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 No.	Heliographic: Diff. in longitude	Heliographic: Longitude	Heliographic: Latitude	Area: Spot or group	Area: Total for each day	Spot count	Observatory
1938	*h*	*m*		°	°	°				
Oct. 1	11	16	6130	−42.5	38.4	+20.0	145	-------	11	U. S. Naval.
			6131	−42.0	38.9	−17.0	97	-------	1	
			6127	−13.0	67.9	−8.0	24	-------	5	
			6125	−7.0	73.9	+13.5	73	-------	12	
			6121	+23.0	103.9	+14.0	73	-------	10	
			6116	+50.0	130.9	−14.0	24	-------	4	
			6123	+53.0	133.9	+18.0	24	-------	4	
			6123	+63.0	143.9	+17.0	170	-------	1	
			6112	+59.0	139.9	−12.0	485	-------	6	
			6111	+84.0	164.9	−11.0	291	1,406	2	
Oct. 2	11	28	6130	−29.0	38.6	+20.0	170	-------	14	Do.
			6131	−29.0	38.6	−17.5	73	-------	2	
			6133	−11.0	56.6	−12.0	12	-------	5	
			6127	0.0	67.6	−8.0	36	-------	9	
			6132	0.0	67.6	−12.0	6	-------	3	
			6125	+7.0	74.6	+14.0	48	-------	17	
			6121	+35.0	102.6	+15.0	36	-------	18	
			6116	+63.0	130.6	−14.5	6	-------	2	
			6112	+70.0	137.6	−12.5	121	-------	2	
			6112	+72.0	139.6	−11.0	315	-------	2	
			6123	+78.0	145.6	+17.0	121	944	2	
Oct. 3	10	55	6131	−17.0	37.7	−17.5	73	-------	4	Do.
			6130	−16.5	38.2	+20.0	213	-------	15	
			6133	+2.0	56.7	−11.0	16	-------	4	
			6127	+10.0	64.7	−8.0	6	-------	2	
			6125	+12.5	67.2	+13.0	12	-------	11	
			6125	+23.0	77.7	+13.0	36	-------	9	
			6132	+14.0	68.7	−13.0	12	-------	2	
			6121	+51.0	105.7	+14.0	24	-------	8	
			6112	+89.0	143.7	−12.0	36	433	1	
Oct. 4	10	58	6137	−61.0	340.5	+5.0	12	-------	2	Do.
			6136	−11.5	30.0	+11.0	121	-------	21	
			6130	−3.0	38.5	+20.0	121	-------	17	
			6131	−3.0	38.5	−17.0	78	-------	2	
			6135	+15.0	56.5	+11.0	6	-------	1	
			6133	+15.5	57.0	−11.0	6	-------	1	
			6125	+27.0	68.5	+13.0	6	-------	11	
			6125	+35.0	76.5	+13.0	73	-------	4	
			6132	+28.0	69.5	−14.0	12	-------	3	
			6121	+65.0	106.5	+14.0	36	-------	7	
			6134	+78.0	119.5	+11.0	97	563	7	
Oct. 5	11	7	6141	−84.0	304.2	+17.0	2,424	-------	22	Do.
			6137	−48.0	340.2	+5.0	36	-------	2	
			6136	+2.0	30.2	+11.0	436	-------	32	
			6140	+7.5	35.7	+13.0	12	-------	4	
			6130	+10.0	38.2	+19.5	145	-------	7	
			6131	+10.0	38.2	−17.5	48	-------	1	
			6139	+23.5	51.7	−17.5	24	-------	4	
			6132	+42.0	70.2	−15.0	6	-------	2	
			6125	+48.0	76.2	+12.0	145	-------	14	
			6138	+65.0	93.2	−21.5	24	3,300	2	
Oct. 7	10	38	6141	−57.0	305.1	+17.0	2,909	-------	75	Do.
			6142	−5.0	357.1	+8.0	36	-------	2	
			6136	+27.0	29.1	+11.0	267	-------	20	
			6131	+33.0	35.1	−17.5	85	-------	8	
			6140	+36.0	38.1	+13.0	48	-------	6	
			6130	+39.0	41.1	+19.0	73	-------	2	
			6139	+48.0	50.1	−16.5	24	-------	3	
			6125	+71.5	73.6	+11.5	6	3,448	2	
Oct. 8	10	48	6143	−87.0	261.8	−7.0	145	-------	1	Do.
			6141	−44.0	304.8	+17.0	3,054	-------	175	
			6142	+9.0	357.8	+7.0	97	-------	10	
			6136	+40.0	28.8	+10.0	145	-------	25	
			6131	+47.0	35.8	−18.0	48	-------	3	
			6140	+49.5	38.3	+13.0	97	-------	15	
			6130	+51.0	39.8	+19.0	97	-------	2	
			6139	+63.5	52.3	−18.5	24	3,707	4	
Oct. 9	9	22	6143	−75.0	261.4	−7.0	242	-------	3	Mt. Wilson.
			6145	−43.0	293.4	+15.0	6	-------	1	
			6141	−32.0	304.4	+17.0	3,054	-------	66	
			6144	−5.0	331.4	+12.5	48	-------	4	
			6142	+20.0	356.4	+8.5	97	-------	13	
			6136	+52.0	28.4	+10.5	170	-------	12	
			6131	+60.0	36.4	−18.5	12	-------	1	
			6140	+63.0	39.4	+13.0	145	-------	7	
			6130	+65.0	41.4	+19.0	97	-------	1	
			6139	+76.5	52.9	−18.5	24	3,895	2	
Oct. 10	10	58	6143	−60.0	262.3	−8.0	242	-------	11	U. S. Naval.
			*	−37.0	285.3	+7.0	24	-------	4	
			6145	−27.0	295.3	+14.0	24	-------	4	
			6141	−17.0	305.3	+17.0	3,054	-------	210	
			6144	+10.0	332.3	+11.0	73	-------	5	
			6142	+37.0	359.3	+7.5	73	-------	10	
			6146	+67.0	29.3	+27.0	61	-------	5	
			6136	+70.0	32.3	+11.0	145	-------	7	
			6140	+77.0	39.3	+13.0	36	3,732	4	

POSITIONS AND AREAS OF SUN SPOTS—Continued

Date	Eastern standard time		Mt. Wilson group No.	Heliographic: Diff. in longitude	Heliographic: Longitude	Heliographic: Latitude	Area: Spot or group	Area: Total for each day	Spot count	Observatory
1938	*h*	*m*		°	°	°				
Oct. 11	11	0	6143	−47.0	262.1	−8.0	242	-------	9	U. S. Naval.
			6145	−14.0	295.1	+13.5	24	-------	2	
			6141	−4.0	305.1	+17.0	2,957	-------	230	
			6144	+25.0	334.1	+11.0	48	-------	9	
			6142	+50.0	359.1	+7.5	48	-------	5	
			6147	+60.0	9.1	−22.0	6	-------	2	
			6146	+78.0	27.1	+27.0	24	-------	1	
			6136	+83.0	32.1	+10.5	73	3,422	2	
Oct. 12	11	31	6149	−76.0	219.6	+24.5	12	-------	3	Do.
			6148	−41.0	254.6	−11.5	6	-------	1	
			6143	−33.0	262.6	−7.0	145	-------	6	
			6145	+2.0	297.6	+12.0	97	-------	5	
			6141	+8.0	303.6	+17.0	2,957	-------	110	
			6144	+29.5	335.1	+11.0	145	-------	9	
			6142	+64.5	0.1	+7.5	12	-------	2	
			6147	+74.0	9.6	−22.0	12	3,386	1	
Oct. 13	11	12	6149	−62.0	220.6	+24.5	12	-------	4	Do.
			6151	−53.0	229.6	−7.0	36	-------	9	
			6148	−27.0	255.6	−11.5	6	-------	1	
			6143	−18.0	264.6	−7.0	121	-------	7	
			6145	+15.0	297.6	+12.0	48	-------	5	
			6141	+21.0	303.6	+17.0	2,957	-------	215	
			6144	+53.0	335.6	+11.5	97	3,277	8	
Oct. 14	11	52	6149	−49.0	220.1	+24.5	24	-------	6	Do.
			6151	−39.0	230.1	−7.0	36	-------	10	
			6143	−3.5	265.6	−7.0	73	-------	6	
			6150	+7.0	276.1	+11.0	24	-------	1	
			6145	+27.0	296.1	+13.0	24	-------	10	
			6141	+35.0	304.1	+17.0	2,715	-------	175	
			6144	+67.0	336.1	+11.0	97	2,993	6	
Oct. 15	10	22	6149	−35.0	221.7	+25.5	24	-------	5	Do.
			6151	−26.0	230.7	−7.0	36	-------	12	
			6143	+10.0	266.7	−6.5	61	-------	4	
			6145	+40.0	296.7	+13.0	24	-------	6	
			6141	+48.0	304.7	+17.0	2,715	2,860	190	
Oct. 16	12	13	6152	−63.0	179.5	+26.0	48	-------	2	Do.
			6148	+14.0	256.5	−12.0	48	-------	7	
			6143	+25.0	267.5	−6.5	36	-------	4	
			6141	+60.0	302.5	+17.0	2,424	2,556	60	
Oct. 17	12	44	6152	−48.0	181.0	+26.0	36	-------	6	Do.
			6148	+29.0	258.0	−11.0	97	-------	10	
			6143	+38.5	267.5	−6.5	12	-------	4	
			6141	+75.0	304.0	+17.0	1,697	1,842	60	
Oct. 18	11	20	6154	−78.0	138.6	−11.0	194	-------	2	Do.
			6152	−34.0	182.6	+25.0	6	-------	2	
			6153	−31.0	185.6	−8.0	12	-------	3	
			6148	+43.5	260.1	−10.5	48	-------	8	
			6141	+85.0	301.6	+17.0	291	551	5	
Oct. 19	11	19	6155	−84.0	119.4	+12.5	242	-------	3	Do.
			6154	−63.0	140.4	−11.0	194	-------	2	
			6148	+56.0	259.4	−11.0	291	727	20	
Oct. 20	11	2	6155	−70.0	120.4	+12.5	291	-------	4	Do.
			6156	−69.0	121.4	+24.5	121	-------	6	
			6154	−50.0	140.4	−11.0	194	-------	1	
			6148	+69.0	259.4	−10.5	242	848	13	
Oct. 21	11	35	6155	−58.0	118.9	+12.0	242	-------	4	Do.
			6156	−54.0	122.9	+24.0	388	-------	9	
			6154	−37.0	139.9	−11.0	194	-------	2	
			6157	+47.0	223.9	+26.0	6	830	2	
Oct. 22	11	3	6155	−45.0	119.0	+12.0	242	-------	8	Do.
			6156	−40.0	124.0	+24.0	291	-------	27	
			6154	−24.0	140.0	−11.0	194	-------	2	
			6158	+7.0	171.0	+11.0	61	888	8	
Oct. 23	14	58	6160	−45.0	103.7	−16.0	24	-------	3	Mt. Wilson.
			6155	−31.0	117.7	+12.0	158	-------	8	
			6156	−26.0	122.7	+24.0	291	-------	28	
			6154	−9.5	139.2	−11.0	194	-------	2	
			6158	+20.0	168.7	+12.0	85	-------	6	
			6159	+25.0	173.7	+28.0	24	776	3	
Oct. 24	15	41	6160	−30.0	105.1	−16.0	61	-------	10	Do.
			6155	−16.0	119.1	+13.0	194	-------	20	
			6156	−11.0	124.1	+24.0	339	-------	17	
			6154	+5.0	140.1	−10.5	121	-------	3	
			6158	+37.0	172.1	+13.0	30	-------	4	
			6161	+41.0	176.1	+8.0	12	763	1	
Oct. 25	11	55	6164	−80.0	44.0	+14.0	194	-------	2	U. S. Naval.
			6163	−20.0	104.0	−23.0	24	-------	3	
			6160	−18.0	106.0	−16.0	145	-------	15	
			6162	−8.5	115.5	−20.0	12	-------	3	
			6155	−3.0	121.0	+14.0	121	-------	18	
			6156	+1.0	125.0	+25.0	291	-------	27	
			6154	+16.0	140.0	−11.0	97	-------	3	
			6158	+47.0	171.0	+11.0	12	896	2	
Oct. 26	12	27	6168	−77.0	33.5	+25.0	194	-------	4	Do.
			6164	−66.0	44.5	+14.0	121	-------	1	
			6163	−8.0	102.5	−23.0	24	-------	4	

POSITIONS AND AREAS OF SUN SPOTS—Continued

Date	Eastern standard time	Mt. Wilson group No.	Heliographic: Diff. in longitude	Heliographic: Longitude	Heliographic: Latitude	Area: Spot or group	Area: Total for each day	Spot count	Observatory
1938	*h m*		°	°	°				
Oct. 26	12 27	6166	−8.0	102.5	−11.0	170	-------	20	U. S. Naval.
		6160	−3.0	107.5	−15.0	388	-------	28	
		6155	+9.5	120.0	+13.0	73	-------	9	
		6156	+13.0	123.5	+25.0	194	-------	9	
		6154	+30.0	140.5	−11.0	97	-------	2	
		6158	+61.0	173.5	+11.5	12	1,273	1	
Oct. 27	11 14	6171	−73.0	25.0	+9.0	12	-------	2	Do.
		6168	−64.0	34.0	+26.0	133	-------	5	
		6164	−53.0	45.0	+15.0	182	-------	2	
		6167	−17.0	81.0	−31.0	24	-------	4	
		6163	+5.0	103.0	−25.0	48	-------	10	
		6166	+5.0	103.0	−11.0	242	-------	8	
		6165	+8.0	106.0	−19.0	12	-------	2	
		6160	+11.0	109.0	−15.0	388	-------	20	
		6155	+21.0	119.0	+12.0	48	-------	6	
		6156	+26.0	124.0	+25.0	315	-------	12	
		6154	+41.0	139.0	−11.0	73	1,477	3	
Oct. 28	11 4	6175	−79.0	5.9	+18.0	36	-------	3	Mt. Wilson.
		6171	−60.0	24.9	+10.0	73	-------	13	
		6168	−50.0	34.9	+26.0	242	-------	20	
		6164	−40.5	44.4	+14.0	109	-------	2	
		6174	−22.0	62.9	−15.0	12	-------	5	
		6170	−6.5	78.4	−12.0	61	-------	12	
		6167	−6.0	78.9	−32.0	12	-------	2	
		6173	−4.0	80.9	+13.0	12	-------	2	
		6169	−2.0	82.9	+9.0	48	-------	13	
		6166	+19.0	103.9	−11.0	194	-------	16	
		6163	+20.0	104.9	−22.0	109	-------	12	
		6160	+25.0	109.9	−15.0	388	-------	40	
		6172	+27.0	111.9	−2.0	6	-------	1	
		6155	+35.0	119.9	+13.0	48	-------	6	
		6156	+39.0	123.9	+25.0	291	-------	18	
		6154	+56.0	140.9	−11.0	48	1,689	3	
Oct. 29	14 21	6177	−78.0	351.9	+11.0	145	-------	2	U. S. Naval.
		6176	−73.0	356.9	−9.0	242	-------	4	
		6175	−63.0	6.9	+17.0	61	-------	3	
		6171	−45.0	24.9	+10.0	12	-------	1	
		6168	−37.0	32.9	+26.0	291	-------	23	
		6164	−26.5	43.4	+14.0	121	-------	1	
		6167	+9.5	79.4	−31.5	24	-------	2	
		6173	+10.0	79.9	+15.0	97	-------	2	
		6169	+12.0	81.9	+9.5	61	-------	6	
		6163	+34.0	103.9	−22.5	194	-------	16	
		6166	+34.0	103.9	−11.0	145	-------	10	
		6160	+41.0	110.9	−14.0	388	-------	15	
		6172	+41.5	111.4	−3.0	24	-------	1	
		6156	+51.0	120.9	+27.0	121	-------	6	
		6154	+70.0	139.9	−11.0	6	1,932	1	
Oct. 30	11 33	6177	−65.0	353.2	+11.0	145	-------	4	Do.
		6176	−61.0	357.2	−9.0	218	-------	4	
		6175	−53.0	5.2	+19.0	121	-------	8	
		6171	−35.0	23.2	+10.0	12	-------	2	
		6168	−25.0	33.2	+26.0	291	-------	16	
		6164	−15.0	43.2	+15.0	121	-------	4	
		6179	+6.0	64.2	+16.0	6	-------	1	
		6167	+23.0	81.2	−30.5	12	-------	1	
		6173	+23.0	81.2	+16.0	97	-------	7	
		6169	+24.0	82.2	+9.5	24	-------	4	
		6178	+35.0	93.2	+17.0	6	-------	1	
		6163	+45.0	103.2	−23.0	315	-------	23	
		6166	+49.0	107.2	−11.0	97	-------	4	
		6160	+53.0	111.2	−13.5	485	-------	28	
		6172	+53.0	111.2	−3.0	24	-------	4	
		6156	+64.0	122.2	+27.0	194	2,168	2	

POSITIONS AND AREAS OF SUN SPOTS—Continued

Date	Eastern standard time	Mt. Wilson group No.	Heliographic: Diff. in longitude	Heliographic: Longitude	Heliographic: Latitude	Area: Spot or group	Area: Total for each day	Spot count	Observatory
1938	*h m*		°	°	°				
Oct. 31	11 12	6180	−64.0	341.2	−4.5	36	-------	3	U. S. Naval.
		6177	−52.0	353.2	+11.0	97	-------	3	
		6176	−50.0	355.2	−9.0	218	-------	10	
		6175	−39.0	6.2	+18.0	85	-------	4	
		6181	−24.0	21.2	−12.0	6	-------	4	
		(*)	−16.0	29.2	+14.0	6	-------	1	
		6168	−11.0	34.2	+24.5	315	-------	39	
		6164	−1.0	44.2	+14.5	121	-------	2	
		6173	+37.0	82.2	+15.0	121	-------	3	
		6163	+58.0	103.2	−23.0	315	-------	14	
		6166	+63.0	108.2	−11.0	48	-------	1	
		6160	+65.0	110.2	−13.0	388	-------	12	
		6156	+78.0	123.2	+27.0	194	1,950	3	

Mean daily area for 30 days—1,951. *Not numbered.

PROVISIONAL SUNSPOT RELATIVE NUMBERS FOR OCTOBER 1938

[Dependent alone on observations at Zurich, Switzerland]

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

October 1938	Relative numbers	October 1938	Relative numbers	October 1938	Relative numbers
1	----------	11	----------	21	55
2	94	12	134	22	46
3	55	13	121	23	*EC* 61
4	*Mac*	14	122	24	*a*
5	*Macd* 15	15	103	25	*aa* 91
6	*Mc* 102	16	78	26	*ad* 104
7	92	17	*Mc* 71	27	--------
8	102	18	*d* 31	28	*Mc*
9	*d* 143	19	20	29	*ad* 148
10	152	20	*Ecd* 58	30	--------
				31	*a* 155

Mean, 24 days=93.5.

October 17. Middle large bright chromospheric eruption at $9^h\ 43^m$ to $9^h\ 59^m$ U. T., W.

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 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

During October 1938 a total of 523 aerological observations were made by airplane and radiosonde at 18 points in the United States. The mean free-air data based on these observations are given in tables 1 and 1a. They include the basic meteorological elements of pressure, temperature, and relative humidity, recorded at certain geometric heights. At four stations a maximum height of 21 kilometers was reached during 31 radiosonde observations, while all of the 309 observations listed in table 1a reached a height of 16 kilometers.

The "means" are omitted whenever less than 15 observations are made at the surface and less than 5 at a standard height, but 15 observations are required for those levels that come within the upper and lower limits of the monthly vertical range of the tropopause. A brief description of the methods used for computing these means will be found under "Aerological Observations" in the January 1938 issue of the MONTHLY WEATHER REVIEW.

The month of October was abnormally warm, as shown by chart 1. The mean *surface* temperatures (°F.) were above normal throughout the entire United States, with only minor exceptions along the south Atlantic coast, and in Florida and portions of California. East of the Mississippi River and west of the Rocky Mountains, the departures of mean surface temperature above the normal were moderate, but in the central States and upper Missouri valley the mean temperatures were in excess by as much as 10° F. above the normal. These positive