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

[Gram-calories per square centimeter]

Week beginning—	Washington	Madison	Lincoln	Chicago	New York	Fresno	Albuquerque	Fairbanks	Twin Falls	La Jolla	Miami	New Orleans	Riverside	Blue Hill	Newport	Friday Harbor	Ithaca	Cambridge
	cal.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
July 2	562	745	690	631	584	711	709	529	--------	484	477	360	628	548	602	707	560	571
July 9	570	627	625	545	485	727	712	507	--------	623	465	396	622	476	493	610	484	496
July 16	624	661	583	568	448	711	648	419	--------	631	498	544	660	392	400	627	479	433
July 23	633	408	538	512	437	708	634	354	--------	522	466	553	600	455	484	436	429	522
DEPARTURES FROM WEEKLY NORMALS																		
July 2	+44	+202	+60	+145	+106	−2	--------	+60	--------	−73	00	−45	+21	−42	+66	+126	+29	--------
July 9	+67	+81	+25	+70	+31	+27	--------	+32	--------	+31	−37	−3	+33	−48	−4	+21	+18	--------
July 16	+142	+131	+2	+96	+19	+15	--------	−15	--------	+60	−11	+122	+88	−109	−44	−13	−11	--------
July 23	+143	−104	−23	+37	+17	+14	--------	−80	--------	+24	−44	+156	+52	−9	−10	−160	+7	--------
ACCUMULATED DEPARTURES ON JULY 29, 1940																		
	+3,885	+3,962	−931	+3,787	+5,964	−889	--------	+2,639	--------	−4,571	+1,652	+5,574	−1,134	−4,151	−2,419	+5,810	--------	

POSITIONS, AREAS, AND COUNTS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, U. S. Navy (Ret.), Superintendent, U. S. Naval Observatory.] All measurements and spot counts were made at the Naval Observatory from plates taken at the observatories indicated. Difference in longitude is measured from the central meridian, positive toward the west. Latitude is positive toward the north. Areas are corrected for foreshortening and expressed in millionths of Sun's hemisphere. For each day, under longitude, latitude, area of spot or group, and spot count, are included assumed longitude of center of the disk, assumed latitude of center of the disk, total area of spots and groups, and total spot count.

Date	Eastern standard time	Mount Wilson group No.	Heliographic: Difference in longitude	Heliographic: Longitude	Heliographic: Latitude	Heliographic: Distance from center of disk	Area of spot or group	Spot count	Plate quality	Observatory
1940	*h m*		°	°	°	°				
July 1	11 1	6893	−74	215	+9	74	242	3	G	U. S. Naval.
		(*)	−33	256	−5	34	24	4		
		6892	−11	278	−21	26	24	5		
		6888	+19	308	−15	26	145	15		
		6887	+21	310	+2	21	61	1		
		6888	+28	317	−14	33	194	1		
		6891	+32	321	−1	32	6	2		
		6889	+38	327	+9	38	145	19		
		6878	+78	7	−11	79	12	1		
		6877	+81	10	−18	81	291	1		
				(289)	(+3)		1,144	52		
July 2	11 49	6894	−80	195	−26	80	206	1	F	Do.
		6893	−61	214	+10	61	145	4		
		6888	+31	306	−16	36	121	7		
		6887	+34	309	+2	34	61	1		
		6888	+41	316	−15	45	194	3		
		6889	+52	327	+8	52	145	6		
				(275)	(+3)		872	22		
July 3	10 38	6897	−79	183	−9	79	48	1	P	Mt. Wilson.
		6894	−67	195	−24	70	97	1		
		6893	−48	214	+11	49	145	4		
		6896	+1	263	−8	11	24	3		
		6895	+7	269	+6	8	48	4		
		6888	+45	307	−16	49	97	7		
		6887	+48	310	+2	48	48	1		
		6888	+56	318	−15	60	145	3		
		6889	+66	328	+8	66	97	6		
				(262)	(+3)		749	30		
July 4	14 33	6897	−62	185	−11	64	61	1	G	U. S. Naval.
		6894	−51	196	−25	59	85	1		
		6893	−33	214	+11	34	97	7		
		6896	+14	261	−8	18	12	1		
		(*)	+25	272	−5	27	24	1		
		(*)	+32	279	+5	32	24	4		
		6887	+62	309	+2	62	24	1		
		6888	+69	316	−15	70	145	3		
		6889	+81	328	+9	81	48	1		
				(247)	(+3)		520	20		
July 5	10 57	6900	−51	185	+15	52	6	1	G	Do.
		6897	−50	186	−10	52	48	5		
		6899	−44	192	−15	49	61	6		
		6894	−39	197	−25	47	73	1		
		6898	−33	203	+12	34	73	9		
		6893	−20	216	+10	21	48	3		
		(*)	+51	287	+5	51	6	1		
		6887	+73	309	+2	73	12	1		
		6888	+82	318	−15	82	145	1		
				(236)	(+3)		472	28		

POSITIONS, AREAS, AND COUNTS OF SUN SPOTS—Con.

Date	Eastern standard time	Mount Wilson group No.	Heliographic: Difference in longitude	Heliographic: Longitude	Heliographic: Latitude	Heliographic: Distance from center of disk	Area of spot or group	Spot count	Plate quality	Observatory
1940	*h m*		°	°	°	°				
July 6	10 49	6897	−36	187	−10	38	36	1	F	Mt. Wilson.
		6899	−31	192	−15	36	73	8		
		6894	−26	197	−25	37	73	1		
		6898	−19	204	+12	21	145	18		
		6893	−6	217	+11	10	12	1		
		(*)	+60	283	+5	60	24	5		
				(223)	(+3)		363	34		
July 7	9 10	6897	−31	179	−8	33	6	1	VG	Do.
		6901	−28	182	+18	32	6	1		
		6900	−26	184	+16	28	12	3		
		6897	−23	187	−9	26	36	4		
		6899	−15	195	−13	22	48	7		
		6894	−13	197	−25	31	73	1		
		6898	−7	203	+13	11	218	25		
				(210)	(+4)		399	42		
July 8	11 19	6903	−65	131	−13	67	6	1	G	U. S. Naval.
		6901	−15	181	+17	20	145	6		
		6897	−10	186	−9	16	24	1		
		6900	−10	186	+12	13	6	3		
		6899	−4	192	−12	15	48	5		
		6894	0	196	−25	29	73	1		
		6898	+9	205	+12	12	242	10		
		6902	+14	210	+18	21	66	11		
				(196)	(+4)		610	38		
July 9	10 57	6905	−89	94	+6	89	48	2	G	Do.
		6903	−56	127	−8	58	48	3		
		6904	−20	163	+22	26	24	6		
		6901	−1	182	+16	12	315	35		
		6897	+3	186	−9	13	6	4		
		6900	+3	186	+11	8	6	3		
		6899	+10	193	−12	19	97	7		
		6894	+13	196	−25	31	48	1		
		6898	+20	203	+12	22	97	13		
		6898	+25	208	+13	27	194	1		
		6902	+27	210	+18	31	582	24		
				(183)	(+4)		1,465	99		
July 10	10 56	6905	−76	94	+5	76	970	11	VG	Do.
		6903	−41	129	−11	43	109	13		
		6904	−6	164	+22	19	133	12		
		6901	+14	184	+15	18	194	31		
		6899	+24	194	−11	29	73	12		
		6894	+27	197	−24	39	24	1		
		6898	+34	204	+12	36	48	13		
		6898	+39	209	+12	40	194	1		
		6902	+42	212	+18	44	727	29		
				(170)	(+4)		2,472	123		
July 11	12 27	6905	−63	93	+5	63	921	8	G	Do.
		6903	−26	130	−11	30	170	11		
		6904	+9	165	+21	19	267	14		
		6901	+28	184	+15	22	170	20		
		6899	+40	196	−11	43	48	4		
		6894	+40	196	−24	48	24	1		
		6898	+49	205	+12	50	48	5		
		6898	+52	208	+12	53	194	1		
		6902	+55	211	+18	57	1,164	17		
				(156)	(+4)		3,006	81		

Date	Eastern standard time	Mount Wilson group No.	Heliographic: Difference in longitude	Heliographic: Longitude	Heliographic: Latitude	Heliographic: Distance from center of disk	Area of spot or group	Spot count	Plate quality	Observatory
1940	*h m*		°	°	°	°				
July 12	9 6	6906	−66	78	+8	66	24	6	VG	Mt. Wilson.
		6905	−49	95	+6	49	970	20		
		6903	−13	131	−10	19	145	14		
		6904	+20	164	+22	28	48	17		
		6904	+26	170	+20	30	194	4		
		(*)	+39	183	−11	42	12	3		
		6901	+42	186	+15	44	339	35		
		6894	+53	197	−24	60	12	1		
		6899	+54	198	−11	56	36	6		
		6898	+66	210	+12	66	194	4		
		6902	+67	211	+18	67	1,164	20		
				(144)	(+4)		3,138	130		
July 13	11 0	6906	−53	77	+7	53	48	9	VG	U. S. Naval.
		6905	−35	95	+6	35	727	25		
		6903	+1	131	−11	15	48	12		
		6904	+32	162	+21	36	73	15		
		6904	+39	169	+21	41	194	1		
		6901	+56	186	+14	57	194	27		
		6899	+67	197	−11	68	12	3		
		6898	+79	209	+13	79	194	1		
		6902	+79	209	+19	79	679	6		
		6902	+88	218	+20	88	485	1		
				(130)	(+4)		2,654	100		
July 14	11 3	6907	−71	46	−10	71	48	3	G	Mt. Wilson.
		6906	−39	78	+7	40	24	6		
		6905	−22	95	+7	23	727	26		
		6903	+17	134	−11	23	48	4		
		6904	+51	168	+21	53	194	5		
		6901	+70	187	+14	70	48	2		
				(117)	(+4)		1,089	46		
July 15	11 3	6909	−86	17	−16	86	97	2	G	U. S. Naval.
		6907	−59	44	−11	60	73	3		
		6906	−26	77	+7	27	24	1		
		6905	−8	95	+5	8	727	26		
		6903	+31	134	−11	35	24	1		
		6904	+66	169	+22	67	194	4		
				(103)	(+4)		1,139	37		
July 16	12 16	6909	−72	17	−17	75	194	9	G	Do.
		6907	−46	43	−11	49	24	4		
		6906	−12	77	+6	13	12	3		
		6905	+6	95	+6	7	630	22		
		6908	+23	112	−6	25	48	2		
		6903	+44	133	−11	47	24	2		
		6904	+79	168	+21	79	194	2		
				(89)	(+4)		1,126	44		
July 17	8 41	6909	−65	13	−16	68	24	3	VG	Mt. Wilson.
		6909	−58	20	−15	60	73	4		
		6910	−50	28	−14	52	6	1		
		6907	−33	45	−13	37	18	2		
		6905	+18	96	+7	18	533	30		
		6908	+33	111	−7	35	24	7		
		6903	+55	133	−10	57	6	2		
				(78)	(+5)		684	49		
July 18	11 7	6909	−52	12	−17	56	24	1	G	U. S. Naval.
		6909	−43	21	−16	47	73	5		
		6910	−38	26	−15	43	6	1		
		6907	−19	45	−12	26	12	7		
		6905	+32	96	+8	33	485	28		
		(*)	+33	97	−4	34	6	1		
		6911	+60	124	−10	62	6	1		
				(64)	(+5)		612	44		
July 19	11 14	6914	−75	335	+8	75	48	1	G	Do.
		6913	−63	347	+10	63	48	5		
		6912	−53	357	+26	55	12	7		
		6909	−38	12	−16	43	24	5		
		6910	−29	21	−15	35	12	3		
		6907	−7	43	−12	19	12	6		
		(*)	+9	59	−2	11	6	3		
		6905	+47	97	+8	47	436	12		
		6911	+74	124	−10	76	97	9		
				(50)	(+5)		695	51		
1940	*h m*		°	°	°	°				
July 20	10 27	6915	−72	326	−14	74	6	1	G	Do.
		6914	−61	337	+8	61	12	4		
		6913	−50	348	+10	50	73	20		
		6912	−39	359	+26	43	24	7		
		6909	−24	14	−14	31	6	3		
		6910	−15	23	−12	21	6	2		
		6907	+8	46	−11	18	6	3		
		6905	+60	98	+8	60	388	11		
		6911	+88	126	−11	88	145	1		
				(38)	(+5)		666	52		
July 21	11 5	6917	−71	313	−8	73	24	2	G	Do.
		6915	−58	326	−11	60	24	6		
		6914	−49	335	+9	49	24	5		
		6913	−36	348	+10	36	24	4		
		6912	−27	357	+26	34	48	14		
		6909	−12	12	−14	22	12	9		
		6910	−1	23	−12	16	6	4		
		(*)	+29	53	+13	30	24	4		
		6905	+72	96	+10	72	291	1		
		6905	+72	96	+5	72	48	1		
				(24)	(+5)		525	50		
July 22	8 43	6917	−59	313	−8	60	24	3	G	Mt. Wilson.
		6914	−27	335	+10	38	24	1		
		6913	−24	348	+11	25	24	4		
		6912	−14	358	+27	26	36	5		
		6919	−10	2	−17	24	24	10		
		6918	−3	9	−17	22	12	6		
		6916	+9	21	+23	20	24	3		
		6910	+10	22	−14	22	6	10		
		6905	+86	98	+9	86	242	1		
				(12)	(+5)		416	43		
July 23	8 37	6920	−65	294	+7	65	12	2	F	Do.
		6917	−45	314	−7	48	12	4		
		(*)	−37	322	−13	42	6	2		
		6919	+4	3	−19	24	145	36		
		6918	+12	11	−18	26	6	4		
		6910	+22	21	−12	27	12	10		
				(359)	(+5)		193	58		
July 24	12 6	6921	−73	271	−11	75	48	4	G	U. S. Naval.
		6920	−49	295	+5	49	12	3		
		6917	−31	313	−7	34	12	1		
		(*)	−12	332	+8	13	12	3		
		6919	+19	3	−20	31	194	29		
				(344)	(+5)		278	40		
July 25	10 58	6921	−61	270	−11	63	194	6	F	Do.
		6917	−18	313	−7	22	12	3		
		6919	+32	3	−20	40	242	20		
		6922	+49	20	+24	51	24	5		
				(331)	(+5)		472	34		
July 26	12 8	6923	−69	248	−10	70	48	3	F	Do.
		6921	−47	270	−10	50	267	15		
		6917	−5	312	−7	12	6	2		
		6919	+45	2	−20	51	339	11		
				(317)	(+5)		660	31		
July 27	10 51	6923	−62	243	−10	64	73	10	F	Do.
		6923	−57	248	−11	59	121	1		
		6921	−33	272	−10	36	291	15		
		6917	+10	315	−8	16	6	3		
		6919	+59	4	−19	62	339	9		
				(305)	(+5)		830	38		
July 28	12 4	6924	−82	209	+18	82	485	3	G	Do.
		6923	−48	243	−10	51	73	11		
		6923	−42	249	−11	45	170	3		
		6921	−19	272	−10	24	267	19		
		6919	+69	0	−21	71	24	1		
		6919	+77	8	−19	79	291	13		
				(291)	(+6)		1,310	50		
July 29	11 6	6924	−77	201	+20	77	242	1	G	Do.
		6924	−68	210	+19	69	485	8		
		6925	−53	225	−12	56	48	7		
		6923	−33	245	−9	36	24	4		
		6923	−28	250	−11	34	194	6		
		6921	−10	268	−9	18	24	4		
		6921	−3	275	−8	15	145	9		
				(278)	(+6)		1,162	39		

Date	Eastern standard time	Mount Wilson group No.	Heliographic: Difference in longitude	Heliographic: Longitude	Heliographic: Latitude	Heliographic: Distance from center of disk	Area of spot or group	Spot count	Plate quality	Observatory
1940	h m		°	°	°	°				
July 30	12 4	6924	−63	201	+20	64	218	2	G	Do.
		6924	−55	209	+19	56	436	8		
		6925	−39	225	−12	42	73	8		
		6923	−13	251	−10	21	218	13		
		6926	−10	254	+8	10	73	9		
		6921	+11	275	−8	19	97	5		
				(264)	(+6)		1,115	45		
July 31	11 1	6924	−50	202	+19	51	194	2	G	Do.
		6924	−42	210	+18	44	339	12		
		6925	−27	225	−12	32	97	19		
		6923	−5	247	−8	15	48	8		
		6923	+1	253	−10	16	194	1		
		6926	+3	255	+8	3	97	11		
		6921	+22	274	−8	26	24	9		
		6921	+24	276	−8	29	73	2		
				(252)	(+6)		1,066	64		

Mean daily area for 31 days=1,029.

*Not numbered.
VG=very good; G=good; F=fair; P=poor.

PROVISIONAL RELATIVE SUNSPOT NUMBERS

[Dependent on observations at Zurich only. Data furnished through the courtesy of Prof. W. Brunner, Eidgen. Sternwarte, Zurich, Switzerland]

July 1940	Relative numbers	July 1940	Relative numbers	July 1940	Relative numbers
1	91	11	*a* 125	21	52
2	67	12	126	22	*Mc* 58
3	77	13	101	23	*a* 34
4	47	14	76	24	34
5	*Ec* 56	15	62	25	*Ec* 48
6	*Mc* 44	16	*a* 74	26	37
7	*a* 56	17	*Wc* 60	27	*Ec* —
8	*Mcc* 68	18	62	28	*d* 59
9	*Eac* 97	19	66	29	*a* 53
10	*Mcd* 122	20	67	30	59
				31	*Maac* 67

Mean, 30 days=68.2.

a=Passage of an average-sized group through the central meridian.
b=Passage of a large group 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 disk; 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.

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