

The first measurements with the screens will be summarized in the February number of the REVIEW.

Table 1 shows that solar radiation intensities measured at normal incidence were above the normal intensity for January at Washington, slightly below the January normal at Madison and at Lincoln in the morning, but above the normal at Lincoln in the afternoon. The depression in intensities at Lincoln during the morning hours was undoubtedly due to smoke, which was carried away by the wind later in the day.

Table 2 shows a deficiency in the total solar radiation received on a horizontal surface at all stations for which normals have been computed except at Miami, Fla., Fresno and La Jolla, Calif., where an excess was recorded.

No skylight polarization measurements were made at Madison, Wis., as there was a trace of snow on the ground during most of the month, which produces a disturbing effect. At Washington, measurements made on three days give a mean of 62 per cent with a maximum of 66 per cent on the 18th. These are slightly above the respective averages for Washington in January.

TABLE 1.—Solar radiation intensities during January, 1932

[Gram-calories per minute per square centimeter of normal surface]

Washington, D. C.

Date	Sun's zenith distance										Local mean solar time	
	8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°		Noon
	75th mer. time	Air mass										
		A. M.					P. M.					
e.	5.0	4.0	3.0	2.0	1.0	2.0	3.0	4.0	5.0	e.		
Jan. 2	5.79										5.16	
Jan. 11	3.30	0.40									3.45	
Jan. 14	8.18	0.86	0.99	1.14	1.20						9.47	
Jan. 18	3.30					1.30	1.16				3.30	
Jan. 20	3.15			1.12	1.25		1.11	0.95	0.81		3.63	
Jan. 25	2.49	0.85	0.96	1.14	1.38		1.30	1.11	0.99	0.85	2.49	
Jan. 27	5.36			1.10			1.30	1.15	1.01	0.90	3.45	
Means	0.70	0.91	1.10	1.29		1.30	1.13	0.98	0.85			
Departures	-0.03	+0.06	+0.09	+0.06		+0.07	+0.09	+0.09	+0.05			

Madison, Wis.

Jan. 18	2.36						1.20	1.06			2.36
Jan. 20	3.99		0.74	0.82							3.81
Jan. 25	2.36		1.00	1.16	1.31			1.08			2.87
Jan. 27	3.15						1.42	1.29			2.06
Means		(0.87)	(0.99)	(1.31)		(1.42)	1.19	(1.06)			
Departures		-0.17	-0.21	-0.02			-0.01	+0.00			

Lincoln Nebr.

Jan. 8	1.52						1.26	1.16	1.07	1.52
Jan. 17	1.78						1.23	1.07	1.00	2.74
Jan. 18	1.68	0.76	1.05	1.18			1.22	1.07	0.95	2.16
Jan. 19	3.45						1.15	1.00	0.83	4.57
Jan. 23	2.49	1.00	1.12	1.25	1.41	1.00	1.27	1.16	1.06	2.16
Jan. 25	1.78	0.97	1.00				1.12	0.95		3.30
Jan. 27	1.68	0.63	0.81	1.04	1.32			0.95		2.87
Jan. 28	2.49						1.07	0.95	0.85	2.16
Jan. 29	1.02	1.11	1.22				1.48	1.34	1.20	0.74
Means	0.89	1.04	1.16	(1.35)	(1.60)	(1.48)	1.21	1.07	0.99	
Departures	-0.04	-0.01	-0.02	-0.01		+0.14	+0.04	+0.02	+0.06	

1 Extrapolated.

TABLE 2.—Total solar radiation (direct + diffuse) received on a horizontal surface

[Gram-calories per day per square centimeter]

Week, beginning	Average daily totals												
	Washington	Madison	Lincoln	Chicago	New York	Fresno	Pittsburgh	Fairbanks	Twin Falls	La Jolla	Gainesville	Miami	New Orleans
Jan. 1	cal. 89	cal. 59	cal. 120	cal. 41	cal. 50	cal. 217	cal. 70	cal. 4.5	cal. 113	cal. 372	cal. 240	cal. 324	cal. 74
Jan. 8	143	69	161	69	95	143	131	5.8	155	248	263	324	148
Jan. 15	178	116	188	89	118	210	99	5.3	146	274	223	331	236
Jan. 22	163	155	237	139	120	289	75	26.9	223	318	---	397	171
Departures from weekly normals													
Jan. 1	-61	-72	-60	-37	-52	+65	-22	---	-57	+37	-24	+26	---
Jan. 8	-10	-71	-29	-12	-7	-19	+33	---	-29	+12	+18	+29	---
Jan. 15	+18	-43	-12	-6	+5	+20	-10	---	-50	+31	-16	+39	---
Jan. 22	-15	-31	+13	+30	-14	+54	-40	---	+33	+66	---	+85	---
Accumulated departures on Jan. 23													
	-476	-1,519	-616	-175	-476	+840	-273	---	-271	+1,022	---	+1,253	---

POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, Superintendent United States Naval Observatory. Data furnished by Naval Observatory, in cooperation with Harvard, Yerkes, Perkins, and Mount Wilson observatories. The differences of longitude are measured from central meridian, positive west. The north latitudes are plus. Areas are corrected for foreshortening and are expressed in millionths of sun's visible hemisphere. The total area, including spots and groups, is given for each day in the last column]

Date	Eastern standard civil time	Heliographic			Area		Total area for each day
		Dif. long.	Longitude	Latitude	Spot	Group	
1932							
Jan. 1 (Naval Observatory)	11 41	+26.0	243.2	-13.0	108	---	108
Jan. 2 (Naval Observatory)	10 38	-17.0	187.6	+4.5	---	31	---
		+38.5	243.1	-13.0	123	---	154
Jan. 3 (Mount Wilson)	11 15	-70.0	121.1	+11.0	9	---	---
		-4.0	187.1	+4.0	---	10	---
		+50.0	241.1	-13.0	107	---	126
Jan. 4 (Mount Wilson)	17 10	-55.0	119.6	+11.0	6	---	---
		+69.0	243.6	-14.0	152	---	158
Jan. 5 (Mount Wilson)	11 0	+80.0	244.9	-14.0	218	---	218
Jan. 6 (Mount Wilson)	11 30	-30.0	121.6	+13.0	---	8	---
Jan. 7 (Yerkes Observatory)	12 54	No spots			---	---	---
Jan. 8 (Perkins Observatory)	11 45	No spots			---	---	---
Jan. 9 (Perkins Observatory)	10 30	No spots			---	---	---
Jan. 10 (Naval Observatory)	10 25	No spots			---	---	---
Jan. 11 (Naval Observatory)	10 28	No spots			---	---	---
Jan. 12 (Naval Observatory)	12 16	No spots			---	---	---
Jan. 13 (Naval Observatory)	12 53	No spots			---	---	---
Jan. 14 (Naval Observatory)	10 38	No spots			---	---	---
Jan. 15 (Naval Observatory)	10 33	+13.0	46.5	-8.5	---	31	31
Jan. 16 (Naval Observatory)	11 10	+27.0	47.0	-8.0	---	108	108
Jan. 17 (Yerkes Observatory)	12 15	+38.4	44.6	-9.6	6	---	---
		+38.9	45.1	-9.2	6	---	---
		+40.2	46.4	-6.5	6	---	---
		+43.6	49.8	-10.4	30	---	48
Jan. 18 (Naval Observatory)	10 38	+57.0	50.9	-9.5	25	---	25
Jan. 19 (Naval Observatory)	11 13	+69.0	49.4	-10.0	9	---	9
Jan. 20 (Naval Observatory)	11 6	No spots			---	---	---
Jan. 21 (Naval Observatory)	12 3	-72.0	241.6	-12.0	81	---	81
Jan. 22 (Mount Wilson)	11 25	-60.0	240.7	-14.0	---	127	---
		+36.0	336.7	+16.0	---	13	140
Jan. 23 (Yerkes Observatory)	14 59	-44.6	241.1	-13.3	138	---	---
		-41.8	243.9	-13.6	3	---	---
		+54.4	340.1	+14.8	28	---	169
Jan. 24 (Naval Observatory)	13 35	-33.0	240.3	-12.0	108	---	108
Jan. 25 (Naval Observatory)	10 32	-21.5	240.3	-13.0	53	---	---
		+27.0	288.8	-6.0	---	37	90

POSITIONS AND AREAS OF SUN SPOTS—Continued

Date	Eastern standard civil time		Heliographic			Area		Total area for each day
			Diff. long.	Longi-tude	Lati-tude	Spot	Group	
1932	H	m	°	°	°			
Jan. 26 (Mount Wilson).....	12	0	-72.0	176.8	+13.0	211		
			-31.0	216.8	+0.5		7	
			-8.0	239.8	-13.0	154		
			+24.0	271.8	+8.0		27	
			+41.0	288.8	-6.0		22	421
Jan. 27 (Naval Observatory).....	10	17	-64.0	171.6	+12.5	247		
			+5.0	240.6	-13.0	62		309
Jan. 28 (Naval Observatory).....	11	42	-50.0	171.7	+12.5	108		
			+18.0	239.7	-13.0	77		185
Jan. 29 (Perkins Observatory).....	--	--	-36.0	171.5	14.5	96		
			+30.5	238.0	-10.0	80		176
Jan. 30 (Naval Observatory).....	12	46	-22.0	172.7	+13.0	123		
			+46.0	240.7	-13.0	62		185
Jan. 31 (Naval Observatory).....	11	36	-9.5	172.7	+12.5	108		
			+59.0	241.2	-13.0	77		185
Mean daily area for January.....								98

PROVISIONAL SUN-SPOT RELATIVE NUMBERS, JANUARY, 1932

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

January, 1932	Relative numbers	January, 1932	Relative numbers	January, 1932	Relative numbers
1-----	12	11	0?	21	d 8
2-----	25	12	0	22	18
3-----		13	0	23	17
4-----	8	14	Mc	24	16
5-----	8	15	10	25	25
6-----	0?	16	15	26	d 42
7-----	0?	17	12	27	a 36
8-----		18	8	28	18
9-----	0	19	7	29	18
10-----	7	20	0	30	18
				31	17

Mean, 28 days=12.3.

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 circle zone.
 d=Entrance of a large or average sized center of activity on the east limb.

AEROLOGICAL OBSERVATIONS

[The Aerological Division, W. R. GREGG, in charge]

By L. T. SAMUELS

The free-air temperatures for the month were decidedly above normal at most stations and levels. (See Table 1.) At Dallas, Ellendale, and Omaha, negative departures in the lower levels changed to positive at higher elevations. At the more eastern stations the positive departures were exceptionally large while at San Diego they were negative at all levels.

Relative humidities were mostly above normal in the lower levels and below normal in the upper levels.

The resultant winds at 1,000-meter elevation were southerly as compared to a westerly normal in the northern

Gulf region. Elsewhere, the monthly values did not differ appreciably from the normals for this level. At 2,500 meters the westerly component predominated in the monthly resultants. A marked exception occurred at this level at Key West, where the monthly resultant was easterly while the normal is westerly. However, at 3,000 meters at this station the monthly resultant was south-westerly as compared to a normal west-south-westerly.

TABLE 1.—Free-air temperatures and relative humidities during January, 1932

TEMPERATURE (°C.)

Altitude (meters) m. s. l.	Chicago, Ill. ¹ (190 meters)		Cleveland, Ohio ¹ (245 meters)		Dallas, Tex. ² (149 meters)		Due West, S. C. (217 meters)		Ellendale, N. Dak. (444 meters)		Hampton Roads, Va. ³ (2 meters)		Omaha, Nebr. ⁴ (299 meters)		Pensacola, Fla. ³ (2 meters)		San Diego, Calif. ⁵ (9 meters)		Washington, D. C. ³ (2 meters)	
	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	Mean	Departure from normal
Surface.....	-1.0	+3.3	2.8	+7.1	5.5	-0.7	9.4	+3.5	-13.3	-2.2	10.6	+3.3	-8.1	-2.1	14.8	+3.8	11.8	-1.3	5.8	+5.6
500.....	-1.7	+3.7	2.5	+7.9	6.3	+0.5	9.7	+3.8	-12.8	-1.8	9.5	+2.8	-7.3	-1.2	14.1	+3.5	9.7	-1.9	6.5	+6.3
1,000.....	-2.4	+3.0	1.1	+6.5	7.2	+1.5	8.5	+3.5	-8.6	+0.2	7.7	+3.0	-4.7	-0.1	12.5	+3.2	7.8	-2.1	5.6	+6.4
1,500.....	-2.2	+3.7	0.1	+6.0	6.3	+1.3	6.7	+3.2	-7.6	+0.5			-3.0	+1.1						
2,000.....	-3.0	+3.9	-1.7	+5.2	4.8	+1.4	5.3	+3.6	-9.5	+0.1	4.8	+3.8	-3.7	+1.7	9.2	+2.6	3.5	-1.9	3.2	+6.6
2,500.....	-4.9	+3.8	-3.8	+4.9	3.0	+1.7	5.1	+5.3	-11.3	+0.5			-5.8	+1.8						
3,000.....	-7.0	+4.0	-5.9	+5.1	0.6	+1.7	2.5	+4.9	-14.3	+0.1	0.7	+3.7	-8.0	+2.1	5.6	+3.0	0.5	-0.5	0.1	+6.6
4,000.....	-12.2	+3.6	-10.6	+5.2	-5.4	+1.2			-19.9	-0.1			-14.0	+1.4						
5,000.....			-17.2	+5.4	-12.1	+0.6							-20.9	+0.6						

RELATIVE HUMIDITY (PER CENT)

Surface.....	84	+5	80	+1	83	+6	85	+14	87	+6	76	+1	86	+4	86	+4	62	-1	74	+4
500.....	82	+7	80	+5	75	+5	76	+13	84	+5	76	+6	83	+4	80	+5	59	-1	61	-1
1,000.....	76	+11	79	+14	64	+3	69	+12	70	+4	71	+6	73	+7	74	+7	52	0	56	-2
1,500.....	61	+3	70	+12	55	+1	64	+11	62	+3			61	+2						
2,000.....	53	0	67	+14	49	0	56	+7	59	+1	51	+1	53	-4	62	+9	40	0	49	-3
2,500.....	52	-1	64	+11	44	-2	40	-5	57	-1			52	-4						
3,000.....	50	-4	60	+6	42	0	47	+4	58	0	37	-2	51	-5	54	+10	30	+1	34	-9
4,000.....	42	-13	54	-1	38	0			61	+7			43	-10						
5,000.....			51	-8	41	+5							38	-16						

¹ Normals for Royal Center, Ind., used.
² Normals determined by interpolating between those for Groesbeck, Tex., and Broken Arrow, Okla.
³ Naval air stations.
⁴ Normals for Drexel, Nebr., used.