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IMPORTANT NOTICE

Owing to the necessity of drastically reducing the printing cost of the REVIEW to keep within the funds for the fiscal year, now drawing to a close, all "contributions" are omitted in this issue. It may be necessary to follow the same procedure in the next number also. However, it is hoped that "contributions" may be restored beginning with the May REVIEW.—Editor.

BIBLIOGRAPHY

C. FITZHUGH TALMAN, in Charge of Library

RECENT ADDITIONS

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

Ficker, Heinrich von.
Wetter und Wetterentwicklung. Berlin. 1932. 5,139 p. illus. diagrs. 18½ cm.

Fuess, R.
Messinstrumente für Luftdruck, Temperatur und Feuchtigkeit, sowie Prüfgeräte und Thermometerhütten. Berlin. n. d. v. p. illus. 23 cm.
Messinstrumente für Wind, Niederschlag, Verdunstung, Strahlung und Sicht. Berlin. n. d. v. p. illus. 23 cm.

Lindskog, Erik.
On the geographical distribution of fog in Sweden. [Stockholm. 1931.] 94 p. figs. 24½ cm. (Geogr. annaler. H. 1. 1931.)

Lunelund, Harald.
Registrierung der Abkühlungsgrösse in Helsingfors. Helsingfors. n. d. 37 p. 24 cm. (Soc. scient. Fenn. Comment. physico-math. VI. 1.)
Registrierung der Sonnen- und Himmelsstrahlung in Helsingfors während der Zeit 1. Dezember 1928-31. Dezember 1929. Helsingfors. n. d. 56 p. 24 cm. (Soc. scient. Fenn. Comment. physico-math. V. 18.)

Lunelund, Harald—Continued.
Über die Tageshelligkeit in Finnland. Helsingfors. n. d. 34 p. figs. 24 cm. (Soc. scient Fenn. Comment. physico-math. IV. 23.)

Lumelund, Harald, & Holmberg, K. T.
Über die ultraviolette Sonnenstrahlung in Finnland. Helsingfors. n. d. 41 p. figs. 24 cm. (Soc. scient. Fenn. Comment. physico-math. V. 2.)

Negretti & Zambra.
Standard meteorological instruments. [Bolton. c___?.] 139 p. illus. 25½ cm.

Ridgley, Douglas C., & Koeppe, Clarence E.
Fundamentals of climate. Bloomington. c1932. 63 p. figs. 26½ cm.

Rossby, C[arl] G[ustaf.]
Thermodynamics applied to air mass analysis. Cambridge. 1932. 41 p. figs. tables. plates. 28 cm. (Mass. inst. tech., Met'l papers. v. 1, no. 3.)

Theodorsen, Theodore, & Clay, William C.
Ice prevention on aircraft by means of engine exhaust heat and a technical study of heat transmission from a Clark Y airfoil. Washington. 1932. 24 p. illus. 29 cm. (Nat. adv. comm. aeron., Report no. 403.)

Schmidt, Wilhelm.
Meteorologische Feldversuche über Frostabwehrmittel. Oppenheim a. Rh. n. d. 103 p. figs. plates (fold.) 22½ cm. (Fröste und Frostebekämpfung im Weinbau. Heft 4.)

SOLAR OBSERVATIONS

SOLAR RADIATION MEASUREMENTS DURING MARCH, 1932

By HERBERT H. KIMBALL, in charge Solar Radiation Investigations

For a description of instruments employed and their exposures, the reader is referred to the January, 1932, REVIEW, page 26.

Table 1 shows that solar radiation intensities averaged above the normal intensity for March at all three stations.

Table 2 shows an excess in the total solar radiation received on a horizontal surface at all stations except Twin Falls, although the excess is slight at Lincoln.

At Madison, no skylight polarization measurements were obtained during the month, as reflection from ice on the surface of the lake was a disturbing element. At Washington, measurements made on the 29th and 30th gave a mean of 58 per cent and a maximum of 64 per cent, which are average values for March at Washington.

Table 3 summarizes solar radiation measurements I_y and I_r, obtained by means of the yellow and red glass filters described in the February, 1932, REVIEW, and values of the coefficient of atmospheric turbidity derived therefrom.

TABLE 1.—*Solar radiation intensities during March, 1932*

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

Washington, D. C.

Date	Sun's zenith distance										
	8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	75th mer. time	Air mass									Local mean solar time
		A. M.					P. M.				
	e.	5.0	4.0	3.0	2.0	[1] 1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Mar. 1	3.00	0.97	1.07	1.20	1.33	1.50					3.30
Mar. 3	5.36			0.92	1.09	1.35					4.75
Mar. 5	4.95	0.79	0.92	1.04	1.25	1.46					4.17
Mar. 7	1.24		0.96	1.10	1.29	1.46					1.45
Mar. 8	1.02		0.98	1.13	1.28	1.50					1.12
Mar. 16	1.88			0.95							1.96
Mar. 24	4.75		0.55	0.74	0.83						3.00
Mar. 25	4.57					1.35					3.39
Mar. 29	4.37				1.18						3.00
Mar. 30	4.75		0.73	0.88	1.15	1.38					3.81
Means		(0.88)	0.87	1.00	1.18	1.43					
Departures		+0.15	+0.06	+0.05	+0.03	±0.00					

Madison, Wis.

Mar. 7	0.74		1.06	1.21	1.42	1.60	1.37	1.18			0.74
Mar. 10	0.86		1.13	1.26	1.43	1.65	1.43	1.25			1.12
Mar. 11	1.12		1.11	1.24	1.42	1.58	1.32	1.22			1.19
Mar. 12	1.19		1.11	1.23	1.44	1.59					1.32
Mar. 14	1.32		1.16	1.29	1.42	1.64					1.32

[1] Extrapolated.

TABLE 1.—*Solar radiation intensities during March, 1932*—Con.

Madison, Wis.—Continued

Date	Sun's zenith distance										
	8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	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.*
Mar. 17	2.46					1.47	1.23	1.08			2.49
Mar. 22	1.95			1.26	1.37		1.34				1.88
Mar. 23	3.00					1.55					2.16
Mar. 31	2.26				1.28						1.78
Means			1.11	1.25	1.40	1.58	1.34	1.18			
Departures			+0.07	+0.08	+0.08	+0.01	+0.04	+0.01			

Lincoln, Nebr.

Mar. 5	1.12			1.29	1.46	1.65					1.37
Mar. 8	0.56	1.03									0.96
Mar. 10	1.07	0.91	0.95	1.08	1.35						1.32
Mar. 12	1.32	1.01	1.13	1.27	1.46						1.52
Mar. 19	4.57				1.20						4.95
Mar. 23	2.62	0.91	0.98	1.02	1.31	1.59					3.15
Mar. 24	4.75	0.71	0.85	1.03	1.29	1.46	1.24	1.07			4.57
Mar. 26	4.17	0.81									3.81
Mar. 28	4.17				1.29	1.46					3.99
Mar. 29	4.57	0.62	0.80								5.16
Mar. 30	3.15						1.34				2.87
Mar. 31	3.81						1.24	1.04			2.64
Means		0.86	0.94	1.14	1.34	1.54	1.27	(1.06)			
Departures		+0.02	+0.01	+0.05	+0.07	−0.02	−0.01	−0.03			

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

Week beginning	Washington	Madison	Lincoln	Chicago	New York	Fresno	Pittsburgh	Fairbanks	Twin Falls	La Jolla	Gainesville	Miami	New Orleans
	Gram calories per square centimeter												
1932	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Feb. 26	268	202	241	198	231	418	209	157	309	[1] 320	492	474	264
Mar. 4	305	385	392	290	294	416	180	143	282	401	[1] 272	439	282
Mar. 11	367	388	378	267	368	339	219	202	316	361	[2] 466	499	244
Mar. 18	418	288	381	152	311	499	284	240	289	393	405	439	329
Mar. 25	303	369	482	274	251	530	282	258	298	444	[1] 526	509	263
	Departures from weekly normals												
Feb. 26	−19	−81	−98	+6	−2	+44	+33		+16	−28	+109	+94	
Mar. 4	−11	+84	+38	+90	+32	+41	−20		−22	+54	−114	+35	
Mar. 11	+38	+69	+2	+59	+94	−53	−7		−4	+13	+85	+67	
Mar. 18	+59	−31	−16	−68	+39	+49	+44		−48	+16	−10	−18	
Mar. 25	−43	+6	+75	+30	−22	+42	+36		−56	+36	+21	+34	
	Accumulated departures on Mar. 31												
	−553	−1,456	−910	+1,470	+1,435	+1,267	+693		−847	+2,093		+4,081	

[1] 6-day mean. [2] 4-day mean.

TABLE 3.—*Screened solar radiation measurements and determinations of the atmospheric turbidity factor, β. Washington, D. C., March, 1932*

[Values in italics have been interpolated]

Date and solar hour angle	Solar altitude, h.	Air mass, m.	I_m	I_y	I_r	β	Blueness of sky	Atmospheric dust particles per cubic centimeter	Notes
Mar. 1	° ′		gr. cal.	gr. cal.	gr. cal.				
4:28 a	12-42	4.54	1.019	*0.797*	0.668	0.040		273	
4:09 a	16-07	3.57	1.116	.866	*.715*	.052			
4:02 a	17-20	3.31	1.142	.875	.720	.049			
3:10 a	26-01	2.28	1.282	.928	*.747*	.048			
3:04 a	26-58	2.21	1.295	*.931*	.729	.039	5		Many Fr. Cu. Stopped by clouds.
0:52 a	42-06	1.49	1.407	*1.017*	.809	.078			
0:49 a	42-24	1.48	1.398	1.017	*.811*	.083			
Mar. 3									
3:54 a	19-24	2.99	.921	*.712*	.568	.083		1,014	
3:28 a	23-49	2.46	1.036	*.728*	.612	.078			
2:44 a	30-44	1.95	1.098	*.786*	.643	.100	4		
2:38 a	31-33	1.90	1.075	.788	*.643*	.126			
0:50 a	42-57	1.47	1.201	*.872*	.694	.127			
0:42 a	43-20	1.46	1.226	.878	*.694*	.112			
Mar. 5									
4:18 a	15-30	3.74	.944	*.724*	.605	.060		488	
3:46 a	21-10	2.76	1.082	.805	*.648*	.062			
3:42 a	22-02	2.65	1.086	*.812*	.665	.070			
2:53 a	29-56	2.00	1.250	*.906*	.735	.068			
2:47 a	30-50	1.94	1.260	.917	*.744*	.072			
1:38 a	39-45	1.56	1.331	.944	*.774*	.085			Stopped by clouds.
1:32 a	40-21	1.54	1.347	*.946*	.775	.080			
Mar. 8									
4:18 a	16-16	3.54	1.050	*.818*	.676	.058		502	
4:14 a	17-11	3.35	1.078	.825	*.690*	.060			
3:36 a	23-45	2.48	1.195	.888	*.722*	.062			
3:31 a	24-40	2.38	1.206	*.892*	.728	.065			
2:59 a	29-52	2.01	1.271	.925	*.748*	.068			
2:54 a	30-24	1.96	1.290	*.927*	.749	.065			
1:35 a	41-06	1.52	1.408	*.959*	.779	.060			
1:30 a	41-34	1.50	1.350	.961	*.789*	.095			
0:19 p	46-06	1.39	1.399	.919	*.746*	.052			
0:24 p	45-59	1.39	1.384	*.917*	.731	.048			
Mar. 23									
3:47 a	26-00	2.28	1.177	*0.874*	0.710	0.075		873	Ci. clouds disappearing.
3:40 a	27-11	2.19	1.183	.877	*.713*	.080			
2:19 a	40-40	1.53	1.280	*.929*	.731	.095			
2:11 a	40-49	1.50	1.315	.934	*.734*	.080			
0:29 a	51-40	1.27	1.334	*.971*	.748	.105			
0:22 a	51-55	1.27	1.318	.920	*.713*	.090			
Mar. 24									
4:48 a	14-54	3.84	.563	*.486*	.396	.145		2058	
4:24 a	19-29	2.98	.737	.674	*.469*	.125			
4:18 a	20-31	2.83	.735	*.618*	.495	.155			
3:41 a	27-25	2.16	.757	.674	*.567*				
2:38 a	38-15	1.62	1.040	.758	*.614*	.150			
2:34 a	38-48	1.60	1.016	*.760*	.612	.180			
Mar. 25									
0:38 a	52-02	1.27	1.243	.886	*.709*	.072		1432	
0:34 a	52-14	1.27	1.242	*.886*	.710	.074			
Mar. 29									
3:38 a	29-23	2.04	1.170	*.848*	.705	.092	6	691	
3:32 a	30-16	1.98	1.181	.858	*.709*	.092			
Mar. 30									
4:53 a	15-28	3.70	.775	*.581*	.491	.080	4	792	
4:46 a	16-44	3.44	.809	*.607*	*.501*	.080			
4:10 a	23-34	2.49	1.020	*.738*	.609	.080			
4:05 a	24-36	2.38	1.028	.747	*.620*	.090			
3:36 a	29-56	2.00	1.141	.828	*.665*	.085			
3:28 a	31-23	1.91	1.151	*.836*	.676	.090			
2:01 a	45-30	1.39	1.285	.895	*.715*	.095			
1:54 a	46-28	1.38	1.294	*.907*	.717	.095			
0:40 a	53-48	1.24	1.329	.926	*.731*	.100			
0:35 a	54-05	1.24	1.321	*.930*	.731	.110			
0:54 p	52-56	1.25	1.296	*.870*	*.704*	.100			
0:59 p	52-35	1.26	1.290	*.867*	.701	.100			

POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, Superintendent United States Naval Observatory. Data furnished by Naval Observatory, in cooperation with Harvard, Yerkes-Perkins, and Mount Wilson Observatories. The differences of longitude are measured from central meridian, positive west. The north latitudes are plus. Areas are corrected for foreshortening and are expressed in millionths of sun's visible hemisphere. The total area, including spots and groups, is given for each day in the last column]

Date	Eastern standard civil time		Heliographic: Diff. long.	Heliographic: Longitude	Heliographic: Latitude	Area: Spot	Area: Group	Total area for each day
1932	H	m	°	°	°			
Mar. 1 (Naval Observatory)	10	45	−39.0	108.6	+12.0	------	278	------
			−18.0	129.6	−5.0	------	25	------
			+50.0	197.6	+6.0	------	185	488
Mar. 2 (Naval Observatory)	13	9	−23.0	110.1	+11.0	------	278	------
			−3.0	130.1	−5.0	15	------	------
			+65.0	198.1	+6.0	------	432	725
Mar. 3 (Naval Observatory)	11	0	−10.0	111.1	+11.0	------	247	------
			+80.0	201.1	+6.0	------	309	556
Mar. 4 (Yerkes Observatory)	11	31	−40.9	66.8	+7.5	------	13	------
			−4.5	103.2	+10.0	------	30	------
			−1.6	106.1	+10.6	5	------	------
			0.0	107.7	+10.5	3	------	------
			+6.0	113.7	+12.0	------	280	331
Mar. 5 (Naval Observatory)	10	40	−29.0	66.0	+8.0	31	------	------
			+16.0	111.0	+11.0	------	247	278
Mar. 6 (Yerkes Observatory)	12	36	+23.9	104.7	+9.8	16	------	------
			+27.5	108.3	+10.1	------	23	------
			+32.0	112.8	+12.0	304	------	343
Mar. 7 (Naval Observatory)	10	41	+45.0	113.6	+12.0	------	216	216
Mar. 8 (Naval Observatory)	10	52	+59.0	114.3	+12.0	------	185	185
Mar. 9 (Naval Observatory)	10	52	+72.0	114.2	+12.0	170	------	170
Mar. 10 (Naval Observatory)	10	8	No spots			------	------	------
Mar. 11 (Naval Observatory)	10	20	No spots			------	------	------
Mar. 12 (Naval Observatory)	10	44	No spots			------	------	------
Mar. 13 (Naval Observatory)	13	32	No spots			------	------	------
Mar. 14 (Naval Observatory)	10	48	No spots			------	------	------
Mar. 15 (Naval Observatory)	10	25	No spots			------	------	------
Mar. 16 (Naval Observatory)	11	33	No spots			------	------	------
Mar. 17 (Naval Observatory)	11	59	−48.0	248.1	−8.0	------	93	93
Mar. 18 (Naval Observatory)	11	42	−34.0	249.1	−8.0	------	62	62
Mar. 19 (Naval Observatory)	10	42	−22.0	248.5	−8.0	------	46	46
Mar. 20 (Naval Observatory)	12	39	No spots			------	------	------
Mar. 21 (Mount Wilson)	11	50	+16.0	259.5	−7.0	------	15	15
Mar. 22 (Naval Observatory)	14	41	No spots			------	------	------
Mar. 23 (Naval Observatory)	11	4	No spots			------	------	------
Mar. 24 (Naval Observatory)	11	2	No spots			------	------	------
Mar. 25 (Naval Observatory)	10	44	−79.0	112.3	+14.0	46	------	46
Mar. 26 (Naval Observatory)	10	10	−64.0	114.4	+14.0	46	------	46
Mar. 27 (Mount Wilson)	13	40	−50.0	113.3	+12.0	44	------	------
			−28.0	135.3	−6.0	------	6	50
Mar. 28 (Naval Observatory)	14	49	−34.0	115.5	+14.0	46	------	46
Mar. 29 (Naval Observatory)	10	15	−24.0	114.8	+13.0	46	------	46
Mar. 30 (Naval Observatory)	12	7	−10.0	114.6	+13.0	46	------	46
Mar. 31 (Mount Wilson)	9	45	+2.0	114.6	+12.0	66	------	66
Mean daily area for March								124

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR MARCH, 1932

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

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

March, 1932	Relative numbers	March, 1932	Relative numbers	March, 1932	Relative numbers
1	34	11	0	21	7
2	46	12	0	22	7
3	37	13	0	23	0
4	a 24	14	0	24	7
5	22	15	0	25	0
6	22	16	0	26	8
7	16	17	------	27	15
8	------	18	------	28	8
9	------	19	9	29	8
10	8	20	7	30	8
				31	7

Mean: 27 days=11.1.

a=Passage of an average-sized group through the central meridian.