TABLE 1.—*Solar radiation intensities during October, 1931*

[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.*
Oct. 3	12.24				0.86	1.19					11.38
Oct. 5	11.38	0.56	0.67	0.82	0.99						13.13
Oct. 10	7.57	0.68	0.81	0.96	1.13						7.04
Oct. 12	5.36	0.97	1.05	1.18							4.17
Oct. 13	4.37	0.59	0.95	1.09	1.15						4.37
Oct. 17	5.56	0.94	1.02	1.12	1.32						4.95
Oct. 19	5.36	0.80	0.90	1.08	1.27	1.48	1.29	1.09	0.97	0.83	4.37
Oct. 20	5.56	0.90	0.98	1.14	1.29	1.47	1.25	1.13	1.00	0.90	4.75
Oct. 21	7.04			0.78	1.02		1.00	0.72			8.18
Oct. 22	6.27	0.87	1.01	1.15	1.29	1.55	1.35	1.19	1.07	0.98	3.63
Oct. 23	6.27				1.02						6.02
Oct. 26	6.27	0.79	0.89	1.06	1.30		1.28	1.12	0.98	0.90	3.99
Means		0.79	0.92	1.04	1.15	1.42	1.23	1.05	1.00	0.90	
Departures		+0.04	+0.03	+0.09	+0.03	+0.01	+0.11	+0.11	+0.19	+0.18	

Madison, Wis.

Oct. 1	9.83		0.92	1.03	1.21	1.44					7.29
Oct. 2	9.83			0.81	0.97	1.26					13.13
Oct. 5	7.87						1.10				7.87
Oct. 9	6.27		0.96	1.03	1.28	1.48	1.24				7.29
Oct. 16	6.76	0.85	0.98	1.08	1.23	1.46	1.31				6.02
Oct. 17	4.95		1.11	1.22	1.38						4.75
Oct. 19	5.36						1.17				7.57
Oct. 20	7.04		0.62	0.84	1.06	1.28	1.03				8.81
Oct. 21	8.18				0.92		1.04				9.83
Oct. 24	12.24				1.31						7.29
Oct. 28	5.36	0.63	0.83	1.09	1.31						4.17
Means		(0.74)	0.90	1.01	1.19	1.38	1.15				
Departures		−0.03	−0.01	−0.03	±0.00	−0.02	−0.04				

Lincoln, Nebr.

Oct. 2	9.83	0.53	0.62				1.06				10.21
Oct. 4	12.24					1.42	1.19	0.98	0.85	0.74	12.24
Oct. 14	7.87	0.76		1.05							7.57
Oct. 15	7.29							1.15	1.04	0.95	8.81
Oct. 16	4.57	0.95	1.04	1.15	1.38			1.19	1.05	0.96	5.36
Oct. 17	5.79	0.47	0.70	0.90	1.27		1.31	1.18	1.03	0.93	6.02
Oct. 18	7.29						1.22	1.06	0.91	0.80	7.04
Oct. 19	9.47	0.88	0.97	1.10	1.21						11.38
Oct. 22	7.04	0.73	0.94	1.09	1.20		1.30	1.03			8.48
Oct. 23	11.81						1.19	1.07	0.91	0.80	10.21
Oct. 24	8.23							1.10	0.93	0.85	7.29
Oct. 27	3.30	0.85	0.98	1.10	1.32		1.28	1.16	1.02	0.94	4.57
Oct. 28	4.37		1.03	1.19	1.32						3.81
Means		0.74	0.90	1.08	1.28		1.22	1.10	0.97	0.87	
Departures		−0.11	−0.04	−0.02	±0.00		−0.03	+0.02	+0.02	+0.03	

[1] Extrapolated.

TABLE 2.—*Total solar radiation (direct+diffuse) received on a horizontal surface*

[Gram-calories per square centimeter]

AVERAGE DAILY TOTALS

Week beginning—	Washington	Madison	Lincoln	Chicago	New York	Twin Falls	Pittsburgh	Gainesville	Fresno	La Jolla	Miami	Fairbanks
1931	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Oct. 1	303	280	333	310	273	394	276	----	445	266	474	28
Oct. 8	295	210	272	172	299	394	187	----	428	----	390	25
Oct. 15	284	290	343	292	265	338	211	----	378	----	335	28
Oct. 22	271	187	329	201	276	200	190	----	383	----	462	25
	DEPARTURES FROM WEEKLY NORMLS											
Oct. 1	−26	+11	+10	+97	+14	−8	+25	----	+27	−75	----	----
Oct. 8	−8	−34	−27	−22	+57	+8	−25	----	+34	----	----	----
Oct. 15	+2	+65	+40	+114	+49	−42	+14	----	+12	----	----	----
Oct. 22	+1	−18	+52	+41	+82	−136	+16	----	+51	----	----	----
Accumulated departures on Oct. 28, 1931	−688	+3,311	+2,177	+1,827	+1,890	+4,822	−1,401	----	+1,267	----	----	----

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, Yerkes, 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	
1931	*h*	*m*	°	°	°			
Oct. 1 (Naval Observatory)	11	55	−40.0	309.9	+19.0	----	185	----
			−30.5	319.4	+19.5	31	----	216
Oct. 2 (Naval Observatory)	10	40	−28.0	309.3	+19.0	----	154	----
			−18.5	318.8	+19.0	25	----	179
Oct. 3 (Naval Observatory)	10	33	−14.0	310.2	+19.0	46	----	----
			−5.0	319.2	+19.5	15	----	61
Oct. 4 (Naval Observatory)	10	41	−68.0	243.0	−9.0	62	----	----
			−1.0	310.0	+19.0	46	----	----
			+8.0	319.0	+20.0	6	----	114
Oct. 5 (Naval Observatory)	10	46	−51.0	246.7	−9.5	31	----	----
			+12.0	309.7	+18.0	46	----	77
Oct. 6 (Naval Observatory)	10	48	−38.0	246.5	−10.0	15	----	----
			+26.5	311.0	+17.0	31	----	46
Oct. 7 (Naval Observatory)	11	26	+40.0	311.0	+18.0	15	----	15
Oct. 8 (Naval Observatory)	11	20	----	No spots		----	----	----
Oct. 9 (Naval Observatory)	10	38	----	No spots		----	----	----
Oct. 10 (Naval Observatory)	10	37	----	No spots		----	----	----
Oct. 11 (Naval Observatory)	10	41	----	No spots		----	----	----
Oct. 12 (Naval Observatory)	10	48	----	No spots		----	----	----
Oct. 13 (Naval Observatory)	10	40	----	No spots		----	----	----
Oct. 14 (Mount Wilson)	14	15	+37.0	214.1	+1.0	----	10	10
Oct. 15 (Naval Observatory)	10	44	----	No spots		----	----	----
Oct. 16 (Naval Observatory)	10	29	----	No spots		----	----	----
Oct. 17 (Naval Observatory)	10	44	----	No spots		----	----	----
Oct. 18 (Naval Observatory)	10	55	----	No spots		----	----	----
Oct. 19 (Naval Observatory)	10	50	−77.0	36.0	−15.0	93	----	93
Oct. 20 (Naval Observatory)	10	35	−62.0	37.9	−15.0	93	----	93
Oct. 21 (Naval Observatory)	10	32	−50.0	36.8	−15.0	154	----	154
Oct. 22 (Naval Observatory)	11	5	−37.0	36.3	−16.0	154	----	154
Oct. 23 (Naval Observatory)	11	5	−23.5	36.6	−15.5	154	----	154
Oct. 24 (Naval Observatory)	10	39	−11.0	36.2	−16.0	123	----	123
Oct. 25 (Naval Observatory)	10	41	+2.0	35.9	−16.0	93	----	93
Oct. 26 (Naval Observatory)	10	35	+15.0	35.8	−16.0	123	----	123
Oct. 27 (Naval Observatory)	10	26	+28.0	35.7	−16.0	93	----	93
Oct. 28 (Mount Wilson)	11	40	+43.0	36.8	−15.5	----	121	121
Oct. 29 (Naval Observatory)	10	38	+56.5	37.7	−16.5	62	----	62
Oct. 30 (Naval Observatory)	10	34	+70.0	38.1	−17.0	62	----	62
Oct. 31 (Naval Observatory)	10	40	----	No spots		----	----	----
Mean daily area for October								66

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR OCTOBER, 1931

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

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

October, 1931	Relative numbers	October, 1931	Relative numbers	October, 1931	Relative numbers
1	10	11	7	21	10
2	21	12	0	22	9
3	14	13	Mc 8	23	24
4	a 18	14	9	24	18
5	15	15	8	25	----
6	15	16	0	26	----
7	7	17	0	27	11
8	8	18	0	28	10
9	7	19	d 8	29	9
10	0	20	8	30	----
				31	Wc 18

Mean: 28 days=9.7.

a=Passage of an average-sized group 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 zone.
d=Entrance of a large or average-sized center of activity on the east limb.