	------	------	------	11.38
July 6	11.38	------	.62	0.79	0.96	1.29	------	------	------	------	15.65
July 7	16.79	------	.78	.96	1.11	1.40	------	------	------	------	17.37
July 8	16.20	------	.80	.95	1.12	1.36	------	------	------	------	15.65
July 9	15.11	0.60	.71	.86	.98	------	------	------	------	------	16.20
July 10	16.20	------	.74	.90	1.04	1.29	------	------	------	------	17.37
July 13	20.57	.49	.59	.73	.90	1.18	------	------	------	------	18.59
July 14	19.89	------	.52	------	------	------	------	------	------	------	17.37
July 16	12.68	------	.50	.60	.76	1.12	------	------	------	------	14.10
July 18	16.20	------	------	------	------	1.25	------	------	------	------	18.59
July 21	11.38	------	------	------	------	1.38	------	------	------	------	7.57
July 23	14.10	------	------	------	.95	------	------	------	------	------	15.11
July 27	12.68	------	.54	------	------	------	------	------	------	------	16.79
July 28	14.60	.57	.66	------	.98	------	------	------	------	------	11.81
July 29	11.81	.66	.84	------	1.22	------	------	------	------	------	9.87
July 31	9.45	.54	.70	------	1.04	------	------	------	------	------	10.59
Means	------	.57	.68	.83	1.01	1.28	------	------	------	------	------
Departures	------	−.10	−.10	−.09	−.06	−.03	------	------	------	------	------

LINCOLN, NEBR.

July 1	------	------	------	------	------	1.44	1.24	1.06	0.92	0.82	7.38
July 2	------	------	0.94	1.08	1.22	1.45	1.16	.98	.85	.72	6.76
July 6	13.13	0.72	.84	.98	1.20	1.43	------	------	------	------	12.24
July 7	9.47	.75	.85	.98	1.15	1.39	------	------	------	------	11.81
July 9	15.11	.80	.89	1.04	1.22	1.40	------	------	------	------	11.81
July 10	14.60	.72	.82	1.00	1.18	1.42	------	------	------	------	11.81
July 11	14.10	------	.86	1.01	1.17	1.39	------	------	------	------	10.59
July 12	13.13	------	------	------	1.10	1.35	------	------	------	------	13.13
July 15	10.97	.91	1.02	1.16	1.24	1.45	1.18	1.00	.85	.71	9.47
July 16	14.10	.64	.71	.84	1.05	1.39	------	------	------	------	11.38

TABLE 1.—*Solar radiation intensities during July 1936*—Con.

[Gram-calories per minute per square centimeter of normal surface]

LINCOLN, NEBR.—Continued

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	1.0	2.0	3.0	4.0	5.0	e
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm*
July 17	9.14	------	------	0.84	1.02	1.30	------	------	------	------	10.21
July 23	10.21	0.67	0.79	1.01	1.18	1.46	------	------	------	------	8.18
July 24	11.38	------	------	.88	1.06	1.33	------	------	------	------	9.14
July 31	12.24	.80	.90	1.03	1.17	1.34	------	------	------	------	6.27
Means	9.14	.75	.87	.99	1.15	1.40	1.18	1.00	0.85	0.71	------
Departures	6.27	+.04	+.08	+.07	+.07	+.06	+.11	+.11	+.09	+.01	------

BLUE HILL OBSERVATORY OF HARVARD UNIVERSITY

July 1	6.8	------	0.99	1.10	1.22	1.44	1.13	0.91	0.76	0.69	7.1
July 2	11.5	------	------	------	1.11	1.27	.75	------	------	------	10.5
July 4	13.7	------	------	------	------	1.20	.83	------	------	------	11.5
July 6	12.8	------	------	------	------	1.32	1.06	------	------	------	11.9
July 7	13.7	------	.82	1.09	1.29	1.34	------	------	------	------	8.6
July 8	11.5	------	------	------	------	1.17	.83	.55	------	------	12.3
July 9	15.8	------	------	------	------	1.18	------	------	------	------	16.9
July 10	17.5	------	------	------	------	1.23	------	------	------	------	17.5
July 15	11.1	------	------	------	1.16	1.20	------	------	------	------	10.3
July 16	9.6	------	------	------	1.20	1.40	------	------	------	------	9.9
July 17	10.7	------	------	------	1.17	1.21	------	------	------	------	10.7
July 19	12.8	------	------	------	------	1.19	------	------	------	------	12.3
July 22	11.9	------	------	------	------	1.05	.65	------	------	------	13.2
July 23	12.8	------	------	------	.75	.87	------	------	------	------	15.3
July 25	9.9	------	------	------	1.22	------	------	------	------	------	9.2
July 26	8.6	------	------	------	1.16	1.46	------	------	------	------	8.6
July 27	9.6	------	------	------	------	1.35	1.11	------	------	------	9.6
July 28	13.2	------	------	------	1.19	1.23	------	------	------	------	11.5
Means	------	------	.90	1.10	1.15	1.24	.91	.73	.76	.69	------

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	Ithaca	San Juan
	Gram-calories per square centimeter																	
1936	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
July 2	514	597	716	550	570	698	610	408	599	527	496	524	608	588	------	493	582	633
July 9	563	548	713	527	549	681	585	396	555	540	432	454	596	458	------	516	576	592
July 16	500	528	670	518	486	696	597	446	568	631	478	642	488	491	------	720	496	583
July 23	518	553	578	512	414	682	489	393	560	402	495	535	502	514	------	665	493	555
	Departures from weekly normals																	
July 2	+1	+68	+127	+85	+116	−6	------	−38	−4	------	−19	+122	−6	+33	------	−83	+30	------
July 9	+67	+13	+127	+68	+95	−17	------	+103	−46	------	−90	+60	−7	−68	------	−60	+30	------
July 16	+16	+9	+87	+58	−40	+9	------	+186	−38	------	−35	+230	−92	−18	------	+110	−30	------
July 23	+30	+44	+23	+49	−111	+18	------	+55	−11	------	−36	+171	−70	+9	------	+4	+27	------
	Accumulated departures on July 29																	
	+2,989	+3,108	+5,992	+9,765	+5,110	+2,965	------	+2,590	−896	------	−5,782	+14,383	+21	−812	------	−371	+889	------

TABLE 3.—*Total, I_m and screened, I_y, I_r, solar radiation intensity measurements, obtained during July 1936, 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}	$\frac{I_{w-o}}{1.94}$ (Percentage of solar constant)	$\frac{I_{w-o}-I_m}{1.94}$ (Percentage of solar constant)	w	Air-mass type
July 8	° ′	*m*	*gr. cal.*	*gr. cal.*	*gr. cal.*						*mm*	
1:40 a. m.	63 05	1.12	1.296	0.886	0.696	0.088	0.056	0.072	82.2	13.2	35.0	$N_{PC}\rightarrow T_M$
1:36 a. m.	63 45	1.11	1.300	.886	.696	.086	.056	.071	82.3	13.1	34.0	
July 9												
2:52 a. m.	49 55	1.30	1.106	.802	.637	.156	.096	.126	68.9	10.4	14.0	T_M+S
2:44 a. m.	51 26	1.28	1.110	.802	.637	.156	.096	.126	68.9	10.4	14.0	
July 17												
1:08 a. m.	67 02	1.09	1.080	.738	.582	.158	.148	.153	69.1	11.6	31.0	P_C
1:00 a. m.	68 05	1.08	1.083	.739	.582	.157	.147	.152	69.2	11.6	31.5	

Atmospheric conditions during turbidity measurements

July 8. Temperature 19° C., wind, SW 10; visibility, 30 miles; polarization, 55.2 percent.
July 9. Temperature 20° C.; wind, SW 9; visibility, 20 miles; polarization, 53.3 percent.
July 17. Temperature 30° C., wind, S 6; visibility, 20 miles; polarization, 56.0 percent.

BLUE HILL METEOROLOGICAL OBSERVATORY OF HARVARD UNIVERSITY

Date and hour angle	Solar altitude	Air mass	I_m	I_y	I_r	$\beta_{I_{m-r}}$	$\beta_{I_{y-r}}$	β_{mean}	$\frac{I_{w-o}}{1.94}$ (Percentage of solar constant)	$\frac{I_{w-o}-I_m}{1.94}$ (Percentage of solar constant)	w	Air-mass type
July 1												
4:19 a. m.	32 42	1.80	1.253	0.837	0.647	0.036	0.049	0.042	78.6	11.8	8.8	P_e
2:25 a. m.	52 39	1.25	1.375	.860	.691	.037	.037	.037	83.7	10.4	9.1	
2:34 p. m.	52 50	1.25	1.296	.810	.649	.059	.065	.062	79.8	10.7	9.3	
July 2												
2:42 a.m.	51 22	1.28	1.223	.782	.621	.074	.092	.083	75.8	10.6	9.0	$N_{pc}\rightarrow T_N$
1:52 a. m.	60 51	1.14	1.246	.789	.633	.070	.048	.059	80.6	14.3	13.0	
July 4												
3:40 p. m.	40 44	1.53	.951	.654	.527	.171	.161	.166	58.7	8.0	6.4	P_e
5:13 p. m.	23 07	2.54	.700	.500	.423	.160	.180	.170	64.4	16.8	10.7	
July 6												
1:17 p. m.	64 43	1.10	1.279	.823	.666	.081	.123	.102	75.6	6.5	6.0	P_e
3:56 p. m.	37 39	1.63	1.154	.760	.617	.060	.080	.070	73.9	12.4	9.6	
July 7												
5:31 a. m.	16 45	3.45	.960	.622	.537	.044	.052	.048	63.6	2.5	1.9	$N_{pc}\rightarrow T_N$
3:17 a. m.	44 56	1.41	1.270	.806	.650	.063	.092	.078	70.7	3.0	2.3	
1:47 a. m.	60 55	1.14	1.331	.830	.656	.043	.075	.059	81.7	10.8	9.2	
1:39 p. m.	62 10	1.13	1.267	.805	.643	.082	.095	.088	77.8	10.3	9.1	
July 8												
0:23 p. m.	69 41	1.06	1.153	.721	.582	.114	.200	.157	70.7	9.3	8.8	$N_{pc}\rightarrow T_N$
5:52 p. m.	16 15	3.55	.470	.319	.235	.168	.099	.134	41.7	16.6	8.7	
July 9												
0:25 a. m.	69 31	1.06	1.149	.715	.572	.115	.187	.151	72.6	11.6	11.4	T_m+S
July 10												
1:24 p. m.	63 25	1.12	1.226	.755	.620	.191	.200	.196	65.7	.4	.4	N_{pc}, T_m aloft
3:59 p. m.	36 50	1.67	.798	.551	.453	.188	.187	.188	55.5	13.2	10.3	
July 15												
4:40 a. m.	28 49	2.07	1.138	.751	.594	.037	.045	.041	75.4	14.8	13.2	P_e
3:23 p. m.	43 01	1.46	1.184	.766	.623	.059	.081	.070	74.9	11.9	11.0	
July 16												
4:49 a. m.	27 03	2.20	1.116	.745	.578	.038	.031	.034	75.9	16.5	11.0	P_e
2:11 a. m.	55 23	1.21	1.356	.839	.666	.032	.050	.041	84.2	12.0	11.0	
July 17												
4:34 a. m.	29 44	2.01	1.167	.764	.612	.039	.058	.048	74.6	12.5	8.5	P_c
2:36 a. m.	51 34	1.27	1.250	.789	.626	.062	.053	.058	81.0	14.5	12.4	
July 19												
2:21 p. m.	62 00	1.13	1.098	.710	.573	.149	.195	.172	68.5	10.0	8.7	N_{pc}
July 22												
3:03 p. m.	45 47	1.39	.888	.583	.493	(1)	(1)	(1)	----------	----------	----------	N_{pk}
3:34 p. m.	40 13	1.55	.831	.577	.472	.182	.218	.200	57.0	12.4	9.9	
July 23												
3:26 a. m.	41 33	1.51	.815	.562	.468	(1)	(1)	(1)	----------	----------	----------	N_{pe}
2:54 a. m.	48 18	1.36	.840	.581	.474	(1)	(1)	(1)	----------	----------	----------	
July 25												
4:22 a. m.	42 02	1.49	1.234	.782	.633	.079	.081	.080	78.2	12.6	10.1	P_e
4:31 a. m.	46 15	1.38	1.228	.770	.635	.075	.113	.094	72.8	7.5	6.2	
July 26												
3:15 a. m.	43 05	1.46	1.353	.816	.657	.015	.092	.054	78.4	6.5	5.3	P_e
2:58 a. m.	46 11	1.39	1.365	.824	.669	.025	.104	.064	78.4	5.8	4.8	
July 27												
0:43 p. m.	65 15	1.10	1.330	.814	.665	.051	.130	.090	78.1	7.3	6.7	P_e
3:02 p. m.	45 20	1.40	1.245	.772	.615	.045	.099	.072	76.5	9.9	8.2	
4:15 p. m.	32 02	1.88	1.109	.706	.564	.050	.090	.070	70.4	11.2	8.7	
July 28												
3:27 a. m.	40 42	1.53	1.177	.750	.602	.076	.104	.090	73.4	10.9	8.6	N_{pe}
2:58 a. m.	45 15	1.40	1.240	.786	.632	.087	.111	.099	72.5	6.4	5.2	
1:04 p. m.	63 30	1.11	1.222	.770	.624	.095	.175	.135	72.9	7.4	6.8	

[1] On account of film forming on screens during warm and damp weather, all screened readings (I_y & I_r) were found to be 3 percent low, and have therefore been increased by that amount before using them to compute β.

* Turbidity above 0.200 at time these observations were obtained.

Atmospheric conditions during solar radiation measurements, Blue Hill Observatory of Harvard University, July 1936

Date	Time from apparent noon	Air temperature	Wind (Beaufort scale)	Visibility (0-10 scale)	Sky blueness	Cloudiness and remarks
		° C.				
1	2:43 a. m.	+17.8	NW 4	9	7	3 Ci.
2	2:13 a. m.	+23.4	NE 2	8	8	2 Ci, 1 Cicu, mod. haze, wind variable.
2	4:32 p. m.	+21.8	E 2	8	7	5 Ci, 2 Cu, mod. haze, thin ci near sun.
6	2:55 p. m.	+19.6	NE 2	9	8	Few Acu, few Cu.
7	3:35 a. m.	+22.2	W 2	9	8	1 Ci.
7	0:30 a. m.	+26.7	WNW 3	9	8	4 Ci, few Cu.
8	0:28 p. m.	+30.6	W 3	8	7	7 Ci, light haze.
8	0:52 p. m.	+31.1	W 4	8	7	7 Ci, few Acu, few Cu, light haze, Ci near sun.
10	1:40 p. m.	+28.9	W 1	5	5	1 Ci, 1 Cunb, mod. haze.
10	1:57 p. m.	+29.9	WNW 1	5	5	1 Ci, 2 Cunb, mod. haze.
15	4:34 a. m.	+19.2	NW 2	8	7	Few Ci.
16	4:43 a. m.	+17.1	NW 3	9	7	3 Ci, Ci near sun.
16	2:06 a. m.	+20.6	NW 3	9	8	3 Ci, 1 Cu.
17	4:28 a. m.	+17.8	NW 2	7	8	1 Ci, few Acu, light haze.
23	3:13 a. m.	+21.2	SW 4	8	7	Few Ci, few Cu, light haze.
25	4:19 a. m.	+16.9	NW 3	8	7	Few Acu, few Cu.
26	3:11 a. m.	+16.7	W 3	9	8	1 Ci, few Cu.
27	0:25 p. m.	+21.8	W 4	9	6	1 Cu, light haze.
27	3:53 p. m.	+22.8	W 4	9	6	1 Ci, few Cu, light haze.
28	3:17 a. m.	+22.8	SW 3	7	6	1 Ci, mod. haze.

POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, U. S. Navy (Ret.), 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			Area		Total area for each day	Observatory
		Diff. in longitude	Longitude	Latitude	Spot	Group		
1936	h. m.	°	°	°				
July 1	12 5	−65.0	66.5	+32.0		13		Mount Wilson.
		−58.0	73.5	+21.0		26		
		−57.0	74.5	+29.0	18			
		−5.0	126.5	+29.0	4			
		+17.0	148.5	−18.0		2		
		+25.0	156.5	+15.0		12		
		+53.0	184.5	−19.0		177		
		+75.0	206.5	+29.0		195		
		+76.0	207.5	+19.0		563	1,010	
July 2	12 14	−50.0	68.2	+31.0		46		U. S. Naval.
		−44.0	74.2	+21.0		69		
		+37.0	155.2	+14.0		123		
		+39.0	157.2	−19.0		31		
		+60.0	178.2	−20.0		93	362	
July 3	13 30	−29.0	75.3	+20.0		123		Do.
		+52.0	156.3	+14.0		216		
		+75.0	179.3	−20.0	31		370	
July 4	11 1	−18.0	74.4	+20.0		123		Do.
		+35.0	127.4	+29.0		77		
		+65.0	157.4	+13.5		216	416	
July 5	12 18	−4.0	74.5	+19.0		62		Do.
		+10.0	88.5	−16.0		93	155	
July 6	11 43	+8.0	73.5	+18.5		123		Do.
		+23.0	88.5	−16.5		247	370	
July 7	11 4	+36.0	88.7	−16.5		278	278	Do.
July 8	11 5	−79.0	320.4	+21.0		123		Do.
		−36.0	3.4	−27.5		46		
		+49.0	88.4	−16.5		432	601	
July 9	11 20	−65.0	321.0	+21.5		247		Do.
		+45.0	71.0	−28.0		62		
		+63.0	89.0	−16.5		278	587	
July 10	11 6	−61.0	311.9	−14.0		93		Do.
		−52.0	320.9	+21.5		370		
		+74.0	86.9	−16.5		154	617	
July 11	11 7	−83.0	276.7	+20.5	31			Do.
		−47.0	312.7	−14.0		463		
		−38.0	321.7	+21.5		62	556	

POSITIONS AND AREAS OF SUN SPOTS—Continued

Date	Eastern standard time	Heliographic			Area		Total area for each day	Observatory
		Diff. in longitude	Longitude	Latitude	Spot	Group		
	h. m.	°	°	°				
July 12	11 31	−70.0	276.2	+20.0	31			U. S. Naval.
		−37.0	309.2	−16.0	23			
		−29.0	317.2	−16.0	31			
		−25.0	321.2	+21.5		494		
		−22.0	324.2	−17.0		123	702	
July 13	12 45	−55.0	277.3	+20.5	39			Mount Wilson.
		−16.0	316.3	−14.0		12		
		−11.0	321.3	+20.5		384		
		−6.0	326.3	−16.0		43		
		+33.0	5.3	−17.0	3		481	
July 14	11 23	−58.0	261.8	+20.0		31		U. S. Naval.
		−43.0	276.8	+20.0	31			
		+1.0	320.8	+21.0		525		
		+6.0	325.8	−17.0		123	710	
July 15	11 9	−43.0	263.7	+19.5		46		Do.
		−30.0	276.7	+20.0	46			
		+14.0	320.7	+20.0		617		
		+17.0	323.7	−19.0	15			
		+22.5	329.2	−14.0	15		739	
July 16	10 55	−71.0	222.6	−19.0	93			Do.
		−27.0	266.6	+19.5	31			
		−17.0	276.6	+20.0	31			
		+26.5	320.1	+20.0		617	772	
July 17	11 3	−59.0	221.3	−19.0		185		Do.
		−18.0	262.3	+19.5	15			
		−9.0	271.3	+17.0		93		
		−4.0	276.3	+20.0	31			
		+40.0	320.3	+20.0		370	694	
July 18	8 30	−48.0	220.5	−18.0	239			Mount Wilson.
		−5.0	263.5	+20.0		3		
		+3.0	271.5	+15.0	15			
		+7.0	275.5	+20.0	9			
		+14.0	282.5	+23.0	8			
		+47.0	315.5	−25.0		10		
		+54.0	322.5	+20.0		298	582	
July 19	11 6	−33.0	220.8	−19.0		185		U. S. Naval.
		+60.0	313.8	+23.0	15			
		+71.0	324.8	+19.0		170	370	
July 20	13 5	−78.0	161.6	+12.0	79			Mount Wilson.
		−18.0	221.6	−18.0		171		
		+22.0	261.6	+20.0		12		
		+88.0	327.6	+19.0	114		376	
July 21	11 38	−66.0	161.1	+11.0	31			U. S. Naval.
		−6.0	221.1	−19.0		185	216	
July 22	11 37	−52.0	161.9	+11.0	46			Do.
		+7.5	221.4	−18.5		154	200	
July 23	11 10	−40.0	160.9	+11.0	46			Do.
		+8.0	208.9	+23.0		31		
		+20.0	220.9	−18.5		123	200	
July 24	15 10	−24.0	161.5	+11.0	62			Do.
		+23.0	208.5	+24.0		93		
		+33.0	218.5	+24.0	15			
		+35.0	220.5	−17.5		123	293	
July 25	11 6	−13.0	161.5	+11.0	46			Do.
		+35.0	209.5	+22.5		154		
		+48.0	222.5	−18.0	123		323	
July 27	13 34	+14.5	161.2	+11.0	31			Do.
		+62.0	208.7	+21.0		123	154	
July 28	13 12	−68.0	65.6	−28.0		278		Do.
		+27.0	160.6	+11.0	15			
		+76.0	209.6	+21.5		93	386	
July 29	11 32	−55.0	66.3	−27.0		309		Do.
		−27.0	94.3	+26.5		154	463	
July 30	12 0	−49.0	58.8	−25.0		48		Mount Wilson.
		−40.0	67.8	−22.0		68		
		−40.0	67.8	−26.0		316		
		−13.0	94.8	+26.0		259		
		+6.0	113.8	−26.0		7		
		+20.0	127.8	−21.0	4			
		+30.0	137.8	−10.0	2			
		+64.0	171.8	+28.0		42	745	
July 31	13 58	−35.0	58.5	−26.0		154		U. S. Naval.
		−28.0	65.5	−26.0	216			
		−26.0	67.5	−19.0		123		
		0.0	93.5	+26.0		370		
		+43.0	136.5	−10.0	46			
		+78.0	171.5	+28.0		62	971	

Mean daily area for 30 days, 490

PROVISIONAL SUN-SPOT RELATIVE NUMBERS, JULY 1936

(NOTE.—The above report not received in time for inclusion in this issue.—ED.)