SOLAR RADIATION AND SUNSPOT DATA FOR DECEMBER 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, page 20.

Early in November 1942, the total solar and sky radiation equipment at the Weather Bureau office at Fairbanks, Alaska, was transferred to the University of Alaska at College, Alaska, 4 miles west of Fairbanks.

TABLE 1.—*Solar radiation intensities during December 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.*
Dec. 1	2.49			1.11		1.60		1.10			2.03
13	.81	0.62	0.74	.88							1.30
Means		(.62)	(.74)	(1.00)		(1.60)		(1.10)			
Departures		−.35	−.35	−.22		.00		−.11			

LINCOLN, NEBR.

Dec. 2	0.69	0.98	1.09	1.24							1.02
3	1.30	.83	.98	1.13				1.22	1.11	0.98	1.68
16	2.62			1.16							2.06
17	4.37	1.01	1.09	1.22				1.11	.94	.79	5.59
22	3.15	.92	1.04	1.16							3.99
Means		.94	1.05	1.18				(1.16)	(1.02)	(.88)	
Departures		−.02	−.05	−.06				−.03	−.04	−.07	

BLUE HILL, MASS.

Dec. 4	2.1	0.70	0.82	0.98							2.2
6	3.0			.90	1.07				0.75	0.67	3.2
7	3.3		1.01	1.15							2.7
8	3.2	1.01	1.06					1.26	1.11	.99	2.2
14	1.3								1.18	1.08	1.6
17	.4	1.10	1.20	1.33							1.1
19	1.1	1.08	1.17	1.28							1.2
25	5.3			.66				.78	.56	.48	4.8
26	3.3			1.21				1.03	.86	.68	3.0
31	3.5							1.10	1.01	.91	3.8
Means		.97	1.05	1.07	(1.07)			1.04	.91	.80	
Departures		−.06	+.01	−.11	−.27			−.11	−.13	−.18	

ALBUQUERQUE, N. MEX.

Dec. 1	2.74	1.09	1.18	1.30	1.45		1.44	1.30	1.19	1.09	2.62
2	2.87			1.30							3.00
10	2.87	1.07	1.16								3.00
12	3.15				1.44		1.45				3.45
13	3.15			1.30	1.43		1.45	1.31	1.19	1.10	3.30
15	2.62				1.43		1.41				3.00
16	2.74	1.11	1.18	1.25							3.30
24	3.99							1.25	1.12	1.03	4.57
27	2.62	1.05	1.10	1.32	1.48		1.45	1.30	1.17	1.07	3.15
28	3.00	1.13	1.21	1.32	1.46		1.46				3.15
29	3.30	1.07	1.16	1.29	1.42		1.38	1.28	1.12		4.17

*Extrapolated.

TABLE 1.—*Solar radiation intensities during December 1942*—Con.

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									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.*
Dec. 30	3.45							1.28	1.16	1.05	4.17
31	3.30	1.03	1.16	1.22	1.41		1.39	1.27	1.16	1.06	4.37
Means		1.08	1.16	1.29	1.44		1.43	1.28	1.16	1.07	
Departures		+.01	−.01	−.01	+.01		−.01	.00	.00	+.01	

LATE DATA

TABLE 1.—*Solar radiation intensities during October and November 1942*

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

BLUE HILL, MASS.

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.*
Oct. 1	9.4	0.71	0.83	0.96				0.70	0.56	0.27	9.0
2	6.6	.82	.98				1.24	1.09	.96	.85	10.1
3	7.4						1.26	1.09	1.00	.89	9.4
4	7.4		1.00	1.16	1.31						8.0
7	8.4				1.24			.90	.73	.61	9.0
8	8.4	.93	1.04	1.16	1.29	1.37	1.20	1.03	.95	.86	8.4
10	10.9	.45	.60	.77	1.04	1.36					10.1
12	9.0	.86		1.12							8.7
13	9.4					1.41	1.32	1.14	1.02		9.4
19	8.0	.90	1.01	1.18							6.6
21	10.5				1.06						9.4
27	5.6		.99	1.10					.87	.89	3.8
28	4.6	.83	.96	1.08			1.19		.83	.70	5.1
30	10.5							1.04	.94	.83	11.7
31	14.6							.96	.84	.75	12.6
Means		.79	.93	1.07	1.37	1.38	1.24	.99	.87	.74	
Departures		−.10	−.04	−.02	+.13	.00	+.03	−.04	−.05	−.06	
Nov. 2	6.3			1.17	1.31		1.26	1.04	.88	.74	4.8
4	4.0	1.03	1.13	1.26			1.42	1.27	1.15	1.06	3.0
5	5.8	1.03	1.13	1.25							5.8
9	5.6	.96	1.06	1.20							4.0
11	5.1	.93	1.04	1.17							4.6
14	2.0	.89	.99	1.11					.93	.82	2.6
15	1.9	1.10	1.19	1.29				1.23	1.12	1.00	1.8
17	5.1	.61	.74								7.4
18	11.8									.76	11.8
19	6.3	.98	1.10	1.24							4.4
23	2.6	1.06	1.16	1.25							3.0
Means		.95	1.06	1.22	(1.31)		(1.34)	1.18	1.02	.88	
Departures		+.04	+.05	+.09	+.04		+.09	+.08	+.06	−.04	

*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	East Lansing	Cambridge	Fairbanks‡	Nashville	Twin Falls	New Orleans	Riverside	Blue Hill	Ithaca	Newport	State College	Put-in-Bay	East Wareham	Davis, Calif.
	cal.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*		
Dec. 3	277	155	244	129	199	------	145	------	24	198	247	72	139	181	210	222	203	181	221
4	270	116	206	198	186	------	187	------	171	145	198	87	197	121	209	129	107	210	222
5	112	80	75	68	174	------	144	------	44	228	197	264	168	19	180	144	119	173	237
6	108	155	185	189	181	------	160	------	33	67	109	287	161	124	189	102	145	184	51
7	115	195	92	104	175	------	138	------	20	154	73	288	172	186	211	128	124	179	165
8	234	121	122	146	202	------	209	------	22	93	63	101	220	95	222	230	156	227	149
9	183	84	64	52	38	------	28	------	122	106	275	264	29	47	24	79	106	18	194
Mean	**185**	**129**	**141**	**127**	**165**	------	**145**	**0**	**62**	**142**	**166**	**195**	**155**	**110**	**178**	**148**	**137**	**168**	**177**
Departure	**+23**	**+13**	**−32**	**+47**	**+39**	------	**+4**	**−8**	------	**+20**	**−41**	**−15**	**+17**	**+9**	**+38**	**+30**	------	------	------
10	90	48	199	13	60	------	121	------	66	118	157	271	147	78	123	52	31	108	238
11	80	134	114	76	64	------	85	------	46	183	99	238	79	125	86	112	98	85	158
12	210	137	172	85	117	101	116	------	40	195	289	276	132	180	87	151	86	125	84
13	171	207	87	143	33	263	28	------	82	62	352	250	22	98	20	136	237	44	250
14	199	91	117	55	169	46	209	------	239	44	304	258	220	108	226	109	32	228	252
15	96	90	35	18	63	59	105	------	193	49	337	270	110	36	126	26	32	109	56
16	79	125	204	108	114	204	116	------	226	151	357	268	115	144	121	124	226	99	65
Mean	**132**	**119**	**132**	**71**	**88**	**134**	**112**	**4**	**127**	**115**	**271**	**262**	**118**	**110**	**113**	**101**	**106**	**114**	**158**
Departure	**−7**	**+5**	**−26**	**−11**	**−26**	------	**−9**	**−1**	------	**−5**	**+81**	**+64**	**−14**	**−12**	**−33**	**−8**	------	------	------
17	159	29	199	16	164	45	202	------	196	43	------	182	229	98	224	104	23	232	37
18	132	166	116	98	188	109	217	------	229	30	160	183	220	204	201	82	71	213	58
19	154	116	6	46	210	153	178	------	210	69	306	234	211	116	230	180	200	230	24
20	------	140	47	74	102	232	140	------	55	187	------	257	183	212	126	200	211	134	38
21	265	146	5	176	217	180	204	------	184	171	152	226	233	266	232	168	192	241	114
22	161	98	209	12	85	43	75	------	20	61	171	250	87	42	105	51	24	82	35
23	150	67	173	74	87	67	128	------	74	57	251	170	130	13	145	19	42	143	39
Mean	**170**	**109**	**108**	**71**	**150**	**118**	**163**	**0**	**138**	**88**	**208**	**215**	**185**	**136**	**181**	**115**	**109**	**182**	**49**
Departure	**+24**	**−8**	**−62**	**−18**	**+40**	------	**+36**	**−6**	------	**−25**	**−3**	**−10**	**+51**	**+44**	**+43**	**+19**	------	------	------
24	81	130	90	66	48	72	54	------	113	80	227	54	57	41	93	83	43	76	107
25	144	66	6	29	89	82	147	------	55	112	218	192	143	91	162	77	31	150	268
26	30	22	*0	9	172	18	197	------	139	158	165	301	191	145	199	35	19	192	174
27	49	31	90	14	51	19	88	------	41	74	59	273	104	61	125	10	48	97	156
28	34	27	87	16	19	23	30	------	34	58	------	270	30	55	31	25	14	36	22
29	26	87	63	20	26	41	29	------	32	200	------	261	26	26	21	9	15	39	201
30	48	83	72	18	20	24	16	------	2	32	257	263	9	20	13	17	8	27	115
31	227	30	164	121	234	33	193	------	146	91	196	272	172	91	223	43	23	224	38
Mean [1]	**80**	**59**	**72**	**42**	**94**	**39**	**94**	**0**	**80**	**101**	**187**	**236**	**92**	**66**	**108**	**38**	**29**	**105**	**135**
Departure	**−66**	**−57**	**−88**	**−39**	**−28**	------	**−14**	**−6**	------	**−28**	**+17**	**+33**	**−28**	**−26**	**−24**	**−48**	------	------	------
ACCUMULATED DEPARTURES ON DECEMBER 31, 1942																			
	+109	−3564	−11001	+4504	−3353	------	−5166	+4824	------	+1106	------	+11765	−10934	−607	−5470	------	------	------	------
PERCENTAGE DEPARTURES FOR THE YEAR																			
	+0.1	−3.0	−8.2	+4.3	−2.9	------	−4.4	+6.0	------	+0.8	------	+7.9	−8.8	−0.5	−4.2	------	------	------	------

[1] 8-day mean.

**Lincoln:* Dr. Blair states "the percentage of sunshine for the month of December 1942, was only 28. This is the lowest percentage of any month of our 38-year record, and checks with our very low total solar radiation."

‡*Fairbanks:* Late data values of total solar and sky radiation for November 1942, for the weeks beginning Oct. 29, Nov. 5, Nov. 12, Nov. 19, Nov. 26, are 62, 54, —, —, 12, respectively, and the corresponding departures are +18, +16, —, —, −2. (—, no record; station transferred.)

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR DECEMBER 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*		°	°	°	°				
Dec. 1	10 46	7525	−66	87	−12	66	194	4	G	Mt. Wilson.
		7524	+20	173	−7	22	582	24		
		7519	+26	179	−15	30	16	1		
		7519	+27	180	−12	30	48	1		
		7518	+53	206	+7	54	388	12		
				(153)	(+1)	------	1,228	42		
Dec. 2	11 29	7525	−52	88	−12	54	145	6	G	U. S. Naval.
		7524	+33	173	−7	35	485	19		
		7519	+40	180	−15	43	12	1		
		7519	+40	180	−13	42	48	1		
		7518	+64	204	+8	64	485	14		
				(140)	(+1)	------	1,175	41		

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR DECEMBER 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 count	Spot count	Plate quality	Observatory
1942	*h m*		°	°	°	°				
Dec. 3	10 25	7525	−39	88	−12	41	121	4	F	U. S. Naval.
		7524	+46	173	−8	47	436	12		
		7519	+53	180	−13	55	73	1		
		7518	+77	204	+8	77	436	7		
				(127)	(+1)	------	1,066	24		
Dec. 4	10 35	7525	−28	86	−11	31	48	1	F	Do.
		7525	−26	88	−13	29	48	1		
		7524	+55	169	−7	55	48	3		
		7524	+63	177	−6	63	291	2		
		7519	+66	180	−13	67	97	1		
				(114)	(0)	------	532	8		
Dec. 5	12 35	7527	−64	36	+21	67	97	3	F	Mt. Wilson
		7525	−13	87	−11	18	12	3		
		7525	−11	89	−13	18	48	2		
		7526	−8	92	+13	15	16	2		
		7524	+70	170	−7	70	48	2		
		7524	+79	179	−7	79	242	3		
		7519	+80	180	−13	80	48	1		
				(100)	(0)	------	511	16		