

POSITIONS AND AREAS OF SUN SPOTS—Continued

Date	East- ern stand- ard time	Mount Wilson group No.	Heliographic				Area of spot or group	Spot count	Plate qual- ity	Observatory
			Dif- fer- ence in lon- gitude	Lon- gitude	Lat- itude	Dis- tance from center of disk				
1939			°	°	°	°				
May 31	h m									
	10 35	6470	-51	79	-21	54	436	21	VG	U. S. Naval.
		6471	-49	81	+13	51	242	6		
		6469	-38	92	-8	39	145	7		
		6473	-35	95	-12	37	97	7		
		6466	-34	96	+10	35	48	15		
		6468	-33	97	-17	57	12	3		
		6465	-23	107	+7	25	388	20		
		6464	-10	120	+22	25	12	6		
		6463	-3	127	-15	16	6	3		
		6472	+27	157	-22	33	12	2		
		6467	+20	159	+20	35	97	2		
		6457	+35	165	+19	40	12	3		
		6456	+39	169	-19	43	145	14		
		6452	+59	189	+25	46	339	23		
			(130)		-1					
							1,991	132		

Mean daily area for 31 days, 1,865.
Plate quality: F, fair; G, good; VG, very good.

PROVISIONAL SUNSPOT RELATIVE NUMBERS FOR MAY 1939

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

May 1939	Relative numbers	May 1939	Relative numbers	May 1939	Relative numbers
1	<i>Ec</i> 163	11	101	21	<i>EWcc</i> ..
2	<i>aad</i> 157	12	<i>EEcc</i> ..	22	-----
3	*133	13	<i>Maac</i> 121	23	<i>a</i> ..
4	141	14	<i>aad</i> ..	24	<i>Eac</i> 106
5	<i>ab</i> 124	15	139	25	-----
6	115	16	118	26	97
7	<i>add</i> 133	17	<i>d</i> 93	27	<i>d</i> 104
8	<i>d</i> ..	18	<i>d</i> 79	28	<i>ad</i> 138
9	-----	19	79	29	<i>add</i> 172
10	<i>EMcc</i> 128	20	-----	30	157
				31	146

Mean, 22 days=124.7.

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*, on the central-circle zone.
d—Entrance of a large or average-sized center of activity on the east limb.
*—Chur.

AEROLOGICAL OBSERVATIONS

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

By B. FRANCIS DASHIELL

The results of 690 individual upper-air observations made during May by airplanes and radiosonde in the United States, Canal Zone, Hawaii, Canada, Bermuda and the north Atlantic, are shown in tables 1 and 1a. Mean atmospheric pressures, temperatures, and resultant winds are indicated on charts VIII, IX, X, and XI. Isentropic data are shown on chart XII. Tables 2 and 3 present upper-air wind data and table 4 gives the mean altitude of the tropopause. A detailed description of these charts and tables will be found in the January 1939 issue of the MONTHLY WEATHER REVIEW.

In the lower levels where observations are made by radiosonde and airplanes, many flights reached all levels. Of the 320 airplane observations made in the United States proper, 80 percent reached 5 kilometers. But, of all the 311 radiosonde flights launched at the surface, 98 percent reached 5 kilometers. And, in the higher levels, 92, 79, and 25 percent of all flights reached 10, 15, and 20 kilometers, respectively. Means were computed for the 22-kilometer level over Nashville, Tenn., Omaha, Nebr., and Washington, D. C., while a few individual flights went even higher; 25 kilometers over St. George's, Bermuda, and 24 kilometers over Omaha, Nebr.

The May mean free-air pressure, temperature (° C.), and humidity, given in table 1a, also includes radiosonde observations for the first time from Barksdale Field, Shreveport, La., and the United States Coast Guard cutters *Champlain* and *Chelan*, when located at Halifax, Nova Scotia, or in an area at sea lying between latitudes 40° and 44° N. and longitudes 47° and 53° W.

A low mean-pressure area prevailed to the north and east of the Great Lakes, then northeastward indefinitely toward Hudson Bay and Newfoundland. However, the lowest pressure in the United States at 1.5, 3, 4, and 5 kilometers, was centered over Sault Ste. Marie, Mich. But it was found that pressures far to the east, over Halifax,

Nova Scotia, were still somewhat lower. On the other hand, pressure was higher east of Halifax, Nova Scotia, for observations by Coast Guard ships at sea (table 1a) revealed pressures that were from 2 to 3 millibars higher than those recorded over Sault Ste. Marie, Mich., at all levels. The highest pressures were located in the south, being centered generally over St. George's, Bermuda, and Pensacola, Fla.

During May low mean pressure prevailed over Fargo, N. Dak., up to 1.5 kilometers; over Sault Ste. Marie, Mich., up to 16 kilometers; and over both stations from 17 to 20 kilometers. The highest mean pressure from the surface up to 1.5 kilometers predominated over St. George's, Bermuda, and then at Pensacola, Fla., up to 5 kilometers. Highest pressure then was located over St. George's, Bermuda, at 5, 6, 7, and 8 kilometers, being exceeded by Shreveport, La., at 9, 10, and 11 kilometers, and Nashville, Tenn., at 12, 13, 14, 15, 16, 17, and 18 kilometers, and Washington, D. C., at 19, 20, 21, and 22 kilometers.

The pressure differences between the low and high areas at Halifax, Nova Scotia, and Bermuda increased steadily with altitude, varying from 7 millibars at 0.5 kilometer to 19 millibars at 5 kilometers. Similar differences between the two pressure extremes within the United States (Sault Ste. Marie, Mich., and Pensacola, Fla.), showed slightly smaller increases with altitude, ranging from 5 to 14 millibars at 0.5 to 5 kilometers, respectively.

Mean free-air temperatures (° C.) during the current month were seasonally warmer than in April at all radiosonde stations in the lower levels, but slightly colder than those recorded in April at the upper levels, with the exception of Oakland, Calif. At Fargo, N. Dak., the mean temperature at 17 kilometers (—61.8° C.) was the lowest recorded over that station since October 1938.