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

Week beginning—	Washington	Madison	Lincoln	Chicago	New York	Fresno	Fairbanks	Twin Falls	La Jolla	Miami	New Orleans	Riverside	Blue Hill	San Juan	Friday Harbor	Ithaca	Newport
	Gram-calories per square centimeter																
	cal.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Jan. 1	181	136	217	104	113	114	8	130	264	304	170	241	137	421	83	62	108
Jan. 8	128	95	154	83	100	82	21	97	290	273	182	257	169	465	61	77	149
Jan. 15	72	75	107	64	126	195	14	105	240	326	209	229	198	402	107	129	234
Jan. 22	143	156	245	99	137	241	49	184	336	307	288	320	167	465	89	117	171
	Departures of daily totals from normals																
Jan. 1	+28	+8	+43	+22	+9	−34	+1	−29	+20	+8	+10	+3	0	+61	+74	−28	-------
Jan. 8	−21	−38	−31	+1	−7	−76	+11	−64	+26	−21	−18	+26	+18	+67	−15	−4	-------
Jan. 15	−83	−77	−87	−32	+16	+1	+1	−71	−36	+44	+6	−44	+34	−12	+11	+32	-------
Jan. 22	−32	−28	+16	−19	−13	+14	+20	−4	+50	−22	+91	+47	−22	+29	−6	−27	-------
	Accumulated departures since Jan. 1																
	−756	−945	−413	−196	+35	−665	+231	−1,176	+420	+63	+623	+224	+210	+915	+28	−189	-------

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	Mt. Wilson group number	Heliographic: Diff. in longitude	Heliographic: Longitude	Heliographic: Latitude	Area: Spot or group	Area: Total for each day	Spot count	Observatory
1938	*h. m.*		°	°	°				
Jan. 1	12 47	5713	−61.0	23.9	+5.0	121	-------	4	Mt. Wilson.
		5714	+6.0	90.9	+15.0	24	-------	7	
		5712	+6.5	91.4	−15.5	170	-------	19	
		5704	+23.0	107.9	+15.5	145	-------	27	
		5707	+37.0	121.9	+19.0	242	-------	19	
		5709	+53.0	137.9	−16.0	218	-------	23	
		5699	+64.0	148.9	−11.0	97	-------	4	
		5703	+71.0	155.9	−19.0	97	1,114	12	
Jan. 3	11 14	5716	−45.0	14.4	+16.0	97	-------	11	U. S. Naval.
		5713	−34.5	24.9	+5.5	145	-------	4	
		5715	+19.0	78.4	+38.5	97	-------	7	
		5712	+36.0	95.4	−14.0	121	-------	16	
		5704	+57.0	116.4	+15.0	97	-------	14	
		5707	+63.0	122.4	+20.0	339	-------	11	
		5709	+80.0	139.4	−17.0	339	1,235	14	
Jan. 4	10 50	5718	−81.0	325.5	+9.0	48	-------	1	Do.
		5717	−74.0	332.5	+9.0	48	-------	1	
		5716	−32.0	14.5	+15.0	242	-------	22	
		5713	−21.5	25.0	+5.5	158	-------	5	
		5715	+29.0	75.5	+37.5	97	-------	2	
		5712	+58.0	104.5	−13.5	145	-------	4	
		5704	+63.0	109.5	+18.0	48	-------	1	
		5707	+76.0	122.5	+20.0	436	1,222	5	
Jan. 5	11 4	5719	−75.0	318.1	+20.0	48	-------	3	Do.
		5718	−71.0	322.1	+9.0	48	-------	1	
		5717	−60.0	333.1	+8.5	24	-------	1	
		5716	−19.5	13.6	+14.0	339	-------	20	
		5713	−9.0	24.1	+5.0	194	-------	14	
		5715	+40.5	73.6	+37.5	97	-------	5	
		5712	+66.0	99.1	−14.0	97	847	5	
Jan. 6	10 56	5719	−60.0	320.0	+20.0	97	-------	7	Mt. Wilson.
		5718	−58.0	322.0	+9.5	109	-------	7	
		5716	−5.0	15.0	+12.5	339	-------	24	
		5720	+2.0	22.0	−23.0	24	-------	2	
		5713	+6.0	26.0	+4.0	97	-------	8	
		5715	+53.0	73.0	+37.0	170	-------	6	
		5712	+79.0	99.0	−14.0	97	933	1	
Jan. 7	11 4	5722	−75.0	291.8	−15.0	24	-------	1	U. S. Naval.
		5721	−52.0	314.8	+24.5	48	-------	4	
		5719	−48.0	318.8	+20.0	206	-------	20	
		5718	−45.0	321.8	+9.0	121	-------	12	
		5716	+9.0	15.8	+12.0	582	-------	45	
		5713	+18.0	24.8	+5.0	48	-------	4	
		5715	+66.0	72.8	+37.0	388	1,417	5	
Jan. 8	10 58	5722	−62.0	291.7	−10.0	24	-------	1	Mt. Wilson.
		5721	−39.0	314.7	+24.0	73	-------	5	
		5719	−37.0	316.7	+20.5	291	-------	11	
		5723	−35.0	318.7	−16.5	48	-------	3	
		5718	−31.0	322.7	+9.0	121	-------	5	
		5716	+22.0	15.7	+12.0	776	-------	25	
		5713	+32.0	25.7	+4.5	48	-------	3	
		5715	+80.0	73.7	+39.0	267	1,648	2	
Jan. 9	12 0	5722	−49.0	290.9	−15.0	73	-------	5	U. S. Naval.
		5721	−25.0	314.9	+24.5	121	-------	13	
		5719	−23.0	316.9	+19.5	388	-------	27	
		5718	−14.5	325.4	+9.0	97	-------	6	
		5716	+36.0	15.9	+11.0	533	-------	30	
		5713	+46.0	25.9	+4.0	12	1,224	2	

POSITIONS AND AREAS OF SUN SPOTS—Continued

Date	Eastern standard time	Mt. Wilson group number	Heliographic: Diff. in longitude	Heliographic: Longitude	Heliographic: Latitude	Area: Spot or group	Area: Total for each day	Spot count	Observatory
1938	*h. m.*		°	°	°				
Jan. 10	11 34	5,722	−35.0	292.0	−14.0	73	-------	6	U. S. Naval.
		5,721	−13.0	314.0	+24.5	121	-------	8	
		5,719	−11.0	316.0	+20.0	679	-------	28	
		5,724	−11.0	316.0	−13.0	121	-------	6	
		5,718	−2.0	325.0	+9.0	97	-------	3	
		5,716	+49.0	16.0	+12.0	533	1,624	16	
Jan. 11	11 20	5,725	−76.0	238.0	+25.0	48	-------	2	Mt. Wilson.
		5,722	−22.0	292.0	−16.0	48	-------	5	
		5,721	+1.0	315.0	+25.0	48	-------	4	
		5,724	+3.0	317.0	−13.0	73	-------	5	
		5,719	+4.0	318.0	+20.5	582	-------	22	
		5,718	+12.0	326.0	+8.5	97	-------	6	
		5,716	+63.0	17.0	+12.0	339	1,235	6	
Jan. 12	11 14	5,726	−78.0	222.9	+17.0	679	-------	6	Do.
		5,725	−63.0	237.9	+26.0	145	-------	5	
		5,722	−10.0	290.9	−16.0	48	-------	4	
		5,719	+15.0	315.9	+20.0	921	-------	30	
		5,724	+17.0	317.9	−14.0	36	-------	2	
		5,718	+26.5	327.4	+8.5	73	-------	4	
		5,716	+73.0	13.9	+13.0	242	2,144	4	
Jan. 13	11 27	5,729	−80.0	207.6	+15.0	97	-------	2	U. S. Naval.
		5,728	−78.0	209.6	+21.0	36	-------	1	
		5,726	−65.0	222.6	+17.0	1,939	-------	25	
		5,727	−56.0	231.6	+14.0	170	-------	6	
		5,725	−53.0	234.6	+27.0	388	-------	13	
		5,722	+5.0	292.6	−16.0	48	-------	8	
		5,719	+27.0	314.6	+21.0	1,454	-------	30	
		5,718	+40.0	327.6	+9.0	48	-------	8	
		5,716	+85.0	12.6	+13.0	48	4,228	1	
Jan. 15	10 45	5,729	−53.0	208.6	+14.0	109	-------	2	Do.
		5,728	−47.5	214.1	+21.0	48	-------	6	
		5,726	−36.0	225.6	+17.5	2,812	-------	110	
		5,727	−25.0	236.6	+15.0	291	-------	8	
		5,725	−24.0	237.6	+27.0	218	-------	17	
		5,719	+56.0	317.6	+22.0	1,454	-------	35	
		5,718	+65.0	326.6	+9.0	48	4,980	8	
Jan. 16	12 31	5,730	−53.0	194.5	−11.0	48	-------	4	Mt. Wilson.
		5,729	−38.0	209.5	+13.0	97	-------	3	
		5,728	−33.0	214.5	+20.0	48	-------	4	
		5,726	−22.0	225.5	+17.0	2,909	-------	42	
		5,725	−10.0	237.5	+27.0	121	-------	9	
		5,727	−9.5	238.0	+14.0	242	-------	8	
		5,719	+69.0	316.5	+22.0	1,261	-------	17	
		5,718	+78.0	325.8	+9.0	36	4,762	1	
Jan. 18	10 27	5,732	−78.0	144.3	−14.0	48	-------	1	Do.
		5,731	−71.0	151.3	−12.0	48	-------	1	
		5,729	−11.0	211.3	+12.5	48	-------	2	
		5,726	+4.0	226.3	+17.0	3,151	-------	61	
		5,725	+15.5	237.8	+26.5	73	-------	4	
		5,727	+17.0	239.3	+13.5	242	3,610	7	
Jan. 19	14 30	5,732	−65.0	141.9	−14.5	36	-------	4	Do.
		5,731	−55.0	151.9	−12.0	36	-------	8	
		5,734	−51.0	155.9	−21.0	97	-------	14	
		5,733	−26.0	180.9	−10.0	85	-------	10	
		5,726	+17.0	223.9	+17.0	3,151	-------	145	
		5,725	+30.0	236.9	+26.5	24	-------	4	
		5,727	+32.0	238.9	+13.5	218	3,647	6	
Jan. 20	10 45	5,736	−80.0	115.8	+22.0	194	-------	1	U. S. Naval.
		5,732	−53.0	142.8	−13.5	48	-------	1	
		5,731	−45.0	150.8	−11.0	24	-------	6	
		5,734	−40.0	155.8	−20.0	206	-------	9	
		5,733	−13.0	182.8	−10.0	97	-------	8	
		5,735	+17.0	212.8	+19.0	36	-------	2	
		5,726	+29.0	224.8	+17.0	2,860	-------	44	
		5,725	+40.0	235.8	+27.0	24	-------	3	
		5,727	+42.0	237.8	+13.0	206	3,695	1	

POSITIONS AND AREAS OF SUN SPOTS—Continued

Date	Eastern standard time	Mt. Wilson group number	Heliographic: Diff. in longitude	Heliographic: Longitude	Heliographic: Latitude	Area: Spot or group	Area: Total for each day	Spot count	Observatory
1938	h. m.		°	°	°				
Jan. 21	11 28	5736	−64.0	118.2	+21.0	145	-------	1	Mt. Wilson.
		5732	−38.0	144.2	−14.0	24	-------	2	
		5739	−24.0	158.2	+12.0	16	-------	1	
		5734	−23.0	159.2	−20.0	97	-------	11	
		5738	−20.0	162.2	+16.0	24	-------	1	
		5737	−1.5	180.7	−14.0	16	-------	2	
		5733	+1.5	183.7	−10.0	170	-------	14	
		5726	+43.0	225.2	+18.0	2860	-------	44	
		5725	+54.0	236.2	+27.0	24	-------	2	
		5727	+56.0	238.2	+13.0	194	3,570	1	
Jan. 22	11 21	5745	−77.0	92.1	−12.5	36	-------	1	Do.
		5744	−70.5	98.6	−6.5	48	-------	1	
		5740	−66.0	103.1	−14.0	16	-------	1	
		5736	−50.0	119.1	+21.0	194	-------	1	
		5743	−49.0	120.1	−8.0	16	-------	3	
		5732	−26.0	143.1	−13.0	16	-------	1	
		5739	−11.0	158.1	+12.0	97	-------	12	
		5742	−9.0	160.1	+6.0	24	-------	3	
		5734	−8.0	161.1	−19.0	97	-------	17	
		5741	+11.0	180.1	+7.0	73	-------	3	
		5733	+14.0	183.1	−10.0	388	-------	21	
		5726	+57.0	226.1	+17.0	2424	-------	42	
		5727	+71.0	240.1	+13.0	194	3,623	1	
Jan. 23	11 13	5749	−72.0	84.0	+19.0	73	-------	3	Do.
		5744	−56.0	100.0	−7.0	24	-------	2	
		5740	−52.0	104.0	−13.0	24	-------	1	
		5748	−39.0	117.0	−18.0	16	-------	4	
		5743	−37.0	119.0	−8.0	36	-------	2	
		5736	−37.0	119.0	+21.0	194	-------	1	
		5747	−33.0	123.0	+31.0	36	-------	3	
		5739	+2.5	158.5	+11.0	121	-------	12	
		5734	+7.0	163.0	−20.0	97	-------	17	
		5741	+28.0	184.0	+7.0	24	-------	2	
		5733	+29.0	185.0	−10.0	242	-------	17	
		5726	+70.0	226.0	+17.0	1842	-------	32	
		5727	+86.0	242.0	+13.0	97	2,826	1	
Jan. 24	11 15	5749	−59.0	83.9	+19.0	48	-------	5	Do.
		5745	−47.0	95.9	−13.0	85	-------	8	
		5740	−39.0	103.9	−13.0	8	-------	1	
		5743	−23.0	119.9	−8.0	61	-------	8	
		5736	−23.0	119.9	+21.0	194	-------	1	
		5739	+17.0	155.9	+13.0	97	-------	10	
		5734	+19.5	162.4	−20.5	121	-------	15	
		5750	+41.0	183.9	−6.5	24	-------	4	
		5741	+42.0	184.9	+7.0	12	-------	1	
		5733	+42.0	184.9	−11.0	194	-------	14	
		5726	+82.0	224.9	+17.0	1067	1,911	8	
Jan. 25	11 21	5749	−49.0	80.6	+20.5	97	-------	6	Do.
		5752	−48.0	81.6	+28.0	24	-------	4	
		5745	−33.0	96.6	−13.0	48	-------	6	
		5740	−27.5	102.1	−14.0	97	-------	16	
		5751	−13.0	116.6	+15.0	24	-------	3	
		5736	−10.5	119.1	+21.0	206	-------	2	
		5739	+26.0	155.6	+14.0	24	-------	9	
		5739	+37.0	166.6	+12.0	97	-------	-------	
		5734	+32.0	161.6	−22.0	145	-------	12	
		5733	+54.0	183.6	−11.0	121	-------	7	
		5741	+56.0	185.6	+7.0	8	891	1	
Jan. 26	10 59	5749	−35.0	81.7	+20.0	145	-------	12	Do.
		5752	−33.0	83.7	+29.0	97	-------	13	
		5745	−18.0	98.7	−12.5	36	-------	6	
		5740	−13.0	103.7	−15.0	48	-------	3	
		5751	−1.0	115.7	+14.0	48	-------	4	
		5754	+2.0	118.7	+25.0	36	-------	4	
		5736	+2.0	118.7	+20.5	206	-------	2	
		5753	+7.0	123.7	+28.0	24	-------	1	
		5734	+46.0	162.7	−21.0	24	-------	4	
		5739	+49.0	165.7	+11.0	48	-------	12	
		5733	+69.0	185.7	−12.0	73	785	4	

POSITIONS AND AREAS OF SUN SPOTS—Continued

Date	Eastern standard time	Mt. Wilson group number	Heliographic: Diff. in longitude	Heliographic: Longitude	Heliographic: Latitude	Area: Spot or group	Area: Total for each day	Spot count	Observatory
1938	h. m.		°	°	°				
Jan. 27	11 6	5756	−79.0	24.4	+13.0	242	-------	9	U. S. Naval.
		5752	−23.0	80.4	+27.5	73	-------	5	
		5749	−21.5	81.9	+19.0	97	-------	5	
		5745	−7.0	96.4	−12.0	8	-------	2	
		5740	+2.0	105.4	−15.5	8	-------	1	
		5736	+13.5	116.9	+20.0	194	-------	1	
		5751	+13.5	116.9	+14.0	24	-------	3	
		5755	+25.0	128.4	+12.0	48	-------	6	
		5734	+59.0	162.4	−21.0	24	-------	4	
		5739	+64.0	167.4	+12.0	48	-------	6	
		5733	+80.0	183.4	−11.0	48	814	1	
Jan. 28	11 0	5758	−80.0	10.3	−5.0	48	-------	2	Do.
		5756	−65.0	25.3	+12.0	388	-------	17	
		5757	−1.0	89.3	+15.5	36	-------	4	
		5736	+27.5	117.8	+20.0	194	-------	1	
		5751	+27.5	117.8	+14.0	24	-------	4	
		5755	+38.0	128.3	+11.5	194	-------	15	
		5734	+70.0	160.3	−20.5	12	-------	1	
		5739	+78.0	168.3	+12.0	36	932	1	
Jan. 30	12 47	5760	−79.0	344.0	−11.0	48	-------	2	Do.
		5758	−53.0	10.0	−6.0	73	-------	8	
		5756	−36.0	27.0	+12.5	533	-------	16	
		5759	+7.0	70.0	+26.5	24	-------	3	
		5736	+54.0	117.0	+19.0	194	-------	1	
		5755	+65.0	128.0	+12.0	194	1,066	3	
Jan. 31	14 59	5760	−65.0	343.6	−11.0	97	-------	4	Do.
		5758	−34.0	14.6	−7.0	48	-------	4	
		5756	−24.0	24.6	+12.0	388	-------	1	
		5736	+69.0	117.6	+19.0	145	-------	3	
		5755	+78.0	126.6	+11.0	97	775	3	

Mean daily area for 27 days, 2,102.

NOTE.—Beginning with January 1938 spot counts are furnished with the regular sunspot data. Counts of spots or condensations are made from the original photographs for all regions of activity designated by Mount Wilson group numbers.

PROVISIONAL SUNSPOT RELATIVE NUMBERS FOR JANUARY 1938

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

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

January 1938	Relative numbers	January 1938	Relative numbers	January 1938	Relative numbers
1	*a*	11	*ad* 98	21	*a*
2	*Ec* 109	12	*d*	22	122
3	*Wc* 86	13	106	23	-------
4	76	14	111	24	108
5	*d* 80	15	118	25	94
6	*a*	16	134	26	*a* 76
7	*Ec* 102	17	*b*	27	*Wcd* 67
8	-------	18	*b* 110	28	76
9	59	19	*Ec* 104	29	59
10	92	20	*Mc*	30	*d*
				31	76

Mean, 22 days = 93.8.

a = Passage of an average-sized group through the central meridian.
b = Passage of a large group or spot through the central meridian.
c = New formation of a group developing into a middle sized or large center of activity; *E:* on the eastern part of the sun's disc; *W:* on the western part; *M:* in the central circle zone.
d = Entrance of a large or average-sized center of activity on the east limb.

AEROLOGICAL OBSERVATIONS

[Aerological Division, D. M. LITTLE in Charge]

By L. P. HARRISON

Mean free-air data based on airplane weather and radiometeorograph observations during the month of January 1938, are given in table 1, which includes the basic elements, barometric pressure, temperature, and relative humidity at various standard geometric heights. Close approximation to the corresponding mean values of auxiliary data, such as equivalent potential temperature, mixing ratio, and potential temperature may be readily computed from these elements if desired. All "means" have been computed by the customary method of differences. "Means" have not been computed where there were less than 15 observations at the surface and less than 5 at the standard levels.

Readings of the hair hygrometric apparatus used as the basis for the relative humidities have been discarded when the air temperature has been lower than −40° C. and the air pressure at the same time has been less than 600 mb.

"Departures from normal" are not published here as in the past, owing to the shortness of the periods of record and the different periods over which the records extend.