POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, U. S. Navy (Ret.) Superintendent, U. S. Naval Observatory. Data from measurements at the U. S. Naval Observatory from plates obtained 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 below longitude, latitude, area of spot or groups, and spot count, are given respectively the assumed longitude of the center of the disk, assumed latitude of the 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
1939	*h. m.*		°	°	°	°				
Dec. 1	12 17	6692	−78	140	−10	79	145	1	G	Mt. Wilson.
		6687	+34	252	−7	33	873	25		
		6684	+38	256	−2	39	61	2		
		6682	+59	277	−12	60	61	1		
		6691	+62	280	−20	64	48	5		
				(218)	(+1)		1,188	34		
3	11 11	6692	−51	142	−9	52	73	1	G	Do.
		6694	+55	248	+4	55	24	2		
		6687	+57	250	−7	58	170	13		
		6687	+65	258	−9	65	339	4		
		6693	+65	258	+6	65	48	3		
		6684	+65	258	−2	65	73	2		
		6682	+88	281	−12	88	48	1		
				(193)	(+1)		775	26		
4	11 30	6692	−38	141	−10	40	121	3	G	U. S. Naval.
		6695	−6	173	+17	17	12	4		
		6694	+66	245	+5	66	24	1		
		6687	+68	247	−7	69	121	6		
		6687	+77	256	−9	78	291	1		
		6684	+77	256	−2	77	73	1		
				(179)	(+1)		642	16		
5	10 55	6692	−24	142	−10	26	73	1	G	Do.
		6696	+8	174	−16	18	24	2		
		6695	+8	174	+17	19	24	3		
				(166)	(0)		121	6		
6	11 5	6692	−11	142	−10	15	97	1	VG	Do.
		6697	−10	143	−15	17	48	3		
		6696	+21	174	−16	26	12	2		
				(153)	(0)		157	6		
7	10 34	6698	−45	95	−18	49	6	1	G	Do.
		6692	+2	142	−10	11	97	1		
		6697	+2	142	−14	15	73	6		
		6692	+6	146	−10	13	24	11		
				(140)	(0)		200	19		
8	11 1	6700	−79	48	+7	79	12	1	G	Do.
		6699	−75	52	−7	76	97	3		
		6697	+16	143	−14	20	121	4		
		6692	+16	143	−10	18	73	1		
		6692	+20	147	−11	23	48	5		
				(127)	(0)		351	14		
9	10 35	6700	−65	49	+7	65	48	2	G	Do.
		6699	−61	53	−7	62	73	2		
		6701	−59	55	−16	60	145	5		
		6692	+29	143	−10	30	73	2		
		6697	+30	144	−14	33	121	4		
		6692	+34	148	−11	35	48	5		
				(114)	(0)		508	20		
10	11 44	6702	−80	20	+30	80	242	1	G	Do.
		6700	−49	51	+7	50	24	1		
		6699	−48	52	−7	49	73	5		
		6701	−45	55	−16	47	242	11		
		6692	+43	143	−10	44	48	1		
		6697	+46	146	−14	48	73	5		
		6692	+49	149	−11	50	24	3		
				(100)	(0)		726	27		
11	10 49	6704	−79	8	+23	78	12	1	VG	Do.
		6702	−67	20	+30	81	291	2		
		6703	−50	37	−16	52	6	3		
		6700	−37	50	+7	38	12	1		
		6699	−36	51	−7	37	73	7		
		6701	−35	52	−16	37	24	11		
		6701	−29	58	−16	33	218	1		
		6692	+57	144	−10	57	24	1		
		6697	+62	149	−14	63	36	1		
		6692	+63	150	−11	63	12	1		
				(87)	(0)		708	29		

POSITIONS AND AREAS OF SUN SPOTS—Continued

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
1939	*h. m.*		°	°	°	°				
Dec. 12	11 7	6705	−75	359	+15	77	6	1	VG	Do
		6704	−66	8	+23	70	145	9		
		6702	−53	21	+30	60	364	3		
		6700	−23	51	+8	24	12	1		
		6699	−22	52	−7	23	85	9		
		6701	−22	52	−17	27	48	5		
		6701	−15	59	−16	22	218	1		
		6692	+70	144	−10	79	24	1		
		6697	+75	149	−14	75	24	1		
				(74)	(−1)		926	31		
13	11 27	6707	−75	346	−7	75	48	2	VG	Mt. Wilson.
		6705	−60	1	+15	62	61	5		
		6704	−52	9	+23	58	121	13		
		6702	−40	21	+30	50	339	17		
		6706	−27	34	+8	27	12	2		
		6703	−21	40	−17	26	12	2		
		6699	−7	54	−7	10	36	6		
		6701	−2	59	−17	16	194	2		
		6692	+85	146	−11	85	6	1		
				(61)	(−1)		829	50		
14	13 17	6707	−60	347	−7	60	12	1	VG	U. S. Naval.
		6705	−47	0	+15	50	24	6		
		6704	−37	10	+23	43	48	12		
		6702	−25	20	+30	41	194	6		
		6706	−15	35	+9	15	61	10		
		6708	+5	49	−16	16	24	4		
		6701	+7	54	−16	17	12	2		
		6699	+9	56	−8	12	48	7		
		6701	+14	61	−15	20	218	1		
				(47)	(−1)		641	49		
15	11 15	6710	−30	4	−13	33	24	1	VG	Do.
		6704	−24	10	+23	34	145	17		
		6702	−14	20	+30	33	218	1		
		6706	+3	37	+8	10	48	10		
		6701	+21	55	−15	25	12	2		
		6699	+22	56	−8	22	24	3		
		6701	+28	62	−15	31	242	6		
				(34)	(−1)		713	40		
16	11 21	6705	−20	1	+16	25	12	1	VG	Mt. Wilson.
		6704	−11	10	+22	23	339	30		
		(*)	−7	14	−25	25	6	1		
		6709	−3	18	−15	13	48	9		
		6702	−1	20	+29	30	218	7		
		6706	+18	39	+8	21	12	1		
		6699	+36	57	−8	28	61	1		
		6701	+41	62	−16	44	194	6		
				(21)	(−1)		890	56		
17	11 45	6712	−81	287	−19	82	6	2	F	U. S. Naval
		6711	−70	298	+14	72	6	1		
		6704	+3	11	+22	23	291	16		
		6709	+11	19	−15	18	48	4		
		6702	+12	20	+30	33	194	1		
		6699	+50	58	−8	50	24	1		
		6701	+56	64	−15	57	121	1		
				(8)	(−1)		690	26		
18	10 28	6712	−68	287	−19	69	97	4	G	Do.
		6704	+15	10	+22	26	339	27		
		6702	+24	19	+30	37	194	1		
		6709	+28	23	−15	32	6	1		
		6706	+39	34	+8	40	24	2		
		6699	+62	57	−8	62	12	1		
		6701	+69	64	−15	69	121	1		
				(355)	(−1)		793	37		
19	10 45	6712	−54	288	−19	56	85	1	G	Do.
		6714	−1	341	−17	16	12	1		
		6713	+7	349	−20	20	6	1		
		6704	+28	10	+22	35	436	30		
		6702	+38	20	+30	48	194	1		
		6701	+81	63	−15	82	12	1		
				(342)	(−1)		745	35		
20	15 36	6716	−88	238	−11	88	97	1	P	Do.
		6715	−72	254	−9	72	97	2		
		6715	−71	255	−11	71	194	3		
		6712	−38	288	−18	41	48	4		
		6713	+22	348	−19	27	6	1		
		6704	+40	6	+22	45	97	11		
		6704	+50	16	+21	54	242	9		
		6702	+51	17	+29	58	194	2		
				(326)	(−2)		975	33		

POSITIONS AND AREAS OF SUN SPOTS—Continued

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
1939	*h. m.*		°	°	°	°				
Dec. 21	10 50	6716	−74	242	−11	75	97	2	VG	Mt. Wilson.
		6715	−61	255	−9	62	73	2		
		6715	−59	257	−11	60	194	7		
		6712	−28	288	−18	33	48	7		
		6704	+52	8	+22	56	73	3		
		6704	+60	16	+21	63	242	9		
		6702	+62	18	+29	67	194	4		
				(316)	(−2)		921	34		
22	11 6	6716	−60	242	−11	60	194	3	G	U. S. Naval.
		6715	−48	254	−9	49	73	1		
		6715	−45	257	−11	46	194	2		
		6712	−14	288	−19	23	24	1		
		6704	+75	17	+22	78	145	2		
		6702	+76	18	+29	80	145	1		
				(302)	(−2)		775	10		
23	11 53	6716	−46	243	−11	47	194	2	F	Do.
		6715	−35	254	−10	36	97	3		
		6715	−31	258	−12	33	170	8		
		6712	−1	288	−19	18	24	1		
				(289)	(−2)		485	14		
24	11 32	6718	−48	228	−21	51	24	4	G	Do.
		6716	−31	245	−11	32	194	1		
		6715	−21	255	−10	23	97	6		
		6715	−19	257	−11	21	145	9		
		6717	−12	264	−10	14	24	5		
		6712	+12	288	−19	21	24	1		
				(276)	(−2)		508	26		
25	13 3	6718	−35	227	−21	40	6	2	F	Mt. Wilson
		6716	−18	244	−11	22	170	4		
		6715	−7	255	−10	11	73	8		
		6715	−5	257	−11	11	97	7		
		6717	+8	270	−8	10	6	1		
		6719	+25	287	+12	27	6	1		
				(262)	(−2)		358	23		
26	11 39	6718	−20	229	−21	28	36	4	VG	U. S. Naval
		6716	−3	246	−11	10	170	1		
		6715	+4	253	−10	10	24	5		
		6715	+9	258	−11	13	145	9		
				(249)	(−2)		375	19		
27	11 31	6718	−7	229	−21	19	6	1	G	Mt. Wilson
		6716	+9	245	−11	12	109	6		
		6715	+22	258	−11	23	97	13		
		6719	+52	288	+12	53	18	4		
				(236)	(−2)		230	24		
28	13 56	6721	−66	156	−16	67	6	2	F	Do.
		6720	−20	202	+19	29	48	6		
		6716	+24	246	−11	26	109	5		
		6715	+35	257	−10	35	97	11		
		6719	+66	288	+13	67	12	5		
				(222)	(−3)		272	29		
29	13 15	6723	−83	126	+16	82	97	1	G	Do.
		6720	−6	203	+19	22	36	7		
		6716	+37	246	−11	36	109	4		

POSITIONS AND AREAS OF SUN SPOTS—Continued

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
1939	*h. m.*		°	°	°	°				
Dec. 29	13 15	6715	+48	257	−10	48	48	9		
		6722	+55	264	+6	56	12	1		
		6719	+78	287	+12	78	12	1		
				(209)	(−3)		314	23		
30	11 54	6723	−69	128	+16	70	194	6	VG	U. S. Naval.
		6721	−65	132	+9	65	48	4		
		6720	+6	203	+19	22	24	4		
		6716	+49	246	−11	49	109	4		
		6715	+60	257	−10	60	12	2		
				(197)	(−3)		387	20		
31	12 4	6725	−66	117	+12	67	12	1	G	Do.
		6723	−54	129	+17	56	194	2		
		6724	−50	133	+9	51	36	4		
		(*)	+22	205	−11	22	6	1		
		6716	+63	246	−12	62	97	4		
		6715	+75	258	−10	75	12	1		
				(183)	(−3)		357	13		

Mean daily area for 30 days=585.

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

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR DECEMBER 1939

[Dependent alone on observations at Zurich]

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

December 1939	Relative numbers	December 1939	Relative numbers	December 1939	Relative numbers
1	*d* 54	11	----------	21	*d* 46
2	40	12	----------	22	47
3	43	13	*a* --	23	* 35
4	----------	14	----------	24	----------
5	----------	15	----------	25	**a* 32
6	*Mc* --	16	*a* 53	26	**a* 37
7	*a* 23	17	*ad* 52	27	----------
8	*d* 47	18	* 61	28	----------
9	----------	19	*d* 44	29	----------
10	*d* --	20	----------	30	*d* 46
				31	34

Mean, 16 days=43.4.

*Observed at Chur.
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.

AEROLOGICAL OBSERVATIONS

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

By B. FRANCIS DASHIELL

Observations of pressures, temperatures and humidities made in the upper air by radiosondes, airplanes and pilot balloons during December are given in tables 1, 2, and 3. The pressures and temperatures, as well as resultant-wind directions and velocities, for 1.5, 3, 4, and 5 kilometers, are shown on charts VIII, IX, X and XI, respectively. Table 4 indicates the average heights of the tropauses, and chart XII presents the December isentropic data. Effective December 1, the United States Navy discontinued airplane observations at Pensacola, Fla., and substituted the use of radiosondes.

The distribution of mean pressure at 5,000 feet was such that the lowest pressure prevailed over the northeastern portion of the United States and the highest over Florida. Pressures reduced to this level showed the lowest to be at Mount Washington, N. H. (828.0 millibars), while the highest occurred in the southern Rocky Mountain region (Durango, Colo., 852.6 millibars). In the upper levels low mean pressure persisted over Sault Ste. Marie, Mich., with the highest over Pensacola and Miami, Fla. Outside the United States proper, the lowest pressures at all levels prevailed over Alaska, with Fairbanks consist-