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.
Weather dominated by solar changes. Washington. 1931. 18 p. figs. 24½ cm. (Smith. misc. coll., v. 85, no. 1.)

Curry, Manfred.
Wind and water. London. [1930.] 28, 14 p. plates. 30½ cm.

Elm, Ienar Ewald.
Weather and why; an aviator's presentation of aeronautical meteorology . . . Philadelphia. [c1929.] 109 p. front. illus. plates. diagrs. 21½ cm.

Gillette, Halbert P.
Electrodynamic theory of cyclones and anticyclones. p. 22–23. 29½ cm. (Water works and sewerage. v. 78, Jan., 1931.)

Jaumotte, J.
Un nouveau météorographe pour ballon-sonde. Bruxelles. 1930. 44 p. figs. 29½ cm. (Inst. roy. mét. de Belgique. Mém. v. 3.)

Köppen, W., & Geiger, R., *comp.*
Handbuch der Klimatologie. Berlin. 1930. Bd. 1. Teil A, D, E. Bd. 2. Teil G.

Kopfmüller, A.
Verbessertes Graukeilphotometer. [2 p.] 24 cm. (Ztschr. für wissensch. Bäderkunde. 1930. H. 11.)

Kuiper, P. Feenstra.
De groene straal. Helder. n. d. 71 p. figs. plate. 24½ cm.

Lucio, R.
La legitimidad de las inferencias dos probables periodos del tiempo. Teoria de los ciclones tropicales. Mexico. 1930. 344 p. 17 cm.

Lundegårdh, Henrik Gunnar.
Klima und Boden in ihrer Wirkung auf das Pflanzenleben. Zweite, verb. Aufl. Jena. 1930. x, 480 p. illus. maps. diagrs. 24 cm.

Maguire, Charles Joseph.
Aerology; a ground school manual in aeronautical meteorology. 1st ed. New York. 1931. xii, 136 p. illus. maps (part fold.) diagrs. 23½ cm.

Myrbach, Otto.
Wanderers Wetterbuch. Einführung in das Verständnis der Wettervorgänge. Leipzig. n. d. 184 p. illus. 18 cm.

Pardé, Maurice.
Le régime du Mississippi. Grenoble. n. d. p. 583–693. figs. 25½ cm. (Rev. de géogr. Alpine, v. 18, fasc. 4, 1930.)

Refsdal, Anfinn.
Der feuchtlabile Niederschlag. Oslo. 1930. 71 p. figs. 31 cm. (Geofysiske publ. v. 5, no. 12.)

Schaffers, V.
Le paratonnerre dans les missions et aux colonies. [Bruxelles.] n. d. 32 p. figs. 17½ cm. (Extr.: Rev. miss. des Jésuites belges, Louvain.)

SOLAR OBSERVATIONS

SOLAR RADIATION MEASUREMENTS, FEBRUARY, 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 I shows that solar radiation intensities averaged above the normal intensity for February at Washington, D. C., and below normal at Madison, Wis., and Lincoln, Nebr. Both these stations reported much dense local smoke during the month.

Table 2 shows an excess in the total solar radiation received on a horizontal surface directly from the sun and diffusely from the sky at Lincoln, Chicago, and New York, and a deficiency at all other stations, which was pronounced at Fresno and Pittsburgh.

Skylight polarization measurements were obtained at Washington on seven days, and give a mean percentage of 61, with a maximum of 64 on the 25th. These are close to the corresponding averages for Washington in February. No measurements were obtained at Madison during this month, as the groundwas continuously covered with snow.

TABLE 1.—*Solar radiation intensities during February, 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	1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Feb. 3	1.60	0.76	0.90	1.05	------	------	1.26	1.04	0.88	0.74	2.06
Feb. 4	3.45	------	------	------	------	------	1.14	1.05	0.89	0.69	4.37
Feb. 5	2.49	0.78	0.94	0.97	1.17	------	------	1.02	0.80	0.70	2.16
Feb. 10	2.36	0.83	0.94	1.06	1.26	------	------	------	------	------	1.78
Feb. 11	1.45	0.85	0.93	1.00	1.19	------	1.13	0.95	0.86	0.75	1.37
Feb. 24	3.63	------	------	------	------	------	1.15	------	------	------	2.74
Feb. 25	2.49	0.90	1.07	1.25	1.27	------	1.33	1.05	0.87	------	2.49
Feb. 26	3.30	------	1.01	1.14	1.28	------	------	------	------	------	2.36
Feb. 27	2.62	0.87	0.99	1.15	1.27	------	1.20	0.98	0.82	------	1.96
Means	------	**0.83**	**0.97**	**1.09**	**1.24**	------	**1.20**	**1.02**	**0.85**	**0.72**	------
Departures	------	**+0.11**	**+0.16**	**+0.11**	**+0.07**	------	**+0.01**	**+0.04**	**+0.01**	**−0.04**	------

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

Madison, Wis.

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.*
Feb. 4	3.30	1.08	1.10	1.26	1.16	------	------	------	------	------	3.00
Feb. 5	3.30	0.69	0.83	0.97	1.25	------	1.16	1.01	------	------	3.63
Feb. 10	1.37	0.65	0.77	0.98	1.23	------	1.26	0.72	------	------	1.60
Feb. 11	2.87	------	------	------	------	------	1.15	------	------	------	3.45
Feb. 13	2.62	1.00	1.11	1.24	1.43	1.64	1.46	------	------	------	1.37
Feb. 14	1.12	1.05	1.11	1.29	1.41	------	1.35	------	------	------	1.24
Feb. 21	3.81	------	0.55	0.79	1.11	------	------	------	------	------	3.63
Feb. 25	4.75	------	------	------	------	------	1.36	1.21	------	------	3.63
Feb. 26	3.45	0.97	1.09	1.22	1.41	1.60	1.34	------	------	------	2.36
Means	------	**0.91**	**0.94**	**1.11**	**1.29**	**(1.62)**	**1.30**	**0.98**	------	------	------
Departures	------	**−0.03**	**−0.14**	**−0.09**	**−0.07**	------	**−0.06**	**−0.19**	------	------	------

Lincoln, Nebr.

Feb. 2	3.81	0.55	0.56	------	1.37	------	1.35	1.23	1.10	0.96	5.16
Feb. 3	4.37	0.95	1.09	1.24	1.38	------	1.35	1.20	1.09	------	4.37
Feb. 11	3.63	------	0.85	0.99	1.26	------	------	------	------	------	4.17
Feb. 14	1.32	0.85	0.99	1.18	1.31	------	1.33	1.15	0.96	0.77	1.68
Feb. 19	3.45	------	------	------	------	------	1.22	1.03	------	------	3.63
Feb. 20	3.15	0.60	0.74	0.88	1.08	------	------	------	------	------	3.81
Feb. 27	5.36	------	0.67	0.78	1.25	------	------	------	------	------	4.57
Means	------	**0.74**	**0.82**	**1.01**	**1.28**	------	**1.31**	**1.15**	**1.05**	**(0.86)**	------
Departures	------	**−0.17**	**−0.20**	**−0.17**	**−0.09**	------	**−0.04**	**−0.01**	**+0.02**	**−0.06**	------

[1] Extrapolated.

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

[Gram-calories per square centimeter]

Week beginning—	Washington	Madison	Lincoln	Chicago	New York	Twin Falls	Pittsburgh	Gainesville	Fresno	La Jolla	Miami
	Average daily totals										
1931	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.
Jan. 29	217	160	290	135	170	----	119	316	182	206	240
Feb. 5	195	209	291	129	135	----	142	341	245	250	305
Feb. 12	220	218	260	150	154	----	115	311	280	251	300
Feb. 19	226	244	256	142	228	----	106	314	407	334	222
	Departures from weekly normals										
Jan. 29	+17	−30	+59	+16	+29	----	−6	+11	−38	−36	----
Feb. 5	−7	±0	+29	+5	−2	----	+1	+34	−54	+6	----
Feb. 12	−6	−10	−20	+10	+4	----	−39	−8	−56	−24	----
Feb. 19	−29	−6	−45	−22	+44	----	−40	−52	+54	+10	----
Accumulated departures on Feb 26	+280	−966	+560	+126	+1,050	----	+21	−77	−350	+154	----

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	°	°	°			
Feb. 1 (Naval Observatory)	11	9	No spots					
Feb. 2 (Naval Observatory)	11	41	−80.0	213.4	+10.0		62	62
Feb. 3 (Naval Observatory)	11	38	−65.0	215.3	+10.5		231	
			−44.5	235.8	−10.5	6		237
Feb. 4 (Naval Observatory)	11	38	−50.0	217.1	+9.5		154	
			−28.0	239.1	−12.0	9		
			+68.0	335.1	+8.0		12	175
Feb. 5 (Naval Observatory)	11	44	−38.0	215.9	+10.0		201	
			−12.0	241.9	−12.5	3		204
Feb. 6 (Naval Observatory)	11	46	−23.5	217.2	+10.0		262	
			−10.5	230.2	−31.5	3		265
Feb. 8 (Yerkes Observatory)	16	6	+5.3	217.3	+8.9		326	
			+4.0	216.0	+10.0	102		428
Feb. 9 (Mount Wilson)	11	30	−89.0	112.3	+8.0	16		
			+16.0	217.3	+9.0		214	
			+41.0	242.3	−16.0		8	
			+55.0	256.3	−14.0		18	256
Feb. 10 (Naval Observatory)	11	51	+30.0	218.0	+9.0		108	
			+87.5	275.5	−12.5		62	170
Feb. 11 (Naval Observatory)	12	28	−63.0	111.5	+9.0		15	
			+45.0	219.5	+5.0		62	77
Feb. 12 (Naval Observatory)	12	46	−45.0	116.1	+8.0		62	
			+59.0	220.1	+5.0	46		108
Feb. 13 (Yerkes Observatory)	12	34	−35.0	113.1	+6.3		52	
			−30.2	117.9	+6.2		57	
			+67.8	215.9	+7.7	82		191
Feb. 14 (Naval Observatory)	12	43	−80.0	54.8	+0.1	15		
			−79.0	55.8	+8.5	12		
			−18.0	116.8	+4.0		59	86
Feb. 15 (Naval Observatory)	11	32	−70.0	52.3	+9.0		46	
			−66.0	56.3	+0.1		46	
			−10.0	112.3	−7.5		25	
			−2.0	120.3	+4.0	6		
			+4.5	126.8	+3.0	3		
			+12.0	134.3	+10.5	6		132
Feb. 16 (Naval Observatory)	14	39	−57.5	49.9	−16.0		62	
			−50.0	57.4	−22.0		77	
			+15.0	122.4	+8.0	12		
			+18.0	125.4	+11.0	15		166
Feb. 17 (Mount Wilson)	13	50	−42.5	52.2	+6.0		219	
			−37.5	57.2	−4.0		147	
			+42.0	136.7	+12.0		103	469
Feb. 18 (Mount Wilson)	13	55	−27.5	54.0	+6.0		349	
			−24.0	57.5	−3.0	149		
			+57.0	138.5	+12.0		31	529

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	°	°	°			
Feb. 19 (Mount Wilson)	13	15	−14.5	54.2	+6.0		1,265	
			−10.0	58.7	−3.0		153	
			0.0	68.7	+9.0		71	
			+67.0	135.7	+12.0		4	1,493
Feb. 20 (Mount Wilson)	14	10	+1.0	56.0	+7.0		1,571	
			+4.0	59.0	−3.0		42	
			+15.0	70.0	+9.0		40	1,653
Feb. 21 (Naval Observatory)	12	39	+15.0	57.7	−7.0		123	
			+17.5	60.2	+5.0		1,389	
			+28.0	70.7	+7.5		77	1,589
Feb. 22 (Naval Observatory)	11	37	−45.0	75.0	+12.5		247	
			+26.0	56.0	−5.0		370	
			+28.0	58.0	+5.5		1,389	
			+40.0	70.0	+7.5		15	2,021
Feb. 23 (Naval Observatory)	12	5	−65.0	311.7	+10.0		77	
			−30.0	346.7	+13.5		154	
			+40.0	56.7	−5.5		463	
			+42.0	58.7	+7.5		1,080	1,774
Feb. 24 (Naval Observatory)	11	33	−50.0	313.8	+11.0		77	
			−16.0	347.8	+12.5		185	
			+53.0	56.8	−5.0		309	
			+55.0	58.8	+7.0		926	1,497
Feb. 25 (Naval Observatory)	12	12	−85.0	265.3	−3.5		62	
			−38.0	312.3	+1.5		93	
			−1.0	349.3	+11.5		185	
			+26.0	16.3	+10.5	6		
			+67.0	57.3	−6.5		216	
			+68.0	58.3	+6.0		525	1,087
Feb. 26 (Naval Observatory)	11	33	−69.0	268.4	−4.0		154	
			−45.0	292.4	+10.0		93	
			−22.0	315.4	+9.0	9		
			+13.0	350.4	+10.5		154	
			+38.0	15.4	+9.5		62	
			+77.0	54.4	+6.0		216	
			+80.0	57.4	−7.0		247	935
Feb. 27 (Naval Observatory)	11	37	−55.0	269.2	−4.0		154	
			−31.0	293.2	−10.5	3		
			−30.0	294.2	+9.0		62	
			−5.0	319.2	+8.0	6		
			+22.0	346.2	+11.5		46	
			+29.0	353.2	+8.0	12		
			+52.0	16.2	+8.5		31	314
Feb. 28 (Naval Observatory)	11	32	−40.0	271.1	−5.0		247	
			+4.0	315.1	+9.0	3		
			+42.0	353.1	+7.5	9		
			+63.0	14.1	+9.0	31		290
Mean daily area for February								600

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR FEBRUARY, 1931

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

(Dependent alone on observations at Zurich and its station at Arosa)

February, 1931	Relative numbers	February, 1931	Relative numbers	February, 1931	Relative numbers
1	0	11	20	21	96
2	8	12	Ec 20	22	--------
3	d 28	13	23	23	100
4	--------	14	Ecd 19	24	92
5	25	15	41	25	a 68
6	29	16	44	26	d 82
7	19	17	--------	27	72
8	a 27	18	45	28	47
9	29	19	--------		
10	28	20	ab		

Mean: 23 days=41.8.

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 large or average-sized 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.