

Positions and areas of sun spots—Continued

Date	Eastern standard civil time		Heliographic			Area		Total area for each day
			Diff. long.	Longi-tude	Lat-i-tude	Spot	Group	
1929								
Oct. 9 (Naval Observa-tory).	h. 10	m. 32	-49.5 -45.0 -15.5 +10.5 +69.0	110.7 115.2 144.7 170.7 229.2	-11.0 +4.5 -20.0 -8.5 +11.0	478 170 201 22 494		1,365
Oct. 10 (Naval Observa-tory).	10	43	-36.0 -31.0 -2.0 +23.0 +82.0	110.9 115.9 144.9 169.9 228.9	-11.0 +4.0 -20.0 -8.5 +11.5	494 231 355 77 478		1,635
Oct. 11 (Naval Observa-tory).	10	45	-22.5 -17.5 +11.5 +36.0	111.2 116.2 145.2 169.7	-11.0 +4.0 -20.0 -8.0	463 340 556 15		1,374
Oct. 12 (Naval Observa-tory).	10	42	-9.0 -4.5 +25.0	111.5 116.0 145.5	-11.0 +4.0 -19.5	448 417 741		1,606
Oct. 13 (Naval Observa-tory).	10	42	+4.0 +9.5 +38.0	111.3 116.8 145.3	-11.0 +4.0 -20.0	432 355 617		1,404
Oct. 14 (Naval Observa-tory).	10	54	+17.5 +22.5 +50.5	111.5 116.5 144.5	-11.0 +4.5 -20.0	556 309 694		1,559
Oct. 15 (Naval Observa-tory).	13	30	+31.5 +38.0 +66.0	110.9 117.4 145.4	-11.0 +4.5 -21.0	571 278 617		1,466
Oct. 16 (Naval Observa-tory).	10	47	+43.5 +51.0 +78.0	111.2 118.7 145.7	-11.0 +4.0 -21.0	540 216 556		1,312
Oct. 17 (Naval Observa-tory).	10	42	-3.0 +57.5 +68.0	51.6 112.1 122.6	-12.0 -11.5 +3.0	586 185	22	793
Oct. 18 (Naval Observa-tory).	13	14	-73.0 -3.0 +10.5 +71.5 +82.5	327.0 37.0 60.5 111.5 122.5	+12.0 -9.0 -12.5 -12.5 +2.0	9 18 9 617 170		823
Oct. 19 (Naval Observa-tory).	10	41	-61.5 +10.0 +23.5 +84.5	326.7 38.2 61.7 112.7	+11.5 -9.0 -11.5 -11.0	6 18 12 617		653
Oct. 20 (Naval Observa-tory).	10	39	-54.0 +24.0 +38.0	321.0 39.0 63.0	+8.0 -9.0 -11.0	6 31 68		105
Oct. 21 (Naval Observa-tory).	11	9	-72.0 +38.5 +52.5	289.6 40.1 54.1	+12.0 -9.5 -10.5	68 9		123
Oct. 22 (Naval Observa-tory).	14	14	-57.5 +68.5	289.2 55.2	+11.5 -11.5	46 6		52
Oct. 23 (Naval Observa-tory).	10	40	-46.5 +33.5	289.0 9.0	+11.5 -15.5	46 12		58
Oct. 24 (Naval Observa-tory).	10	46	-83.0 -34.0	239.2 288.2	+9.0 +11.5	231 46		277
Oct. 25 (Naval Observa-tory).	11	29	-71.0 -20.5 +17.0	237.6 283.1 325.6	+8.5 +10.5 +9.0	494 18 3		515
Oct. 26 (Naval Observa-tory).	10	39	-59.0 -32.5 -8.5 +30.0	236.9 263.4 267.4 325.9	+8.5 +12.5 +12.0 -8.5	586 18 9 25		638

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			Diff. long.	Longi-tude	Lat-i-tude	Spot	Group	
1929								
Oct. 27 (Naval Observa-tory).	h. 10	m. 41	-46.5 -18.0 +4.0 +40.5	236.2 264.7 286.7 323.2	+9.0 +13.5 +11.5 +9.5		540 216 12 77	845
Oct. 28 (Naval Observa-tory).	10	41	-54.5 -33.5 -4.0 +53.5 +71.0	215.0 236.0 265.5 323.0 340.5	-21.5 +9.0 +13.0 +8.5 -11.0		12 586 355 31 22	1,006
Oct. 29 (Mount Wilson).	12	40	-71.0 -20.0 +10.0 +68.0	184.2 235.2 265.2 323.2	+15.0 +10.0 +15.0 +11.0		8 940 650 6	1,634
Oct. 30 (Mount Wilson).	13	15	-69.0 -60.0 -5.0 +22.0	172.7 181.7 236.7 263.7	+3.0 +15.0 +10.0 +15.0		10 29 1,218 236	1,493
Oct. 31 (Naval Observa-tory).	14	19	-53.5 -46.5 +9.5 +36.5	174.4 181.4 237.4 264.4	+4.0 +16.0 +9.5 +13.5		12 93 571 293	969
Mean daily area for Octo-ber, Naval Observa-tory and Mount Wil-son.								875
Mean daily area for Octo-ber, Naval Observa-tory and Yerkes.								913

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR OCTOBER, 1929<sup>1</sup>

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

October, 1929	Relative numbers	October, 1929	Relative numbers	October, 1929	Relative numbers
1	47	11	77	21	32
2	53	12	b 79	22	22
3	64	13	b 78	23	33
4	b 55	14	63	24	d 17
5	55	15	56	25	
6	Ec 64	16	40	26	Mc 36
7	d 74	17	37	27	Mc 68
8	68	18	26	28	a 97
9	76	19	18	29	57
10	b 84	20	19	30	b 76
				31	Ec 69

Mean, 30 days=54.7.

<sup>1</sup>= Dependent alone on observations at Zurich and its station at Arosa.  
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 large or average-sized 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

By RICHMOND T. ZOCH

Free-air temperatures were below normal at all levels at Broken Arrow, Due West, and Groesbeck and in the lower levels at Royal Center. Free-air temperatures in the upper levels at Royal Center and at all levels at Ellendale were above normal. (See Table 1.)

Free-air relative humidity departures were variable at all of the aerological stations excepting Broken Arrow, where there was a large positive departure at all levels. Vapor-pressure departures also were variable at all stations, excepting Broken Arrow, where they were above normal.

In the lower levels the resultant winds had a southerly component except in the Southeastern States. (See Table 3.) Above 1,000 meters the resultant winds were from the northwest east of the Rocky Mountains. On the Pacific coast the resultant winds were variable.

The kite flight at Ellendale on October 15 is very interesting, in that there was a pronounced inversion up to 107 meters above the surface. Through this stratum the temperature rose 17.4° C., a remarkable increase for this season of the year. A well-defined mirage was observed at the time of this observation.