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	Blue Hill	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.*	*cal.*
Apr. 2	189	405	392	222	262	542	385	437	566	469	351	525	432	613	389	178	420
Apr. 9	436	430	527	462	391	524	333	381	534	420	414	451	437	633	399	356	471
Apr. 16	263	428	521	446	402	615	409	532	502	531	390	512	437	704	426	282	441
Apr. 23	512	349	476	391	504	499	452	507	495	511	451	377	490	674	580	502	591
	Departures of daily totals from normals																
Apr. 2	−188	+36	−16	−62	−57	+27	+52	+6	+48	+4	−19	+28	+60	+44	+78	−72	-------
Apr. 9	+27	+26	+82	+114	+69	−50	−43	−6	+45	−50	+18	−42	+75	+33	+101	+84	-------
Apr. 16	−177	+29	+67	+104	+34	+15	+20	+57	+14	+53	−25	−12	+47	+55	+11	0	-------
Apr. 23	+42	−80	+37	+36	+86	−73	+41	+3	−33	+33	+59	−111	+14	+48	+67	+48	-------
	Accumulated departures since Jan. 1																
	−5,674	−3,353	−1,092	+1,288	+490	−2,674	+2,352	−4,398	−133	−721	+2,695	−1,589	+56	+3,750	+5,026	+3,647	-------

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 or group	Area: Total for each day	Spot count	Observatory
1938	*h*	*m*		°	°	°				
Apr. 1	9	25	5831	−68.0	273.2	−22.0	388	-------	7	Mount Wilson.
			5830	−65.0	276.2	−27.0	194	-------	1	
			5829	−58.0	283.2	+20.0	48	-------	4	
			5832	−57.0	284.2	+16.0	24	-------	1	
			5834	−21.0	320.2	+8.5	16	-------	2	
			5833	−16.0	325.2	−18.0	12	-------	1	
			5826	−9.5	331.7	−21.0	291	-------	19	
			5828	+39.5	20.7	−20.0	48	-------	5	
			5818	+68.0	49.2	−17.0	630	-------	10	
			5818	+85.0	56.2	−13.0	339	1,990	-------	
Apr. 2	9	23	5837	−78.0	250.0	−9.0	242	-------	1	Do.
			5831	−55.0	273.0	−22.0	388	-------	8	
			5830	−52.0	276.0	−27.5	194	-------	2	
			5832	−43.0	285.0	+18.0	36	-------	3	
			5829	−40.5	287.5	+21.0	24	-------	5	
			5836	−40.0	288.0	+9.0	16	-------	2	
			5826	+5.0	333.0	−20.0	291	-------	11	
			5835	+13.0	341.0	−27.0	6	-------	1	
			5818	+82.0	50.0	−17.0	436	1,633	2	
Apr. 3	12	26	5838	−71.0	242.1	+13.0	24	-------	1	U. S. Naval.
			5837	−62.5	250.6	−9.0	218	-------	2	
			5831	−40.0	273.1	−21.5	291	-------	16	
			5830	−37.0	276.1	−27.0	121	-------	2	
			5832	−29.0	284.1	+18.5	12	-------	3	
			5829	−24.5	288.6	+20.0	24	-------	2	
			5836	−24.0	289.1	+9.5	24	-------	2	
			5826	+19.5	332.6	−20.0	242	956	9	
Apr. 4	11	3	5838	−59.5	241.2	+12.5	36	-------	3	Do.
			5837	−49.5	251.2	−9.0	194	-------	2	
			5831	−27.0	273.7	−22.0	267	-------	13	
			5830	−25.0	275.7	−27.0	145	-------	2	
			5832	−13.0	287.7	+18.0	48	-------	2	
			5836	−11.0	289.7	+9.5	12	-------	2	
			5829	−11.0	289.7	+20.0	24	-------	2	
			(1)	+9.0	309.7	−11.5	12	-------	1	
			5833	+25.0	325.7	−17.0	24	-------	1	
			5826	+31.0	331.7	−20.0	194	956	3	
Apr. 5	11	8	5840	−81.0	206.4	−6.0	194	-------	2	Do.
			5839	−52.5	234.9	−7.0	24	-------	6	
			5837	−37.0	250.4	−9.0	194	-------	1	
			5831	−13.0	274.4	−22.0	242	-------	28	
			5830	−12.0	275.4	−27.0	97	-------	2	
			5832	−2.5	284.9	+18.0	48	-------	9	
			5826	+44.0	331.4	−20.0	242	-------	9	
			(1)	+47.5	334.9	+17.0	12	1,053	1	
Apr. 6	14	15	5840	−69.0	203.5	−7.0	339	-------	4	Mount Wilson.
			5839	−38.0	234.5	−7.0	97	-------	2	
			5837	−22.0	250.5	−9.0	194	-------	1	
			5831	+1.0	273.5	−23.0	194	-------	3	
			5830	+2.0	274.5	−28.0	73	-------	1	
			5836	+16.0	288.5	+10.0	145	-------	4	
			5826	+60.0	332.5	−20.0	291	1,333	5	

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 or group	Area: Total for each day	Spot count	Observatory
1938	*h*	*m*		°	°	°				
Apr. 8	12	14	5842	−71.0	176.2	+28.0	970	-------	10	Mount Wilson.
			5840	−44.0	203.2	−7.5	582	-------	35	
			5839	−13.0	234.2	−7.0	48	-------	2	
			5837	+4.5	251.7	−10.0	194	-------	2	
			5831	+27.0	274.2	−23.0	24	-------	2	
			5830	+29.0	276.2	−28.0	61	-------	3	
			5836	+43.0	290.2	+9.5	36	-------	3	
			5826	+85.0	332.2	−23.0	291	2,206	3	
Apr. 9	15	12	5844	−86.0	146.4	−12.0	436	-------	1	U. S. Naval.
			5843	−83.0	149.4	−24.5	582	-------	2	
			5842	−56.0	176.4	+28.0	1,454	-------	16	
			5840	−29.0	203.4	−7.0	388	-------	20	
			5839	+2.0	234.4	−6.5	48	-------	5	
			5837	+19.5	251.9	−9.0	194	-------	3	
			5830	+41.0	273.4	−28.0	121	3,223	1	
Apr. 10	11	41	5844	−74.0	147.1	−11.0	339	-------	3	Do.
			5843	−71.0	150.1	−22.0	679	-------	2	
			5842	−45.0	176.1	+27.5	1,261	-------	14	
			5840	−16.0	205.1	−7.0	388	-------	18	
			5837	+30.0	251.1	−9.5	145	-------	1	
			5830	+52.0	273.1	−28.0	73	-------	1	
			5845	+56.5	277.6	−32.0	36	2,921	2	
Apr. 11	11	3	5843	−69.0	139.3	−21.0	48	-------	2	Do.
			5843	−59.5	148.8	−23.0	630	-------	3	
			5844	−60.0	148.3	−11.0	436	-------	1	
			5842	−33.0	175.3	+27.0	1,164	-------	15	
			5840	−2.0	206.3	−6.0	339	-------	11	
			5837	+44.0	252.3	−10.0	145	-------	2	
			5830	+66.0	274.3	−27.5	73	2,835	1	
Apr. 12	11	18	5844	−47.0	147.9	−11.0	388	-------	2	Do.
			5843	−46.5	148.9	−22.0	679	-------	3	
			5842	−19.0	175.9	+27.0	1,164	-------	12	
			5846	+7.0	201.9	+7.5	48	-------	2	
			5840	+12.0	206.9	−6.0	339	-------	15	
			5837	+58.0	252.9	−10.0	145	-------	1	
			5830	+79.0	273.9	−28.0	24	2,787	1	
Apr. 13	11	9	5843	−33.0	148.8	−23.0	630	-------	8	Do.
			5844	−33.0	148.8	−10.5	388	-------	2	
			5842	−6.0	175.8	+27.0	1,115	-------	27	
			5846	+20.0	201.8	+8.0	97	-------	10	
			5840	+28.0	209.8	−5.0	242	-------	14	
			5837	+70.0	251.8	−10.0	97	2,569	2	
Apr. 14	11	8	5848	−88.0	80.6	−11.0	388	-------	2	Do.
			5847	−33.0	135.6	−7.0	12	-------	2	
			5843	−20.5	148.1	−23.0	630	-------	35	
			5844	−20.0	148.6	−10.5	388	-------	18	
			5842	+8.0	176.6	+27.0	1,018	-------	52	
			5846	+33.0	201.6	+8.0	73	-------	12	
			5840	+44.0	212.6	−5.0	218	-------	9	
			5837	+85.0	253.6	−10.0	97	2,824	2	
Apr. 15	11	3	5848	−76.0	79.5	−10.5	582	-------	9	Do.
			5852	−72.0	83.5	+26.0	48	-------	3	
			5851	−38.0	117.5	+16.0	24	-------	4	
			5843	−9.0	146.5	−23.5	582	-------	30	
			5844	−7.5	148.0	−10.5	388	-------	25	
			5842	+18.0	173.5	+27.0	824	-------	48	

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 or group	Area: Total for each day	Spot count	Observatory
1938	h m		°	°	°				
Apr. 15	11 3	5850	+23.0	178.5	−24.0	36	-------	3	U. S. Naval.
		5842	+30.0	185.5	+25.5	61	-------	2	
		5846	+46.0	201.5	+9.0	24	-------	6	
		5849	+53.0	208.5	+13.0	36	-------	2	
		5840	+58.0	213.5	−5.0	218	2,823	6	
Apr. 16	13 0	5853	−80.0	61.2	−13.0	388	-------	4	Mount Wilson.
		5854	−70.0	71.2	−9.0	97	-------	2	
		5848	−61.0	80.2	−10.5	630	-------	21	
		5843	+6.0	147.2	−23.0	582	-------	28	
		5844	+9.0	150.2	−10.5	242	-------	27	
		5842	+32.0	173.2	+27.0	727	-------	30	
		5850	+37.0	178.2	−24.0	36	-------	7	
		5842	+46.0	187.2	+25.0	61	-------	30	
		5840	+72.0	213.2	−5.0	218	2,981	3	
Apr. 17	9 15	5853	−69.0	61.1	−13.0	533	-------	14	Do.
		5854	−68.0	62.1	−8.0	97	-------	4	
		5848	−52.0	78.1	−10.5	776	-------	53	
		5843	+18.0	148.1	−24.0	582	-------	43	
		5844	+20.0	150.1	−11.0	242	-------	21	
		5842	+44.0	174.1	+27.0	727	-------	58	
		5842	+48.0	178.1	+25.0	61	-------	-------	
		5850	+48.0	178.1	−25.0	36	-------	6	
		5840	+85.0	215.1	−5.0	97	3151	1	
Apr. 18	11 50	5853	−58.0	57.4	−13.0	776	-------	25	Do.
		5854	−53.0	62.4	−8.5	73	-------	2	
		5848	−36.0	79.4	−10.5	873	-------	70	
		5856	−25.0	90.4	−17.0	36	-------	4	
		5843	+31.0	146.4	−24.0	630	-------	25	
		5844	+34.0	149.4	−11.0	242	-------	9	
		5842	+57.0	172.4	+27.0	436	-------	27	
		5855	+63.0	178.4	−8.0	36	-------	6	
		5850	+64.0	179.4	−25.0	6	3108	2	
Apr. 19	10 58	5857	−70.0	32.7	+12.0	48	-------	2	U. S. Naval.
		5854	−38.0	64.7	−8.5	61	-------	2	
		5853	−53.5	49.2	−16.0	121	-------	2	
		5853	−41.0	61.7	−12.0	630	-------	11	
		5848	−24.0	78.7	−10.0	776	-------	15	
		5856	−11.0	91.7	−17.0	36	-------	10	
		5843	+43.0	145.7	−23.0	582	-------	11	
		5844	+48.0	150.7	−10.0	145	-------	2	
		5842	+63.0	165.7	+32.0	48	-------	1	
		5842	+78.0	180.7	+27.0	291	2738	1	
Apr. 20	11 30	5857	−56.0	33.2	+12.0	12	-------	3	Do.
		5853	−40.0	49.2	−16.5	73	-------	1	
		5853	−27.0	62.2	−13.0	582	-------	17	
		5854	−25.0	64.2	−8.5	61	-------	3	
		5848	−10.0	79.2	−10.0	679	-------	28	
		5858	+49.0	138.2	−3.0	16	-------	3	
		5843	+57.0	146.2	−23.0	436	-------	9	
		5844	+60.0	149.2	−9.0	97	-------	3	
		5842	+79.0	168.2	+32.0	48	2004	1	
Apr. 21	11 0	5853	−28.5	47.7	−16.5	73	-------	5	Do.
		5853	−15.0	61.2	−13.0	630	-------	8	
		5854	−12.0	64.2	−9.0	61	-------	1	
		5848	+3.0	79.2	−10.0	679	-------	20	
		5859	+41.5	117.7	+19.0	36	-------	5	
		5843	+69.0	145.2	−24.0	388	-------	3	
		5844	+70.0	146.2	−10.0	48	1915	1	
Apr. 22	9 51	5862	−85.0	338.7	+8.0	194	-------	1	Mount Wilson.
		5863	−84.0	339.7	−11.0	194	-------	2	
		5861	−17.5	46.2	+9.0	48	-------	3	
		5853	−16.0	47.7	−17.0	97	-------	27	
		5853	−3.0	60.7	−13.0	533	-------	-------	
		5854	+0.5	64.2	−9.0	48	-------	2	
		5848	+15.0	78.7	−10.5	582	-------	19	
		5859	+59.0	120.7	+19.5	48	-------	8	
		5843	+81.0	144.7	−25.0	291	2035	1	
Apr. 23	10 27	5865	−78.0	332.1	−18.5	121	-------	1	U. S. Naval.
		5863	−71.0	339.1	−10.5	242	-------	4	
		5862	−69.5	340.6	+9.0	194	-------	1	
		5864	−63.0	347.1	+13.0	48	-------	4	
		5853	−2.0	48.1	−17.0	73	-------	1	
		5853	+13.0	63.1	−13.0	485	-------	11	
		5854	+15.0	65.1	−9.0	36	-------	2	
		5848	+29.0	79.1	−10.0	533	-------	17	
		5859	+70.0	120.1	+19.5	12	1744	2	
Apr. 24	10 33	5865	−65.0	331.9	−19.0	194	-------	2	Do.
		5863	−58.0	338.9	−10.0	242	-------	4	
		5862	−55.0	341.9	+8.5	194	-------	2	
		5864	−52.0	344.9	+13.0	242	-------	20	
		5853	−11.0	47.9	−17.0	61	-------	9	
		5853	+25.0	61.9	−13.0	388	-------	12	
		5848	+43.0	79.9	−10.0	485	1806	20	
Apr. 25	11 11	5865	−51.0	332.3	−19.0	121	-------	1	Do.
		5863	−44.0	339.3	−10.0	194	-------	4	
		5862	−40.0	343.3	+9.0	194	-------	2	
		5864	−37.0	346.3	+12.0	242	-------	18	
		5853	+25.0	348.3	−16.0	61	-------	1	
		5853	+40.0	63.3	−13.0	436	-------	3	
		5854	+39.5	62.8	−10.0	12	-------	1	
		5848	+57.0	80.3	−9.5	485	1745	6	

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 or group	Area: Total for each day	Spot count	Observatory
1938	h m		°	°	°				
Apr. 26	10 46	5868	−87.0	283.3	−20.0	194	-------	1	U. S. Naval.
		5867	−85.0	285.3	−27.0	388	-------	3	
		5865	−38.0	332.3	−19.0	97	-------	2	
		5863	−30.0	340.3	−10.0	218	-------	10	
		5862	−29.0	341.3	+9.0	194	-------	4	
		5864	−24.0	346.3	+12.0	388	-------	25	
		5866	−7.5	2.8	+24.0	24	-------	5	
		5853	+38.0	48.3	−16.0	48	-------	1	
		5853	+52.0	62.3	−13.0	291	-------	2	
		5848	+71.0	81.3	−9.0	485	2327	3	
Apr. 27	11 4	5870	−87.0	269.9	−30.5	48	-------	1	Do.
		5868	−77.0	279.9	−20.0	145	-------	3	
		5869	−76.0	280.9	+24.5	97	-------	1	
		5867	−71.0	285.9	−27.0	388	-------	4	
		5865	−25.0	331.9	−19.0	73	-------	1	
		5863	−15.0	341.9	−10.0	97	-------	9	
		5862	−15.0	341.9	+10.0	194	-------	1	
		5864	−10.0	346.9	+13.0	388	-------	11	
		5866	+4.0	0.9	+24.0	73	-------	7	
		5853	+50.5	47.4	−16.0	36	-------	1	
		5853	+68.0	64.9	−13.0	291	-------	1	
		5848	+88.0	84.9	−10.0	97	1927	1	
Apr. 28	11 2	5872	−79.0	264.8	−22.0	145	-------	3	Do.
		5871	−78.0	265.8	+23.0	242	-------	2	
		5870	−71.0	272.8	−30.0	97	-------	3	
		5867	−69.0	274.8	−25.0	48	-------	2	
		5868	−62.0	281.8	−19.0	339	-------	2	
		5869	−62.0	281.8	+25.0	291	-------	2	
		5867	−59.0	284.8	−27.5	485	-------	11	
		5865	−12.0	331.8	−19.0	73	-------	4	
		5863	−1.0	342.8	−9.0	97	-------	12	
		5862	−0.5	343.3	+9.0	194	-------	7	
		5864	+2.0	345.8	+13.0	388	-------	20	
		5866	+19.0	2.8	+24.0	97	-------	9	
		5853	+66.0	49.8	−15.0	24	-------	1	
		5853	+80.0	63.8	−13.0	291	2811	2	
Apr. 29	11 13	5872	−67.0	263.4	−22.0	194	-------	8	Do.
		5871	−62.0	268.4	+25.0	291	-------	4	
		5870	−59.5	270.9	−30.0	61	-------	2	
		5867	−54.0	276.4	−25.0	16	-------	2	
		5868	−48.0	282.4	−20.0	291	-------	4	
		5869	−47.5	282.9	+25.0	242	-------	2	
		5867	−45.0	285.4	−27.5	388	-------	8	
		5865	+1.0	331.4	−19.5	61	-------	3	
		5862	+12.5	342.9	+9.5	194	-------	2	
		5863	+15.0	345.4	−10.0	48	-------	4	
		5864	+16.5	346.9	+13.0	388	2174	12	
Apr. 30	15 33	5872	−59.0	255.8	−22.5	24	-------	2	Do.
		5872	−50.0	264.8	−22.0	194	-------	7	
		5871	−47.0	267.8	+25.0	194	-------	4	
		5870	−44.0	270.8	−30.0	61	-------	4	
		5867	−38.0	276.8	−25.0	16	-------	1	
		5869	−33.0	281.8	+24.5	339	-------	3	
		5868	−32.0	282.8	−20.0	170	-------	12	
		5867	−29.5	285.3	−28.0	291	-------	8	
		5865	+17.0	331.8	−19.0	61	-------	1	
		5862	+29.0	343.8	+9.5	194	-------	1	
		5864	+31.0	315.8	+13.0	291	1835	13	

Mean daily area for 29 days=2221.

PROVISIONAL SUNSPOT RELATIVE NUMBERS FOR APRIL 1938

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

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

April 1938	Relative numbers	April 1938	Relative numbers	April 1938	Relative numbers
1	83	11	*a* 110	21	*b* 89
2	*ad* 81	12	97	22	*a* 75
3	80	13	*Mc* 119	23	*Ecddd* 82
4	80	14	*b* 115	24	*a* 95
5	*d* 93	15	*d* 117	25	*Ec* 92
6	*a* 97	16	*aad* 133	26	*d* 92
7	*d* 97	17	110	27	*dd* 124
8	*a* 88	18	112	28	*ad* 144
9	*d* 88	19	100	29	144
10	*d* 106	20	99	30	105 ?

Mean: 30 days=101.6.

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.