TABLE 2.—*Average daily totals of solar radiation (direct+diffuse) received on a horizontal surface*

Week beginning—	Washington	Madison	Lincoln	Chicago	New York	Fresno	Fairbanks	Twin Falls	La Jolla	Miami	New Orleans	Riverside	San Juan	Friday Harbor	Ithaca	Newport
	Gram-calories per square centimeter															
	cal.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Oct. 29	275	262	278	267	258	330	55	239	303	369	347	295	488	149	168	266
Nov. 5	231	253	300	194	208	305	39	180	250	333	301	229	457	104	147	233
Nov. 12	164	132	193	95	126	276	45	119	292	330	223	253	441	70	87	149
Nov. 19	194	179	204	152	148	205	28	109	293	298	162	263	425	71	121	158
Nov. 26	147	171	204	153	112	254	10	169	232	244	229	240	349	96	111	135
	Departures from weekly normals															
Oct. 29	+27	+69	+38	+113	+78	+13	+15	+13	--------	+44	+67	−9	--------	+12	+22	--------
Nov. 5	+6	+79	+54	+63	+56	−2	+8	−29	--------	+35	+25	−78	--------	−12	+18	--------
Nov. 12	−30	−16	−13	−6	−1	+28	+15	−43	--------	−10	−15	−42	--------	−22	−23	--------
Nov. 19	+5	+44	−2	+33	+20	−28	+8	−45	--------	−27	+35	−7	--------	−25	+17	--------
Nov. 26	−16	+40	+18	+62	+3	+30	−3	+12	--------	−36	+22	−18	--------	−2	+17	--------
	Accumulated departures on—															
	+126	+9,516	+5,439	+6,811	+6,580	+8,414	+2,842	−1,876	--------	−8,743	+5,180	−4,571	--------	−2,002	−6,769	--------

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	Area: Group	Total area for each day	Observatory
1937	*h. m.*		°	°	°				
Nov. 1	11 7	5622	−23.0	146.7	+7.0	--------	533	--------	U. S. Naval.
		5620	−28.5	141.2	−11.0	--------	121	--------	
		5618	−15.0	154.7	+11.0	48	--------	--------	
		5614	+10.0	179.7	+7.5	--------	12	--------	
		5614	+23.0	192.7	+5.0	--------	194	--------	
		5621	+13.0	182.7	−10.5	--------	170	--------	
		5617	+27.0	196.7	−10.5	--------	12	--------	
		5616	+29.0	198.7	+13.5	6	--------	--------	
		5613	+35.0	204.7	−30.0	194	--------	--------	
		5623	+35.0	204.7	+9.5	--------	73	1,363	
Nov. 2	11 12	5627	−78.0	78.4	−9.0	--------	48	--------	Do.
		5620	−13.0	143.4	−11.0	--------	170	--------	
		5625	−10.0	146.4	−17.5	12	--------	--------	
		5622	−10.0	146.4	+7.0	--------	582	--------	
		5618	−2.0	154.4	+11.0	48	--------	--------	
		5621	+27.0	183.4	−10.5	--------	291	--------	
		5614	+36.0	192.4	+5.0	--------	97	--------	
		5616	+43.5	199.9	+14.0	12	--------	--------	
		5623	+49.0	205.4	+10.0	--------	24	--------	
		5613	+50.0	206.4	−29.0	--------	218	1,502	
Nov. 3	11 15	5627	−65.0	78.2	−8.0	--------	73	--------	Mt. Wilson.
		5620	0.0	143.2	−10.5	--------	170	--------	
		5622	+4.0	147.2	+8.0	--------	533	--------	
		5618	+11.0	154.2	+12.0	--------	36	--------	
		5621	+41.0	184.2	−10.0	--------	291	--------	
		5628	+46.0	189.2	+27.0	--------	24	--------	
		5614	+54.0	197.2	+4.5	--------	73	--------	
		5616	+57.0	200.2	+14.0	--------	48	--------	
		5623	+63.0	206.2	+10.0	24	--------	--------	
		5613	+64.0	207.2	−28.0	--------	218	1,490	
Nov. 4	11 28	5627	−50.0	79.9	−8.0	--------	48	--------	U. S. Naval.
		5630	−24.0	105.9	−17.5	--------	12	--------	
		5620	+13.0	142.9	−10.5	--------	170	--------	
		5622	+18.5	148.4	+7.0	--------	339	--------	
		5618	+25.0	154.9	+12.0	24	--------	--------	
		5621	+56.0	185.9	−11.0	--------	145	--------	
		5629	+58.0	187.9	−28.0	--------	48	--------	
		5628	+60.0	189.9	+27.0	6	--------	--------	
		5614	+67.0	196.9	+4.0	--------	6	--------	
		5616	+70.0	199.9	+14.0	6	--------	--------	
		5613	+74.0	203.9	−29.0	--------	97	901	
Nov. 5	11 14	5627	−36.0	80.9	−7.0	--------	48	--------	Mt. Wilson.
		5630	−8.0	108.9	−16.5	--------	24	--------	
		5620	+27.0	143.9	−9.0	--------	145	--------	
		5622	+32.0	148.9	+7.0	--------	194	--------	
		5618	+38.0	154.9	+12.0	12	--------	--------	
		5621	+71.0	187.9	−11.0	97	--------	--------	
		5629	+72.0	188.9	−27.0	--------	242	762	
Nov. 6	11 39	5627	−22.0	81.4	−8.0	--------	48	--------	U. S. Naval.
		5620	+42.0	145.4	−9.0	48	--------	--------	
		5622	+46.0	149.4	+8.0	--------	97	--------	
		5629	+85.0	188.4	−29.0	97	--------	--------	
		5621	+86.0	189.4	−11.0	48	--------	338	

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	Area: Group	Total area for each day	Observatory
	h. m.		°	°	°				
Nov. 7	13 9	5631	−81.0	8.4	+21.0	388	--------	--------	U. S. Naval.
		5627	−7.5	81.9	−8.0	--------	48	--------	
		5622	+59.0	148.4	+8.0	--------	24	460	
Nov. 8	11 2	5632	−71.0	6.4	−15.0	--------	485	--------	Do.
		5631	−68.0	9.4	+21.0	--------	388	--------	
		5633	−50.0	27.4	+14.0	--------	121	--------	
		5627	+6.0	83.4	−8.0	--------	48	1,042	
No. 9	11 0	5632	−58.5	5.7	−16.0	--------	630	--------	Do.
		5631	−53.5	10.7	+21.0	--------	339	--------	
		5633	−47.0	17.2	+13.0	--------	145	--------	
		5635	+1.0	65.2	−15.0	--------	12	--------	
		5627	+19.5	83.7	−8.0	36	--------	--------	
		5634	+44.0	108.2	+16.0	12	--------	1,174	
Nov. 10	11 15	5632	−45.0	5.9	−16.5	--------	727	--------	Do.
		5631	−41.0	9.9	+21.0	--------	291	--------	
		5633	−23.0	27.9	+12.5	--------	121	--------	
		5635	+14.0	64.9	−14.5	--------	48	--------	
		5627	+33.5	84.4	−8.0	24	--------	1,211	
Nov. 11	11 18	5632	−31.5	6.2	−16.5	--------	727	--------	Do.
		5631	−29.0	8.7	+21.0	--------	291	--------	
		5633	−9.0	28.7	+12.0	--------	121	--------	
		5635	+27.0	64.7	−15.0	--------	291	--------	
		5627	+46.0	83.7	−8.0	24	--------	1,454	
Nov. 12	11 9	5637	−69.5	315.1	+7.0	--------	48	--------	Mt. Wilson.
		5636	−30.0	354.6	−22.0	24	--------	--------	
		5632	−18.0	6.6	−15.0	--------	824	--------	
		5631	−14.0	10.6	+22.0	--------	339	--------	
		5633	+7.0	31.6	+11.0	--------	121	--------	
		5635	+41.0	65.6	−15.0	--------	291	1,647	
Nov. 13	13 57	5637	−56.0	313.9	+7.0	--------	48	--------	Do.
		5637	−49.0	320.9	+11.0	24	--------	--------	
		5636	−19.0	350.9	−23.0	--------	36	--------	
		5639	−35.0	334.9	−13.0	12	--------	--------	
		5632	−4.0	5.9	−15.0	--------	679	--------	
		5631	+0.5	10.4	+22.0	--------	242	--------	
		5633	+25.0	34.9	+11.0	--------	73	--------	
		5635	+55.0	64.9	−13.0	--------	242	--------	
		5638	+70.0	79.9	−9.0	--------	48	1,404	
Nov. 14	13 20	5637	−41.0	316.1	+6.0	24	--------	--------	U. S. Naval.
		5639	−19.0	338.1	−16.0	--------	48	--------	
		5632	+9.0	6.1	−16.0	--------	630	--------	
		5631	+13.5	10.6	+22.0	194	--------	--------	
		5633	+39.5	36.6	+11.0	--------	73	--------	
		5635	+70.0	67.1	−13.0	206	--------	1,175	
Nov. 15	11 19	5641	−82.0	263.0	+20.0	97	--------	--------	Do.
		5637	−29.0	316.0	+6.0	24	--------	--------	
		5639	−8.5	336.5	−16.0	--------	12	--------	
		5632	+22.0	7.0	−16.0	--------	533	--------	
		5631	+25.5	10.5	+22.0	194	--------	--------	
		5633	+53.0	38.0	+11.0	97	--------	--------	
		5635	+84.0	69.0	−13.0	97	--------	1,054	
Nov. 16	11 6	5641	−70.0	261.9	+20.5	121	--------	--------	Do.
		5640	−37.0	294.9	−21.0	--------	97	--------	
		5637	−9.0	322.9	+9.0	--------	36	--------	
		5642	+31.0	2.9	+10.5	24	--------	--------	
		5632	+35.0	6.9	−15.5	--------	533	--------	
		5631	+39.0	10.9	+22.0	194	--------	--------	
		5633	+67.0	38.9	+11.0	97	--------	1,102	

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	Area: Group	Total area for each day	Observatory
	h. m.		°	°	°				
Nov. 17	11 5	5645	−84.0	234.7	−18.5	291			U. S. Naval.
		5641	−57.5	261.2	+20.0	97			
		5644	−27.0	291.7	−18.5		48		
		5640	−22.0	296.7	−22.0		97		
		5637	+4.5	323.2	+9.5		73		
		5643	+31.0	349.7	−22.0		48		
		5632	+48.0	6.7	−15.5		388		
		5631	+51.0	9.7	+22.0	194			
		5633	+80.0	38.7	+11.0	97		1,333	
Nov. 18	11 26	5645	−69.0	236.4	−18.5	291			Do.
		5641	−45.0	260.4	+20.0	73			
		5644	−13.5	291.9	+18.5		145		
		5640	−9.0	296.4	−24.0		73		
		5637	+19.5	324.9	+10.5		73		
		5643	+44.0	349.4	−21.0		36		
		5632	+62.0	7.4	−17.0		291		
		5631	+63.0	8.4	+21.0	194		1,176	
Nov. 19	11 24	5645	−56.0	236.2	−18.0	388			Mt. Wilson.
		5641	−31.5	260.7	+21.0	61			
		5644	+1.0	293.2	−18.5		145		
		5640	+3.0	295.2	−22.0		36		
		5637	+33.0	325.2	+11.0		97		
		5643	+59.0	351.2	−21.0		36		
		5632	+77.0	9.2	−17.0	291			
		5631	+78.0	10.2	+22.0	170		1,224	
Nov. 20	11 18	5647	−76.0	203.1	+6.0	24			U. S. Naval.
		5645	−42.0	237.1	−19.0	242			
		5641	−18.5	260.6	+21.0	61			
		5644	+13.5	292.6	−17.5	73			
		5637	+44.0	323.1	+10.5		24		
		5646	+61.0	340.1	−20.0	6		430	
Nov. 21	11 47	5650	−71.0	194.6	−26.0	12			Mt. Wilson.
		5647	−63.0	202.6	+7.0	24			
		5649	−51.0	214.6	−8.0	12			
		5645	−29.5	236.1	−19.0	339			
		5641	−4.0	261.6	+22.0		97		
		5644	+31.0	296.6	−15.0	61		545	
Nov. 22	11 4	5654	−80.0	172.8	+10.0		12		U. S. Naval.
		5653	−63.0	189.8	+12.0		97		
		5647	−50.0	202.8	+6.0	36			
		5645	−16.0	236.8	−19.0	291			
		5641	+8.5	261.3	+19.5	48			
		5644	+42.0	294.8	−14.0	24		508	
Nov. 23	11 4	5654	−66.0	173.7	+9.0	12			Do.
		5653	−50.0	189.7	+13.0		24		
		5647	−36.0	203.7	+7.0	12			
		5655	−14.5	225.2	+18.0	12			
		5645	−3.5	236.2	−19.5	242			
		5641	+20.5	260.2	+20.0	48			
		5648	+29.0	268.7	+8.0	6		356	
Nov. 24	11 6	5653	−38.0	188.5	+13.0		73		Do.
		5647	−22.5	204.0	+7.0	12			
		5645	+10.0	236.5	−19.0	242			
		5641	+33.5	260.0	+20.0	48		375	
Nov. 25	10 58	5653	−27.0	186.3	+15.0	12			Mt. Wilson.
		5657	−15.0	198.3	−12.0	6			
		5647	−8.0	205.3	+7.5	12			
		5656	+11.0	224.3	+10.0	24			
		5645	+23.0	236.3	−18.0	218			
		5641	+48.0	261.3	+21.0	36		308	
Nov. 26	11 44	5654	−22.5	177.2	+10.5		36		Do.
		5660	−8.5	191.2	+7.0		61		
		5653	−6.0	193.7	+13.0		24		
		5659	+25.0	224.7	+18.5		36		
		5656	+25.5	225.2	+9.5		97		

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	Area: Group	Total area for each day	Observatory
	h. m.		°	°	°				
Nov. 26	11 44	5645	+36.0	235.7	−18.0	218			Mt. Wilson.
		5658	+58.0	257.7	+30.0	24			
		5641	+60.0	259.7	+20.5	36		532	
Nov. 27	11 23	5661	−15.0	171.8	−17.0		36		Do.
		5660	+5.0	191.8	+7.0		48		
		5656	+37.5	224.3	+9.5		194		
		5659	+39.0	225.8	+19.0		145		
		5645	+49.5	236.3	−18.0	218		641	
Nov. 28	10 58	5664	−79.5	94.3	−9.0		24		Do.
		5663	−70.0	103.8	+12.0		12		
		5661	−2.5	171.3	−17.5		16		
		5660	+17.0	190.8	+7.0	16			
		5656	+51.0	224.8	+10.0		339		
		5659	+51.0	224.8	+19.0		145		
		5645	+62.0	235.8	−18.5	218			
		5662	+85.0	258.8	−24.5		97	867	
Nov. 29	11 30	5664	−65.0	95.3	−9.5	36			U. S. Naval.
		5666	−14.5	145.8	−10.0		48		
		5665	+4.0	164.3	−17.0		24		
		5656	+64.0	224.3	+9.5		194		
		5659	+67.0	227.3	+19.0		73		
		5645	+75.0	235.3	−18.0		218	593	
Nov. 30	11 4	5664	−50.0	97.4	−10.0	36			Do.
		5666	−2.5	144.9	−9.5	36			
		5656	+78.0	225.4	+9.0	97			
		5659	+79.0	226.4	+19.0		48	217	

Mean daily area for 30 days, =903.

PROVISIONAL SUNSPOT RELATIVE NUMBERS, NOVEMBER 1937

[Dependent alone on observations at Zurich and its station at Arosa]

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

November 1937	Relative numbers	November 1937	Relative numbers	November 1937	Relative numbers
1	104	11	79	21	60
2		12	83	22	
3	*aa* 103	13	*ab* 100	23	*a* 58
4	67	14	106	24	
5	*Wc* 68	15	74	25	*Mc*
6	49	16	69	26	*Mc* 70
7	*d* 34	17	*Ec*	27	96
8	*d* 47	18	*d* 90	28	64
9	*Mc*	19		29	68
10	*Ec*	20	82	30	47

Mean, 22 days=73.5.

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 LOYD A. STEVENS

Mean free-air data, based on airplane weather observations during the month of November 1937, are given in tables 1 to 3. A description of the methods by which the various monthly means and normals therein are computed may be found in the aerological sections of the MONTHLY WEATHER REVIEW for January and March 1937.

It will be noted that many of the "normals" are based on only 3 years of observations. Conclusions based on departures from such short period "normals" must be used with caution.

The mean surface temperatures for November (see Chart I) were generally above normal over the western third of the country, also over New England and the east portion of the North Atlantic states, and below normal elsewhere. The greatest positive departures (+2° to 3° C.) occurred over the central Rocky Mountain region. The negative departures were, for the most part between −1° and −2° C.

With a few exceptions the mean free-air temperatures for the month up to 5 kilometers were below normal. The most significant positive departures occurred over