SOLAR RADIATION AND SUNSPOT DATA FOR MAY 1942

[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 1942 REVIEW, p. 20.

Beginning with this issue, total solar and sky radiation data from Put-in-Bay, Ohio, regularly will appear in table 2 through a cooperative arrangement between this Bureau and Dr. Thomas H. Langlois, Director of the Franz Theodore Stone Biological Laboratory, and Prof. David C. Chandler of the same institution who has immediate supervision of the pyrheliometric equipment. The coordinates of the laboratory are as follows: latitude 41°39′51″N. longitude 82°49′30″W. altitude 618 feet (188.4 meters).

Put-in-Bay is on an island about 5 miles wide and 10 miles long in Lake Erie, 20 miles north of Sandusky, Ohio. Ohio State University is making intensive biological studies of the vegetable and animal organisms in this, the shallowest of the Great Lakes. This university finds that solar radiation which penetrates through the water is of great significance in this study.

TABLE 1—*Solar radiation intensites during May 1942.*

[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									Local mean solar time
		A. M.					P. M.				
	e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
May 7	5.56	------	------	------	------	------	------	------	------	------	5.79
May 8	6.27	0.64	0.75	0.88	1.06	1.24	------	------	------	------	6.50
May 16	5.56	.84	1.01	1.11	1.33	1.55	------	------	------	------	7.29
May 19	6.50	------	------	------	------	------	------	------	------	------	6.76
Means	------	(.74)	(.88)	(1.00)	(1.20)	(1.40)	------	------	------	------	------
Departures	------	(+.13)	(+.10)	(+.03)	(.+09)	(+.03)	------	------	------	------	------

LINCOLN, NEBR.

May 7	4.57	------	------	------	------	------	1.19	------	------	------	6.50
May 8	6.27	------	------	------	------	1.40	.94	0.79	0.66	0.54	8.81
May 9	8.18	------	------	------	------	------	.97	------	------	------	11.38
May 15	4.95	------	------	------	------	1.41	1.10	.92	.77	.67	6.02

TABLE 1—*Solar radiation intensites during May 1942*—Continued

[Gram-calories per square centimeter of normal surface]

LINCOLN, NEBR.—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									Local mean solar time
		A. M.					P. M.				
	e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
May 30	17.37	------	------	------	------	1.28	.94	.73	.58	.45	16.79
Means	------	------	------	------	------	1.36	1.03	.81	.67	.55	------
Departures	------	------	------	------	------	−.02	−.10	−.09	−.13	−.11	------

ALBUQUERQUE, N. MEX.

	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
May 2	3.45	------	------	------	------	------	1.34	1.17	1.05	0.94	3.15
May 3	4.17	1.03	1.12	1.22	1.36	1.57	1.36	1.23	1.11	1.01	3.81
May 4	3.99	1.03	1.12	1.21	1.39	------	------	------	------	------	4.37
May 5	3.00	.86	.98	1.12	1.28	------	1.30	1.16	1.07	.96	2.49
May 6	3.45	------	------	------	------	1.42	1.11	------	------	------	3.99
May 7	4.57	------	------	------	------	1.41	1.17	.95	.82	.68	4.75
May 8	5.56	.73	.86	1.00	1.18	1.48	1.17	.97	.83	------	5.56
May 9	4.17	.89	.98	1.10	1.26	1.45	------	------	------	------	4.17
May 10	4.17	.78	.90	1.03	1.22	1.46	1.20	------	------	------	4.75
May 11	2.87	.90	1.01	1.17	1.28	1.50	1.26	------	------	------	3.30
May 12	3.63	.86	.97	1.10	1.26	1.49	------	------	------	------	4.17
May 13	2.06	.92	1.01	1.12	1.29	1.47	------	------	------	------	2.74
May 14	3.63	.86	.96	1.11	1.28	1.48	1.30	1.16	1.04	.94	3.15
May 15	3.45	.92	1.03	1.13	1.27	------	------	------	------	------	3.99
May 16	3.45	.86	.94	1.07	1.24	1.42	1.18	1.07	.92	.81	4.75
May 17	2.74	.85	.96	1.11	1.28	1.52	1.31	------	------	------	3.45
May 19	4.57	------	------	1.06	1.22	1.45	------	------	------	------	3.45
May 20	6.50	.56	.64	.78	.93	1.25	1.02	.89	.73	.65	6.02
May 21	7.57	.57	.67	.84	1.05	1.35	1.06	------	------	------	9.47
May 24	6.50	.83	.90	------	1.18	1.49	1.27	1.10	------	------	7.29
May 26	3.99	.89	.98	1.15	1.32	------	------	------	------	------	4.37
May 27	3.30	.89	.99	1.14	1.30	1.53	1.34	1.22	1.10	1.00	4.95
May 28	4.17	.98	1.06	1.17	1.28	1.51	------	------	------	------	5.36
May 29	3.81	------	------	------	1.34	1.49	1.30	1.23	1.03	.94	5.16
May 30	3.45	1.00	1.08	1.17	1.34	1.55	1.30	1.14	1.04	.99	4.95
May 31	3.15	1.02	1.10	1.18	1.35	1.53	1.32	1.16	1.06	.98	3.63
Means	------	.87	.96	1.09	1.26	1.47	1.24	1.12	.98	.90	------

BLUE HILL, MASS.

May 1	7.1	------	------	------	------	1.26	------	------	------	------	6.3
May 2	8.0	0.45	0.57	0.68	------	1.13	------	------	------	------	6.3
May 5	7.7	.60	.68	.90	------	1.25	0.98	0.88	0.77	0.69	6.9
May 6	7.4	------	------	------	1.05	1.23	------	------	------	------	6.3
May 8	9.0	------	------	------	------	------	------	------	------	.27	9.7
May 10	11.3	------	------	------	------	------	------	.86	.79	.68	7.7
May 11	5.8	.77	.86	.99	1.15	1.28	1.04	.89	.70	.60	6.3
May 12	9.4	.47	.56	.69	------	------	------	------	------	------	7.7
May 29	11.7	------	------	------	------	1.06	.58	.41	.28	------	14.1
May 30	18.2	.17	.25	.35	------	------	------	------	------	------	18.2
Means	------	.49	.58	.72	1.10	1.20	.87	.76	.64	.56	------
Departures	------	−.16	−.24	−.28	−.01	−.16	−.21	−.12	−.11	−.10	------

*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	Madison	Lincoln	Chicago	New York	Fresno	Fairbanks	Cambridge	Nashville	Twin Falls	New Orleans	Riverside	Blue Hill	Friday Harbor	Ithaca	Newport	State College	Put-in-Bay	San Juan u. v. below 3132 Å
	cal.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*milli-cal.*
Apr. 30	546	514	226	546	535	371	--------	582	504	576	256	671	590	206	597	555	588	542	332
May 1	577	340	217	389	421	550	--------	532	483	269	642	468	538	559	493	565	519	427	303
May 2	465	380	65	634	378	696	--------	614	571	668	534	698	616	542	318	655	429	591	414
May 3	565	218	340	310	403	681	--------	475	414	332	390	667	473	598	343	520	454	314	155
May 4	325	368	280	303	297	723	--------	367	316	189	423	663	403	617	445	381	444	254	363
May 5	680	182	63	444	653	689	--------	672	692	677	120	634	684	574	310	703	738	640	149
May 6	491	30	158	178	463	691	--------	614	360	669	548	457	622	595	253	637	341	176	138
Mean	**521**	**290**	**193**	**401**	**450**	**628**	**472**	**551**	**477**	**483**	**416**	**608**	**561**	**527**	**394**	**574**	**502**	**420**	**287**
Departure	+45	−152	−264	−6	−5	+11	+60	+118	--------	−39	+14	+81	+82	+1	−14	+83	−34	--------	--------
May 7	263	630	635	260	80	680	--------	56	334	548	208	498	58	514	246	71	360	62	412
May 8	431	676	618	618	351	666	--------	254	350	616	316	663	328	376	186	461	115	636	319
May 9	521	330	596	184	62	709	--------	309	642	447	692	620	279	520	624	356	598	618	132
May 10	383	685	187	537	634	644	--------	460	459	470	618	406	450	228	740	486	775	746	357
May 11	652	53	373	222	684	589	--------	663	567	285	707	550	710	221	700	743	719	268	193
May 12	556	199	549	259	535	684	--------	347	583	307	122	686	337	362	233	320	459	380	245
May 13	624	433	600	521	594	715	--------	536	602	512	300	669	472	210	486	592	650	621	323
Mean	**494**	**429**	**508**	**372**	**420**	**670**	**503**	**375**	**505**	**455**	**423**	**584**	**376**	**347**	**459**	**432**	**525**	**476**	**286**
Departure	+30	−25	+54	−57	−26	+32	+42	−54	--------	−121	−14	+40	−107	−185	−4	−69	+29	--------	--------
May 14	462	208	625	650	610	349	--------	125	346	405	378	665	309	492	655	494	585	348	392
May 15	542	68	692	48	507	551	--------	408	324	204	489	653	396	726	442	490	308	56	301
May 16	79	623	519	600	175	723	--------	456	698	724	731	637	487	673	235	451	307	125	198
Max 17	625	430	534	530	457	725	--------	205	726	742	691	671	242	560	229	262	458	547	288
May 18	655	348	696	366	682	720	--------	103	277	519	549	649	127	696	640	254	761	265	--------
May 19	354	685	244	579	234	685	--------	309	465	678	529	629	314	306	238	510	350	667	66
May 20	317	343	580	368	349	678	--------	313	74	681	669	634	311	637	68	452	94	105	262
Mean	**433**	**386**	**556**	**449**	**431**	**633**	**449**	**274**	**416**	**565**	**577**	**648**	**312**	**584**	**358**	**416**	**409**	**302**	**275**
Departure	−43	−90	+43	+8	−38	−19	+2	−136	--------	−43	+127	+124	−195	+47	−108	−78	−63	--------	--------
May 21	417	414	224	609	184	701	--------	98	536	684	--------	559	109	423	121	312	113	659	345
May 22	245	723	278	657	323	734	--------	170	506	433	734	488	181	543	208	245	188	152	417
May 23	578	544	496	548	267	695	--------	240	431	316	593	611	214	415	446	411	464	574	443
May 24	--------	630	706	641	540	625	--------	429	547	481	286	456	370	486	414	529	543	265	298
May 25	540	664	337	601	525	412	--------	524	610	323	478	560	460	324	324	590	202	650	450
May 26	622	253	621	144	656	763	--------	525	286	370	713	656	514	722	666	692	587	466	402
May 27	448	411	549	425	508	744	--------	481	619	418	619	665	461	521	317	435	444	621	370
Mean	**475**	**520**	**459**	**518**	**429**	**668**	**547**	**352**	**505**	**432**	**570**	**571**	**330**	**491**	**357**	**459**	**363**	**484**	**394**
Departure	−25	+21	−83	+41	−48	+6	+89	−35	--------	−193	+133	+32	−133	−88	−143	−28	−95	--------	--------
May 28	632	258	634	481	670	648	--------	636	550	624	682	683	671	485	796	672	751	632	370
May 29	624	460	668	697	578	750	--------	650	557	377	281	653	645	573	596	701	699	524	117
May 30	568	558	599	713	521	724	--------	520	658	689	533	643	502	338	439	606	440	513	340
May 31	506	198	315	511	494	730	--------	445	646	697	637	676	393	353	500	474	597	428	326
June 1	132	212	513	578	107	717	--------	592	642	672	613	625	609	626	152	517	100	572	76
June 2	194	358	495	464	135	742	--------	243	515	548	666	562	254	650	239	177	164	388	140
June 3	317	514	625	388	227	733	--------	82	590	544	195	526	107	342	332	136	449	606	62
Mean	**425**	**365**	**550**	**547**	**390**	**721**	**559**	**452**	**594**	**593**	**515**	**624**	**454**	**481**	**436**	**469**	**457**	**523**	**222**
Departure	−83	−126	+30	+63	−117	+43	+86	+23	--------	−1	+47	+78	−85	−69	−55	−59	−23	--------	--------
	−532	**−2,604**	**−1,540**	**+343**	**−1,638**	**+511**	**+1,953**	**−588**	--------	**−2,779**	**+2,149**	**+2,485**	**−3,066**	**−2,058**	**−2,268**	**−1,057**	**−1,302**	--------	--------
ACCUMULATED DEPARTURES ON JUNE 3																			
	+2,338	**−3,108**	**−3,899**	**+3,101**	**−105**	**+371**	**+1,092**	**−679**	--------	**−1,890**	**+8,078**	**+5,803**	**−3,948**	**−196**	**−1,365**	**−1,554**	--------	--------	--------

POSITIONS, AREAS, AND COUNTS OF SUN SPOTS FOR MAY 1942

Communicated by Capt. 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, area 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
1942	*h m*		°	°	°	°				
May 1	11 27	7429	−57	43	−9	57	242	1	F	U. S. Naval.
		(*)	−17	83	−6	17	24	2		
		7428	+12	112	+14	22	48	3		
		7423	+16	116	+9	21	48	5		
		7423	+20	120	+9	23	12	4		
		7430	+34	134	−22	36	12	1		
		7426	+73	173	−13	73	24	1		
				(100)	(−4)		410	17		
2	10 8	7429	−43	45	−9	43	134	1	F	Do.
		7423	+30	118	+9	32	97	12		
				(88)	(−4)		290	13		

POSITIONS, AREAS, AND COUNTS OF SUN SPOTS FOR MAY 1942—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
1942	*h m*		°	°	°	°				
3	8 50	7429	−30	45	−10	31	145	1	VG	Mt. Wilson.
		7423	+44	119	+8	46	170	18		
				(75)	(−4)		315	19		
4	11 13	7429	−16	45	−10	17	97	4	G	U. S. Naval.
		7423	+58	119	+8	60	291	17		
				(61)	(−4)		388	21		
5	10 40	7429	−11	37	−12	13	12	2	F	Do.
		7429	−4	44	−10	6	97	7		
		7423	+70	118	+8	71	48	4		
		7423	+76	124	+8	77	291	3		
				(48)	(−4)		448	16		
6	10 33	(*)	+3	38	−13	10	12	5	G	Do.
		7429	+9	44	−10	11	73	7		
				(35)	(−4)		85	12		