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:

Abbot, C. G.
Über Temperaturen in Washington und kurzperiodische Veränderungen in der Intensität der Sonnenstrahlung. p. 735–746. figs. 24½ cm. (Strahlentherapie. 39. Bd. (1931).)

Banerji, Sudhansu Kumar.
Effect of Indian mountain ranges on air motion. Calcutta. [1930.] p. 699–745. figs. 25 cm. (Repr.: Indian journ. physics. v. 5, pt. 7.)

Conrad, V., & Huber, H.
Zur Reaktionsgeschwindigkeit beim Campbell-Stokesschen Sonnenscheinautographen. p. 376–381. 24½ cm. (Strahlentherapie. 39. Bd. (1931).)

Davis, Raymond, & Gibson, K. S.
Filters for the reproduction of sunlight and daylight and the determination of color temperature. Washington. 1931. 165 p. figs. 23½ cm. (Misc. pub. Bur. stand. no. 114. Jan. 21, 1931.)

Faber, O. M.
Physikalische Staubbestimmungen. Halle. 1930. vi, 60 p. figs. 21 cm. (Messen und Prüfen. H. 2.)

Free, E. E.
Soot particles in New York City air. p. 9–12, 1–2. 28½ cm. (Trans. Amer. soc. mech. engin. v. 53, no. 1, Jan. Apr. 1931.)

Gorczynski, Wladyslaw.
Über hohe Werte der Sonnenstrahlungs-Intensität, die auf den Ozeanen, an Landstationen und in den höheren Luftschichten beobachtet wurden. p. 588–600. 24½ cm. (Strahlentherapie. 39. Bd. (1931).)

Joerg, W. L. G.
Brief history of polar exploration since the introduction of flying. To accompany a physical map of the Arctic and a bathymetric map of the Antarctic. 2nd. rev. ed. New York. 1930. 95 p. figs. maps. 25½ cm.

Jones, Inigo.
Seasonal forecasting. Brisbane. 1930. 8 p. plate. 24 cm.

Simpson, G. C.
Thunder and lightning, being the thirty-second Robert Boyle lecture . . . Oxford. 1930. p. 103–113. plate. 21½ cm.

Sjöström, Martin.
Pyrheliometric measurements of the solar radiation in Upsala during the years 1909–1922. . . . Uppsala. (1930.) 209 p. figs. 29 cm. (Nova acta reg. soc. sci. Upsal. ser. 4, v. 6, No. 6.)

Spurr, Henry Vose.
Wind bracing; the importance of rigidity in high towers. 1s ed. New York. 1930. x, 132 p. illus. diagrs. 24 c m

SOLAR OBSERVATIONS

SOLAR RADIATION MEASUREMENTS OBTAINED DURING MARCH, 1931

By HERBERT H. KIMBALL

For a description of instruments employed and their exposures, the reader is referred to page 41 of this volume of the REVIEW.

Table 1 shows that solar radiation intensities averaged slightly above the normal intensity for March at Madison, Wis., and Lincoln, Nebr., and close to normal at Washington, D. C. But few observations were obtained at the latter station on account of unusually cloudy conditions during the month.

Table 2 shows a deficiency in the total solar radiation received on a horizontal surface directly from the sun and diffusely from the sky at all stations for which normal values have been established, except at Gainesville, Fla., Twin Falls, Idaho, and Fresno, Calif., which report a considerable excess.

Skylight polarization measurements were obtained at Washington on only two days. They give a mean percentage of 56, with a maximum of 60 per cent on the 25th. At Madison, a measurement made on the 28th gave a percentage of 66. These are not far from average values for March at the respective stations.

SOLAR RADIATION MEASUREMENTS FROM TULANE UNIVERSITY, NEW ORLEANS, LA.

With this month there appears in Table 2 for the first time solar radiation data from Tulane University, New Orleans, La., latitude 29° 56′ N., longitude 90° 7′ W., altitude, 40 feet above sea level. The data are furnished by Prof. Henry Laurens, department of physiology of the university.

With reference to the exposure of the pyrheliometer, Professor Laurens writes that it is on a platform 40 feet above sea level, and a sketch which he furnishes shows buildings and trees in its vicinity somewhat higher than the platform. While it does not appear that any of these objects should cut off the direct rays of the sun except when the latter is near the horizon, they will cut off a considerable amount of sky radiation. The hourly totals are thereby reduced by a small but known amount.

The Eppley pyrheliometer was carefully standardized at this office before it was sent to Professor Laurens. The records are reduced by him, using our calibration results.

TABLE 1.—*Solar radiation intensities during March, 1931*

[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. 4	3.00	------	------	0.88	------	------	------	------	------	------	2.62
Mar. 5	2.49	------	0.76	0.89	1.13	------	------	------	------	------	2.49
Mar. 11	8.38	------	0.86	0.92	------	------	------	------	------	------	2.26
Mar. 12	8.58	------	0.83	1.00	1.19	------	------	------	------	------	2.16
Mar. 13	2.49	------	0.92	1.03	1.28	------	------	------	------	------	2.74
Mar. 18	3.45	------	0.84	0.98	1.20	------	------	------	------	------	3.45
Mar. 24	3.00	------	0.74	------	------	------	------	------	------	------	3.45
Mar. 26	5.16	------	0.62	0.81	1.00	------	------	------	------	------	5.16
Means	------	------	**0.80**	**0.93**	**1.16**	------	------	------	------	------	------
Departures	------	------	**+0.00**	**−0.02**	**+0.01**	------	------	------	------	------	------

Madison, Wis.

Mar. 2	2.16	0.97	1.08	1.20	1.36	------	1.35	------	------	------	2.36
Mar. 3	2.62	------	1.04	1.17	------	------	------	------	------	------	2.36
Mar. 4	1.96	1.04	1.03	1.16	------	------	------	------	------	------	1.88
Mar. 9	2.16	------	------	------	------	------	1.30	------	------	------	1.45
Mar. 10	1.96	------	------	1.29	1.43	------	------	------	------	------	1.52
Mar. 11	2.49	------	------	------	------	------	1.33	------	------	------	2.36
Mar. 25	3.99	------	------	------	1.30	------	------	------	------	------	3.81
Mar. 30	2.16	------	1.03	1.16	1.29	1.53	1.31	------	------	------	2.49
Means	------	**(1.00)**	**1.04**	**1.20**	**1.34**	------	**1.32**	------	------	------	------
Departures	------	**+0.02**	**+0.01**	**+0.04**	**+0.03**	------	**+0.03**	------	------	------	------

[1] Extrapolated.

TABLE 1.—*Solar radiation intensities during March, 1931*—Con.

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

Lincoln, Nebr.

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. 9	1.96				1.40						3.00
Mar. 10	3.15						1.21	0.93	0.78	0.60	3.63
Mar. 13	4.57		0.82	1.01	1.28		1.34		1.03	0.94	5.36
Mar. 14	3.63		0.97	1.08	1.26						3.81
Mar. 15	2.62					1.64	1.43	1.29	1.10	1.00	2.16
Mar. 16	2.36		0.86	1.13	1.32						2.06
Mar. 18	3.99			1.06	1.26		1.29	1.09	0.93	0.78	4.37
Mar. 25	3.15		0.72	1.03							2.49
Means			0.84	1.06	1.30		1.32	1.10	0.96	0.83	
Departures			−0.09	−0.03	+0.03		+0.04	+0.01	+0.01	+0.01	

TABLE 2.—*Total solar radiation (direct + diffuse) received on a horizontal surface*

[Gram-calories per square centimeter]

Week beginning—	Average daily totals											
	Washington	Madison	Lincoln	Chicago	New York	Twin Falls	Pittsburgh	Gainesville	Fresno	La Jolla	Miami	New Orleans
1931	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.
Feb. 26	314	282	296	184	247	369	185	352	427	339	240	----
Mar. 5	323	331	310	149	198	372	168	472	402	360	259	382
Mar. 12	309	165	423	114	311	321	203	428	448	330	405	348
Mar. 19	286	242	329	276	260	435	180	453	446	356	491	264
Mar. 26	292	287	291	188	204	356	149	508	550	410	430	234
	Departures from weekly normals											
Feb. 26	+26	−5	−49	−5	+17	+75	+14	−40	+57	−7	----	----
Mar. 5	+7	+34	−42	−43	−58	+66	−34	+80	+18	+21	----	----
Mar. 12	−18	−150	+48	−90	+45	−6	−23	+58	+33	−8	----	----
Mar. 19	−69	−79	−69	+55	−6	+85	−47	+56	−26	−14	----	----
Mar. 26	−57	−76	−111	−49	−70	+3	−82	+36	+39	+6	----	----
Accumulated departures on Apr. 1, 1931	−499	−2,898	−1,001	−798	+546	----	−1,179	+1,283	+497	+140	----	----

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			Area		Total area for each day
			Diff. long.	Longitude	Latitude	Spot	Group	
1931	h	m	°	°	°			
Mar. 1 (Yerkes Observatory)	12	42	−31.6	265.7	−7.6	24	------	------
			−30.8	266.5	−8.8	18	------	------
			−30.0	267.3	−8.9	17	------	------
			−30.0	267.3	−8.5	35	------	------
			−28.6	268.7	−9.2	34	------	------
			−25.8	271.5	−7.4	17	------	------
			−24.2	273.1	−6.8	17	------	------
			−23.1	274.2	−6.8	98	------	260
Mar. 2 (Naval Observatory)	11	44	−65.0	219.6	−7.0	------	62	------
			−13.5	271.1	−8.0	------	216	278
Mar. 3 (Yerkes Observatory)	12	48	−56.2	214.7	−10.3	------	106	------
			−52.8	218.1	−9.2	12	------	------
			−47.2	223.7	−9.5	44	------	------
			−4.3	266.6	−9.2	------	60	------
			−3.9	267.0	−9.6	------	60	------
			+4.4	275.3	−7.6	180	------	462
Mar. 4 (Naval Observatory)	12	31	−36.0	221.9	−2.5	------	185	------
			+19.0	276.9	−10.0	123	------	308
Mar. 5 (Naval Observatory)	11	50	−25.0	220.1	−8.0	------	154	------
			+11.0	256.1	−32.0	3	------	------
			+29.0	274.1	−9.0	------	185	342
Mar. 6 (Naval Observatory)	11	41	−12.0	220.0	−8.5	------	123	------
			+40.0	272.0	−10.0	------	154	277
Mar. 7 (Naval Observatory)	11	18	+2.0	221.0	−10.0	------	123	------
			+55.0	274.0	−10.5	------	123	246
Mar. 8 (Mount Wilson)	13	0	−89.0	115.9	+8.0	55	------	------
			+15.0	219.9	−10.0	------	89	------
			+70.0	274.9	−10.0	------	195	339
Mar. 9 (Naval Observatory)	11	34	−75.0	117.5	+10.0	------	247	------
			+30.0	222.5	−10.5	------	93	------
			+85.0	277.5	−12.0	------	93	433
Mar. 10 (Naval Observatory)	11	53	−80.0	99.2	+11.5	------	62	------
			−60.0	119.2	+8.0	------	309	------
			+42.0	221.2	−12.0	------	154	525

Positions and areas of sun spots—Continued

Date	Eastern standard civil time		Heliographic			Area		Total area for each day
			Diff. long.	Longitude	Latitude	Spot	Group	
1931	h	m	°	°	°			
Mar. 11 (Naval Observatory)	11	34	−47.0	119.2	+8.0	------	463	------
			+16.0	182.2	−10.0	6	------	------
			+57.0	223.2	−11.0	------	62	531
Mar. 12 (Naval Observatory)	11	37	−50.0	103.0	+10.5	------	93	------
			+33.0	186.0	+7.5	------	494	------
			+76.0	229.0	−12.0	------	62	649
Mar. 13 (Naval Observatory)	11	37	−72.0	67.8	+10.5	------	154	------
			−38.0	101.8	+10.0	------	93	------
			−21.0	118.8	+6.5	------	432	679
Mar. 14 (Naval Observatory)	10	52	−60.0	67.0	+10.0	185	------	------
			−23.0	104.0	+10.0	------	93	------
			−8.0	119.0	+6.0	------	340	618
Mar. 15 (Mount Wilson)	11	20	−46.0	67.6	+8.0	257	------	------
			−8.0	105.6	+8.0	------	24	------
			+5.0	118.6	+5.0	------	403	684
Mar. 16 (Mount Wilson)	14	30	−30.0	68.7	+8.0	230	------	------
			+7.0	105.7	+8.0	------	4	------
			+20.0	118.7	+5.0	------	307	------
			+67.0	165.7	−3.0	8	------	549
Mar. 17 (Naval Observatory)	10	57	−18.0	69.4	+9.0	216	------	------
			+16.0	103.4	+9.0	------	15	------
			+32.0	119.4	+5.0	------	247	------
			+80.0	167.4	+2.0	------	93	571
Mar. 18 (Naval Observatory)	11	5	−4.0	70.2	+8.0	123	------	------
			+12.0	86.2	+11.0	15	------	------
			+23.0	97.2	+11.5	15	------	------
			+43.0	117.2	+5.0	------	216	------
			+75.0	149.2	−7.0	15	------	384
Mar. 19 (Yerkes Observatory)	15	41	−22.0	36.5	+7.7	17	------	------
			−19.1	39.4	+7.7	16	------	------
			−2.4	56.1	−19.3	------	31	------
			+0.2	58.7	−20.8	20	------	------
			+10.9	69.4	+6.0	------	125	------
			+57.8	116.3	+4.1	------	116	------
			+57.2	115.7	+6.2	------	29	------
			+65.2	123.7	+1.7	36	------	------
			+62.3	120.8	+7.6	17	------	------
			+60.8	119.3	+10.5	33	------	440
Mar. 20 (Naval Observatory)	11	51	−8.0	39.4	+9.0	------	9	------
			+10.0	57.4	−20.0	------	19	------
			+23.0	70.4	+7.5	154	------	------
			+80.0	127.4	+1.0	------	62	244
Mar. 21 (Naval Observatory)	11	1	+8.0	42.7	+9.0	6	------	------
			+25.0	59.7	−21.0	6	------	------
			+37.5	72.2	+7.0	123	------	135
Mar. 22 (Mount Wilson)	11	30	+23.0	44.2	+7.0	5	------	------
			+39.0	60.2	−22.0	6	------	------
			+50.0	71.2	+6.0	145	------	156
Mar. 23 (Naval Observatory)	11	48	+65.0	72.8	+5.0	123	------	123
Mar. 24 (Naval Observatory)	11	38	−75.0	279.8	−5.0	93	------	------
			+80.0	74.8	+6.0	93	------	186
Mar. 25 (Naval Observatory)	11	29	−62.0	279.7	−6.5	93	------	93
Mar. 26 (Naval Observatory)	11	40	−48.0	280.4	−6.5	123	------	------
			+75.0	43.4	+15.0	31	------	154
Mar. 27 (Naval Observatory)	12	18	−32.0	282.8	−7.0	93	------	93
Mar. 29 (Naval Observatory)	10	46	−9.0	280.3	−8.0	123	------	123
Mar. 30 (Naval Observatory)	11	37	+8.0	283.6	−8.0	62	------	62
Mar. 31 (Perkins Observatory)	14	30	−37.0	223.8	+15.0	------	93	------
			+17.0	277.8	+2.0	------	124	------
			+60.0	320.8	−11.0	------	155	372
Mean daily area for March								344

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR MARCH, 1931 [1]

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

March, 1931	Relative numbers	March, 1931	Relative numbers	March, 1931	Relative numbers
1	Ec 34	11	38	21	26
2	31	12	38	22	25
3	*a* 24	13	*d* 43	23	17
4	--------	14	47	24	*a* 16
5	--------	15	*b* 46	25	8
6	--------	16	41	26	8
7	*a* 28	17	Wc 51	27	8
8	--------	18	*a* 49	28	14
9	*d* 32	19	38	29	16
10	32	20	40	30	9
				31	WEcc 27

Mean: 27 days 29.1.

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

a = Passage of an average-sized group through the central meridian.
b = Passage of a large group through the central meridian.
c = New formation of a center of activity: E, on the eastern part of the sun's disk; W, on the western part; M, in the central zone.
d = Entrance of a large or average-sized center of activity on the east limb.