

POSITIONS AND AREAS OF SUN SPOTS—Continued

Date	Eastern standard civil time	Heliographic			Area		Total area for each day
		Diff. long.	Longitude	Latitude	Spot	Group	
1933							
Feb. 10 (Naval Observatory)	11 18	+41.0	301.0	+13.0	62	710	772
Feb. 11 (Naval Observatory)	11 0	+69.0	329.0	+9.0		679	679
Feb. 12 (Naval Observatory)	12 14	+70.0	303.1	+13.0		556	556
Feb. 13 (Perkins Observatory)	12 30	+86.0	305.8	+5.0		125	125
Feb. 14 (Mount Wilson)	14 10	-57.0	148.7	+1.0		4	4
Feb. 15 (Mount Wilson)	17 35	-41.0	149.7	+1.0		3	3
Feb. 16 (Naval Observatory)	11 29		No spots.				
Feb. 17 (Mount Wilson)	12 30		No spots.				
Feb. 18 (Naval Observatory)	12 22		No spots.				
Feb. 19 (Naval Observatory)	11 24		No spots.				
Feb. 20 (Perkins Observatory)	12 30		No spots.				
Feb. 21 (Naval Observatory)	10 51		No spots.				
Feb. 22 (Naval Observatory)	11 10		No spots.				
Feb. 23 (Naval Observatory)	11 18		No spots.				
Feb. 24 (Naval Observatory)	11 15		No spots.				
Feb. 25 (Perkins Observatory)	15 35		No spots.				
Feb. 26 (Naval Observatory)	13 4		No spots.				
Feb. 27 (Naval Observatory)	11 40	-63.0	332.9	+7.0		31	31
Feb. 28 (Naval Observatory)	11 29	-72.0	310.8	+16.0		123	123
Mean daily area for February							437

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR FEBRUARY, 1933

[Dependent alone on observations at Zurich and its station at Arosa]
[Data furnished through the courtesy of Prof. W. Brunner, University of Zurich, Switzerland]

February 1933	Relative numbers	February 1933	Relative numbers	February 1933	Relative numbers
1	ad 45	11		21	0
2		12	16	22	0
3	67	13	11	23	0
4		14	8	24	0
5	a 62	15	0	25	0
6	b 69	16	0	26	0
7	b 80	17	0	27	8
8	53	18	0	28	d 14
9	46	19	0		
10	32	20	0		

Mean: 25 days=20.4.

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 center of activity: E. on the eastern part of the sun's disk; W. on the western part; M. in the central zone.
d= Entrance of a large or average-sized center of activity on the east limb.

AEROLOGICAL OBSERVATIONS

[Aerological Division, W. R. Gregg, in charge]

By L. T. SAMUELS

Free-air temperatures during February were considerably below normal at the northern stations with the largest departures occurring at Ellendale. Temperatures at the southern stations averaged above normal with the largest departures at Atlanta. Table 1 shows that, contrary to the usual inverse relationship between the monthly temperature and relative humidity departures, this relationship was direct at most stations. Under such conditions there often is found a correlation between the monthly precipitation and relative humidity departures. Such a relationship was strikingly apparent at those stations having temperature and relative humidity

departures of the same sign, e.g., Chicago, -0.92 in.; Atlanta, +0.87 in.; Omaha, -0.64 in.; Cleveland, -0.52 in.; and Dallas, +0.34 in.

As would be expected from the fact that the normal latitudinal temperature gradient was intensified by the super-normal temperatures over the south and subnormal temperatures over the north, the resultant wind velocities for the month were considerably above normal. Resultant free-air wind directions were close to normal over most of the country. The greatest deviations occurred over the north Pacific States where the normal southwesterly component was replaced by one from the northwest.

TABLE 1.—Free-air temperatures and relative humidities during February 1933

TEMPERATURE (°C.)

Altitude (meters) m.s.l.	Atlanta, Ga. (303 meters) ¹		Boston, Mass. (6 meters) ²		Chicago, Ill. (187 meters) ³		Cleveland, Ohio (246 meters) ³		Dallas, Tex. (146 meters) ⁴		Ellendale, N. Dak. (444 meters)		Omaha, Nebr. (300 meters) ⁵		San Diego, Calif. (9 meters) ⁶		Washington, D. C. (2 meters) ⁶	
	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal
Surface	5.4	(?)	-0.6		-6.5	(?)	-3.4	(?)	4.2	(?)	-12.1	-2.4	-6.0	(?)	10.1	-2.5	.0	-1.7
500	5.9	(?)	-4.0		-6.2	(?)	-4.1	(?)	5.3	(?)	-12.3	-2.6	-6.1	(?)	10.5	-1.3	.3	-7
1,000	5.9		-5.4		-6.8	-3.0	-6.4	-2.6	5.6	-1.6	-11.5	-2.9	-4.1	-0.7	8.8	-1.4	-4	+2
1,500	5.8	+1.8	-7.1		-8.0	-3.2	-7.6	-2.8	5.2	-7	-12.4	-4.3	-4.4	-1.4				
2,000	4.5	+2.4	-8.9		-9.3	-3.0	-8.8	-2.5	4.7	+7	-14.1	-4.6	-6.4	-2.1	4.3	-1.1	-2.9	+6
2,500	2.7	+3.0	-11.0		-11.6	-3.4	-10.8	-2.6	2.3	+7	-16.9	-5.1	-8.7	-2.2				
3,000	.6	+3.4	-13.3		-14.4	-3.8	-13.4	-2.8	-1	+8	-19.3	-4.8	-11.4	-2.3	-7	-1.3	-6.8	+8
4,000	-5.4	+3.2	-19.0		-19.3	-2.8	-19.1	-2.6	-5.5	+3			-17.6	-2.9			-11.2	+2.8
5,000	-12.1	+2.1	-26.3		-25.7	-2.7	-26.2	-3.2	-12.4	-9			-23.9	-2.4				

RELATIVE HUMIDITY (PERCENT)

Surface	83	(?)	68		78	(?)	75	(?)	82	(?)	76	-5	72	(?)	67	-1	71	0
500	80	(?)	66		72	(?)	73	(?)	74	(?)	75	-5	66	(?)	59	-3	62	-1
1,000	82	-20	64		64	-7	70	-1	61	-2	68	-2	54	-10	51	-4	56	-4
1,500	70	+14	61		59	-3	62	0	57	+2	65	+3	49	-8				
2,000	64	+11	59		52	-5	55	-2	47	0	64	+5	45	-8				
2,500	62	+11	57		48	-8	50	-6	46	+2	65	+6	41	-11	40	-3	52	-1
3,000	58	+9	54		47	-10	52	-5	45	+3	60	+2	41	-11	30	-1	52	+2
4,000	54	+8	51		47	-10	50	-7	41	+5			45	-5			54	+3
5,000	49	+3	49		47	-11	55	-3	40	+8			41	-9				

Weather Bureau airplane observations made near 5 a.m.; Navy airplane observations near 7 a.m.; Ellendale kite observations near 9 a.m. (seventy-fifth meridian time).

¹ Temperature and humidity departures based on normals of Due West, S.C.

² Airplane observations made by Massachusetts Institute of Technology.

³ Temperature and humidity departures based on normals of Royal Center, Ind.

⁴ Temperature departures based on normals determined by interpolating between those of Groesbeck, Tex., and Broken Arrow, Okla. Humidity departures based on normals of Groesbeck, Tex.

⁵ Temperature and humidity departures based on normals of Drexel, Nebr.

⁶ Naval air stations.

⁷ Surface and 500-meter departures omitted because of difference in time of day between airplane observations and those of kites upon which the normals are based.