SOLAR RADIATION AND SUNSPOT DATA FOR APRIL 1945

[Solar Radiation Investigations Section, I. F. Hand, in charge]

SOLAR RADIATION OBSERVATIONS

Explanations of the tables and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the January 1944 REVIEW, page 43. A list of the pyrheliometric stations also is given on page 45 of the same REVIEW.

Morning fogs at Blue Hill resulted in lower values of total solar and sky radiation then received in the heart of Boston.

TABLE 1.—*Solar radiation intensities during April 1945*

[GRAM-CALORIES PER MINUTE PER SQUARE CENTIMETER OF NORMAL SURFACE]

MADISON, WIS.

Date	Sun's zenith distance										
	7:30 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	1:30 p. m.
	75th mer. time	Air mass									75th mer. time
		A. M.				*1.0	P. M.				
	e.	5.0	4.0	3.0	2.0		2.0	3.0	4.0	5.0	e.
	mb.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mb.*
Apr. 5	3.5	0.71	0.83	0.96	1.22	1.50					3.7
Apr. 7	6.6	.53	.65	.77	.98	1.23					8.6
Apr. 9	10.5	.35	.47	.59	.86						13.7
Apr. 10	12.3	.43	.57	.71							14.8
Apr. 12	7.4	.75	.83	.96	1.15	1.40					8.5
Apr. 17	5.1										5.3
Apr. 18	4.2	.61	.84	.91							3.8
Apr. 20	7.2	.45	.59	.70							7.4
Apr. 27	4.6	.65	.77	.88	1.08	1.38					6.4
Means		.56	.69	.81	1.04	1.38					
Departures		−.15	−.17	−.20	−.14	−.04					

LINCOLN, NEBR.

Apr. 1	8.4					1.34					9.1
Apr. 4	4.4				1.11						4.0
Apr. 5	2.3		0.98	1.11	1.27	1.45					4.6
Apr. 6	6.6		.83	1.01	1.18	1.41					7.4
Apr. 11	8.1					1.44	1.25	1.09	0.96		6.1
Apr. 18	4.2			.79	1.09	1.35	1.09				6.4
Apr. 20	7.2				1.01	1.37					11.8
Apr. 21	6.9				1.09	1.25	1.07	.88	.71	0.60	7.2
Apr. 26	6.6					1.35	1.11				10.6
Apr. 30	7.8				1.07	1.32					7.4
Means			(.90)	.97	1.11	1.36	1.13	(.98)	(.84)	(.60)	
Departures			+.07	−.01	−.07	−.10	−.04	+.02	+.02	−.10	

ALBUQUERQUE, N. MEX.

Apr. 1	4.2		1.06	1.14	1.28	1.48		1.41	1.35	1.31	3.6
Apr. 4	1.8				1.36	1.55					0.0
Apr. 5	1.2			1.19	1.32	1.48					1.7
Apr. 6	1.1		1.10	1.19	1.31	1.48	1.43				1.4
Apr. 7	1.9			1.08	1.25	1.49	1.35	1.34	1.34	1.33	2.6
Apr. 9	1.9				1.37	1.51		1.07			1.9
Apr. 10	3.3			1.19	1.33						1.9
Apr. 11	2.9				1.29	1.52	1.41				2.5
Apr. 12	2.6			1.11	1.28			1.25	1.19	1.17	3.0

TABLE 1.—*Solar radiation intensities during April 1945*—Continued

ALBUQUERQUE, N. MEX.—Continued

Date	Sun's zenith distance										
	7:30 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	1:30 p. m.
	75th mer. time	Air mass									75th mer. time
		A. M.				*1.0	P. M.				
	e.	5.0	4.0	3.0	2.0		2.0	3.0	4.0	5.0	e.
	mb.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mb.*
Apr. 13	3.6	0.96	1.03	1.08	1.26				1.18	1.14	3.8
Apr. 14	3.4		.90	.98	1.08						4.6
Apr. 16	3.3	.78	.85	1.04	1.24						4.6
Apr. 17	3.0	.86	.99	1.09	1.30	1.47	1.35				3.2
Apr. 18	3.4					1.48	1.27	1.04			3.4
Apr. 19	5.6	.82	.92	1.07	1.24		1.26	1.14	1.07	.99	6.0
Apr. 20	4.2	.94	1.02	1.13	1.28	1.44	1.29	1.20	1.15	1.08	6.0
Apr. 21	5.8			.63	1.00						6.3
Apr. 22	5.6					1.46					5.2
Apr. 24	5.6		.86								4.6
Apr. 25	4.2					1.49					2.6
Apr. 27	5.2		.89	1.02	1.18	1.43					4.6
Apr. 28	4.0	.90	.98	1.09	1.25	1.45	1.39	1.33	1.27	1.25	3.8
Apr. 29	3.3				1.03	1.49	1.41	1.35	1.34	1.35	3.6
Apr. 30	3.2	1.28	1.30	1.32	1.34	1.48	1.06				4.4
Means		.95	.99	1.08	1.25	1.48	1.32	1.25	1.24	1.20	
Departures		+.05	.00	−.02	−.02	−.01	+.03	+.10	+.17	+.21	

BLUE HILL, MASS.

Apr. 1	7.8	0.77	0.86	1.03	1.22	1.48	1.20	1.00			6.1
Apr. 5	15.2								0.90		6.9
Apr. 6	2.6	.90	1.01	1.14	1.33	1.53	1.29	1.11	.97	0.87	2.7
Apr. 7	4.6	.78	.88	1.04	1.20	1.43		.99	.84	.72	5.1
Apr. 8	8.1	.66	.80	.97	1.14	1.39	1.10	.92		.67	9.8
Apr. 9	10.6	.67	.79	.95	1.16		1.18	1.00	.85	.75	9.1
Apr. 10	9.8					1.45		1.03			11.8
Apr. 11	12.5					1.47	1.20	.96	.84	.74	9.4
Apr. 13	15.9				.94			.62	.44		11.8
Apr. 18	8.7						1.21	1.06	.92	.80	5.6
Apr. 19	4.8	.73	.84	.95			1.05	.85	.71	.60	4.4
Apr. 21	8.7	.56	.67	.82							4.6
Apr. 22	4.8				1.17			1.02	.90	.82	3.3
Apr. 23	2.4	.88	.99	1.11	1.27	1.46		1.05	.90	.82	2.5
Apr. 24	3.5	.78									4.0
Means		.75	.86	1.00	1.18	1.46	1.18	.97	.83	.75	
Departures		−.04	−.03	−.03	.00	+.07	+.05	+.02	+.01	+.07	

BOSTON, MASS.

Apr. 6	2.9			1.08	1.27	1.48					3.3
Apr. 7	4.6			.85	1.08						6.4
Apr. 9	10.2	0.39	0.64	.76	.99	1.46					12.7
Apr. 12	14.2				1.08	1.37					15.8
Apr. 13	15.8				.90						15.8
Apr. 19	6.1				1.16						5.3
Apr. 21	9.1				.94						8.7
Apr. 23	3.0	.85	.90	1.02	1.16	1.46					2.9
Means		(.62)	(.77)	.93	1.07	1.44					

RATIO BOSTON/BLUE HILL, ON COMPARABLE DATES

		(0.79)	(0.87)	0.88	0.92	0.98					

* Extrapolated.

TABLE 2.—*Daily totals and weekly means of solar radiation (direct+diffuse) received on a horizontal surface*

[Gram-calories per square centimeter]

Date	Washington, D.C.	Madison, Wis.	Lincoln, Nebr.	East Lansing, Mich.	New York, N.Y.	Fresno, Calif.	Fairbanks, Alaska	Columbia, Mo.	Boston, Mass.	Nashville, Tenn.	Twin Falls, Idaho	La Jolla, Calif.	Riverside, Calif.	Blue Hill, Mass.	Portland, Maine[1]	Ithaca, N.Y.	Newport, R.I.	State College, Pa.	Put-in-Bay, Ohio	East Wareham, Mass.	Davis, Calif.	Boulder, Colo.	Tooele, Utah
1945	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Apr. 2	109	425	73	59	167	624	------	209	147	155	428	318	564	110	188	94	124	100	256	101	654	116	566
Apr. 3	558	98	92	91	520	599	------	368	234	551	459	592	654	265	304	87	438	480	184	331	651	100	580
Apr. 4	332	179	616	155	106	604	------	149	133	43	527	584	633	104	138	178	150	201	191	132	618	622	742
Apr. 5	462	643	605	335	304	534	------	558	178	610	530	593	634	137	225	296	116	384	327	114	651	645	730
Apr. 6	563	482	560	472	590	518	------	641	611	584	449	572	607	626	640	457	581	611	580	597	512	630	666
Apr. 7	598	568	374	483	508	491	------	637	569	598	362	574	603	578	582	531	570	622	585	584	393	574	594
Apr. 8	579	552	519	491	454	116	------	565	555	580	122	454	508	556	504	535	559	599	539	577	399	432	322
Means	457	421	406	298	378	498	389	433	347	446	411	527	601	339	369	311	362	428	380	348	554	446	600
Departures	+81	+46	+14	−37	+27	0	+54	+11	−28	+36	−24	+23	+140	−55	------	+29	−53	+42	0	−59	+5	------	------
Apr. 9	572	508	480	470	548	592	------	544	584	515	531	462	418	564	570	546	569	608	566	586	674	494	288
Apr. 10	583	533	126	478	531	606	------	556	490	549	564	569	635	507	435	552	484	592	578	514	639	122	553
Apr. 11	303	298	513	419	232	632	------	216	534	550	234	565	637	539	539	581	466	612	533	513	592	545	433
Apr. 12	297	639	372	284	274	677	------	449	526	563	265	541	566	524	564	486	483	576	233	541	679	419	586
Apr. 13	525	211	109	274	458	649	------	477	465	390	252	598	612	515	522	418	527	509	332	506	698	170	450
Apr. 14	365	619	148	388	321	633	------	59	500	403	611	607	653	500	507	168	439	178	196	530	693	62	785
Apr. 15	71	145	44	324	548	636	------	58	603	392	611	609	650	592	647	590	584	560	344	629	657	40	267
Means	388	422	256	376	416	629	381	337	529	480	438	564	596	534	541	477	508	519	398	545	662	265	480
Departures	−9	+20	−162	+15	+61	+83	+14	−41	+142	+69	−11	+41	+148	+160	------	+175	+87	+126	+1	+130	+90	------	------
Apr. 16	61	293	207	216	104	621	------	225	321	150	601	596	644	248	------	187	194	76	315	262	681	238	756
Apr. 17	80	604	548	382	201	620	------	610	358	612	604	372	617	228	------	224	167	294	604	276	661	652	781
Apr. 18	635	526	644	331	607	604	------	657	593	606	508	218	580	593	------	374	575	513	474	568	662	630	706
Apr. 19	646	373	568	489	569	603	------	201	605	625	591	162	574	513	------	437	540	598	626	622	666	554	739
Apr. 20	266	353	557	328	193	586	------	614	474	386	431	146	545	275	------	75	413	210	412	500	633	662	673
Apr. 21	282	527	602	203	192	615	------	649	413	525	477	162	476	453	------	112	439	252	301	508	596	618	504
Apr. 22	664	334	497	565	666	623	------	517	593	211	626	318	186	490	------	------	535	713	694	656	715	253	782
Means	376	430	518	359	362	610	428	496	480	445	548	282	518	400	------	235	409	380	489	485	659	515	706
Departures	−34	+27	+79	+3	−21	+30	+51	+160	+109	+37	+70	−243	+13	+22	------	−55	+7	−22	+93	+76	+81	------	------
Apr. 23	434	297	165	450	540	597	------	281	654	197	233	583	618	659	------	557	655	563	388	675	593	531	633
Apr. 24	116	140	573	38	361	601	------	72	409	387	361	284	223	377	------	77	469	84	105	506	585	279	145
Apr. 25	118	303	108	94	40	659	------	48	128	508	456	183	193	118	------	107	166	151	149	250	647	492	689
Apr. 26	492	279	637	106	513	669	------	641	163	171	632	544	315	125	------	270	367	346	57	219	718	492	603
Apr. 27	612	709	250	337	328	658	------	475	99	507	571	624	667	91	------	80	153	186	275	116	690	545	751
Apr. 28	529	534	348	592	654	648	------	109	331	99	641	507	652	311	------	133	521	682	643	376	701	536	700
Apr. 29	481	595	148	573	438	649	------	609	334	262	632	356	648	300	------	265	532	313	585	454	722	572	781
Means	398	408	318	313	410	640	295	319	303	304	504	440	474	283	------	213	409	332	315	371	665	492	615
Departures	−49	−26	−103	−25	−42	+76	−67	−23	−75	−120	+3	−88	+7	−157	------	−181	−56	−108	−72	−66	+76	------	------
ACCUMULATED DEPARTURES ON APRIL 29, 1945																							
	+175	+3,129	−2,793	−1,274	0	+1,337	−511	+854	+2,163	−2,149	−2,275	−4,053	+4,200	−1,232	------	+287	−1,470	+3,395	+1,148	+546	+1,176	------	------

[1] NOTE.—Data for Portland, Maine, discontinued Apr. 15, 1945.

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR APRIL 1945

By LUCY T. DAY

[Equatorial Division, U. S. Naval Observatory]

[Communicated by Commodore J. F. Hellweg, U. S. N. (Ret.) Superintendent, U. S. Naval Observatory.] All measurements and spot counts were made at the Naval Observatory from plates taken at the observatories indicated. Difference in longitude is measured from the central meridian, positive toward the west. Latitude is positive toward the north. Areas are corrected for foreshortening and expressed in millionths of Sun's hemisphere. For each day, under longitude, latitude, areas of spot or group, and spot count are included assumed longitude of center of the disk, assumed latitude of center of the disk, total area of spots and groups and total spot count.

Date	Eastern standard time	Mount Wilson group No.	Heliographic: Difference in longitude	Heliographic: Longitude	Heliographic: Latitude	Heliographic: Distance from center of disk	Area of spot or group	Spot count	Plate quality	Observatory
1945	*h m*		°	°	°	°				
April 1	10 39	7735	−85	346	−28	85	48	1	P	U. S. Naval.
		7734	−12	59	+32	40	48	1		
		7733	+1	72	−21	16	436	6		
		7733	+8	79	−22	17	485	11		
		7732	+51	122	−33	55	48	3		
		7732	+56	127	−31	60	339	1		
				(71)	(−7)		1,404	23		

See footnotes at end of table.

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR APRIL 1945—Continued

Date	Eastern standard time	Mount Wilson group No.	Heliographic: Difference in longitude	Heliographic: Longitude	Heliographic: Latitude	Heliographic: Distance from center of disk	Area of spot or group	Spot count	Plate quality	Observatory
1945	*h m*		°	°	°	°				
2	11 16	7735	−72	346	−27	72	48	1	F	Mt. Wilson.
		7734	+2	60	+33	40	73	1		
		7733	+15	73	−22	22	388	5		
		7733	+21	79	−22	26	533	6		
		7732	+70	128	−31	70	145	1		
				(58)	(−6)		1,187	14		
3	10 26	7735	−60	345	−28	62	97	1	G	U. S. Naval.
		7734	+13	58	+34	42	48	2		
		7733	+26	71	−21	29	291	5		
		7733	+31	76	−21	33	242	10		
		7733	+35	80	−22	37	339	1		
		7732	+80	125	−31	80	291	1		
				(45)	(−6)		1,308	20		
4	11 16	7735	−48	343	−28	52	97	2	P	Do.
		7734	+27	58	+34	50	48	1		
		7733	+40	71	−21	42	291	4		
		7733	+44	75	−21	47	194	12		
		7733	+48	79	−22	49	242	1		
				(31)	(−6)		872	20		

See footnotes at end of table.