Tandler, T.

De meteoris libris aliisque solertioribus philosophis conscripta, & disputationibus exposita a Tobia Tandlero. Wittebergae, Typis Johann. Gormanni, Anno Christi (1613). 192 p. 15½ cm.

Venturelli, Lucia

Contatti di masse d'aria calda e d'aria fredda nell'atmosfera in relazione alla situazione barica. Milano. 1933. 24 p. figs. 24 cm. (Excerpt: Bollettino del Comitato nazionale italiano per la geodesia e la geofisica. Seconda seria. Anno 3. N. 1–2, Luglio 1933-XI.)

Walter, B.

Über den Unterschied in der Blitzgefahr für hart und für weich gedeckte Gebäude . . . Berlin. 1931. 4 p. illus. 30 cm. (Sonderabdruck aus der Elektrotechnischen Zts. 52. Jahrg. 1931, Heft 3, Seite 72.)

Williamson, Robert M.

Tornado characteristics: The Nashville tornado of March 14, 1933: A brief review of tornadoes in Tennessee. Nashville. 1933. p. 237–248. figs. 23½ cm. (Extr.: Journal Tennessee academy of science. v. 8. no. 3. July, 1933.)

Winkler, Johann Heinrich

De avertendi fvlminis artificio ex doctrina electricitatis disserit atqve ad trigam orationvm memoriae Heinricianae Ridelianae et Sevfertianae sacrarvm qvae in avditorio philosophorvm D. XV. Septembris A. R. S. MDCCLII . . . Lipsiae. 1753. 20 p. front. (engraving). 22½ cm.

SOLAR OBSERVATIONS

SOLAR RADIATION MEASUREMENTS DURING SEPTEMBER 1933

By IRVING F. HAND, Assistant in Solar Radiation Investigations

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

Beginning with this issue, summaries of the total radiation (direct + diffuse) received on a horizontal surface at the Harvard Meteorological Observatory, Blue Hill, Mass. (latitude 42°13′ N., longitude 71°07′ W.; height above sea level, 195 meters), will be regularly included in table 2. Table 4, giving the values of the red and yellow components of the direct solar radiation at this same station, also will be published regularly, beginning with this number.

Table 1 shows that solar radiation intensities averaged above normal for September at all three Weather Bureau stations.

Table 2 shows an excess in the total solar radiation received on a normal surface at all stations for which normals have been computed except Washington, Lincoln, Chicago, New York, and Pittsburgh. It seems significant that the larger cities show a deficiency in the total radiation received coincident with an increased activity in manufacturing, while the smaller cities show an excess in the radiation received.

In table 3 the turbidity values show a clearing of the sky up to noon and a gradual increase in dustiness during the afternoon. On the 19th the sky gradually cleared up to noon after which cumuli formed.

Polarization measurements made on 4 days at Washington give a mean of 56 percent with a maximum of 64 percent on the 18th. At Madison, measurements made on 9 days give a mean of 68 percent with a maximum of 77 percent on the 27th. These values are slightly above normal for September at both stations.

TABLE 1.—*Solar radiation intensities during September 1933*

[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[1]	2.0	3.0	4.0	5.0	e.
	mm	*cal*	*cal*	*cal*	*cal*	*cal*	*cal*	*cal*	*cal*	*cal*	*mm*
Sept. 6	13.13					1.24	0.92				10.97
Sept. 7	14.10					1.34					17.37
Sept. 8	19.23					0.97					19.89
Sept. 18	12.24			1.00	1.17	1.41					9.14
Sept. 19	10.21	0.68	0.83	1.01	1.21	1.43					9.83
Sept. 25	14.60					1.33	1.28	1.24			11.81
Sept. 30	10.59			.80	1.00	1.16					9.14
Means		(.68)	(.83)	.94	1.13	1.28	(1.10)	(1.24)			
Departures		−.01	+.08	+.07	+.09	−.03	+.04	+.39			

TABLE 1.—*Solar radiation intensities during September 1933*—Con.

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

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	1.0[1]	2.0	3.0	4.0	5.0	e.
	mm	*cal*	*cal*	*cal*	*cal*	*cal*	*cal*	*cal*	*cal*	*cal*	*mm*
Sept. 5	12.24			0.90	1.06	1.34					16.20
Sept. 7	14.10	0.38	0.48	.64	.88	1.24					17.96
Sept. 8	14.10	.70	.79	.98	1.14	1.39					12.24
Sept. 12	8.81				1.00						9.14
Sept. 18	7.87	1.00	1.08	1.22	1.33	1.48					7.29
Sept. 19	17.37					1.41	1.30				15.11
Sept. 20	5.79	.91	1.01	1.15							7.57
Sept. 21	7.29	1.02	1.11	1.23	1.37		1.20				7.87
Sept. 23	10.21		.84	.98							12.24
Sept. 27	21.26				1.36	1.55	1.32				5.36
Sept. 28	6.50						1.31	1.12			9.47
Sept. 29	6.27		1.00	1.16	1.30		1.25				6.27
Means		.80	.90	1.03	1.18	1.40	1.27	(1.12)			
Departures		−.06	±.00	+.01	+.03	+.02	+.10	+.10			

LINCOLN, NEBR.

Sept. 1	15.11			0.90	1.08						17.96
Sept. 4	16.79	0.52	0.62	.80	1.04	1.28					16.20
Sept. 5	16.20		.83	.97	1.16		1.17	0.95	0.82	0.73	15.65
Sept. 6	15.11		.91	1.06	1.22	1.42	1.11	.93	.76	.65	12.24
Sept. 7	17.96		.85	.99	1.11			.92	.75	.60	16.20
Sept. 8	16.20	.71	.82	.97	1.17						14.60
Sept. 16	10.97	.94	1.09	1.20	1.34	1.56					7.29
Sept. 18	15.65	.84	.98	1.12	1.20			.93	.77	.65	19.89
Sept. 19	9.47	.53	.76	1.01	1.27	1.57	1.23	1.02	.89	.74	6.50
Sept. 20	6.76	.91	1.01	1.14	1.29	1.57	1.26	1.09	.95	.83	6.76
Sept. 21	8.18			1.04	1.12						12.24
Sept. 22	7.87					1.36	1.17	.97	.83	.70	7.57
Sept. 27	6.02	.81	.86	1.09	1.23	1.46	1.27	1.13	1.00	.91	9.47
Sept. 29	9.83		1.01	1.14	1.31	1.47					6.27
Sept. 30	16.20						1.21	1.06	.92	.80	
Means		.75	.89	1.03	1.20	1.46	1.20	1.00	.85	.80	
Departures		+.06	+.08	+.09	+.09	+.06	+.05	+.03	±.02	±.00	

BLUE HILL, MASS.

Sept. 2	13.6			1.03	1.11	1.30	1.10	0.78			11.0
Sept. 9	18.0						1.24				15.1
Sept. 11	5.6				1.27	1.43					5.0
Sept. 12	6.3				1.33	1.50	1.29				5.6
Sept. 13	6.8					1.46					6.5
Sept. 18	10.6			1.01	1.13	1.47	1.08	.96			8.5
Sept. 19	8.2			1.02			1.25				7.9
Sept. 22	9.8			1.05							9.1
Sept. 23	8.8			1.11		1.51					7.9
Sept. 27	16.2				1.06						17.4
Sept. 30[1]	7.9			1.14	1.24		1.14				10.6
Means				1.06	1.19	1.44	1.18	(.87)			

[1] Extrapolated.

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	Riverside	Blue Hill
	Gram calories per square centimeter														
1933	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Sept. 3	427	445	519	392	310	584	275	232	557	423	336	464	431	542	324
Sept. 10	176	196	247	168	267	579	190	218	468	247	365	556	406	489	328
Sept. 17	437	398	487	378	315	565	321	142	438	353	395	487	399	512	469
Sept. 24	392	240	409	242	343	495	308	134	386	272	428	470	397	373	289
	Departures from weekly normals														
Sept. 3	+40	+66	+59	+67	−13	+40	−63	------	+34	+82	−6	−2	------	------	------
Sept. 10	−193	−148	−175	−133	−45	+61	−149	------	−34	−59	+21	+84	------	------	------
Sept. 17	+79	+54	+72	+87	+16	+75	−29	------	+48	+52	+17	+11	------	------	------
Sept. 24	+40	−51	+29	−21	−39	+55	−26	------	+74	−34	+49	+7	------	------	------
	Accumulated departures on September 30														
	+6,944	−1,869	+3,885	+12,397	+8,099	+8,715	−1,666	------	+707	+9,226	------	−4,102	------	------	------

TABLE 3.—*Solar radiation measurements, and determinations of atmospheric-turbidity factor, β, Washington, D.C., September 1933*

[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: Skylight polarization, P., clouds, etc.
1933										
Sept. 7	°	′		*gr. cal.*	*gr. cal.*	*gr. cal.*				
0:33a	56	19	1.20	1.283	*0.870*	0.690	0.110			
0:30a	56	30	1.20	1.243	0.875	*0.695*	0.140	------	292	
Sept. 18										
4:44a	18	19	3.16	0.919	*0.691*	0.569	0.075			
4:36a	19	51	2.93	1.011	*0.696*	0.572	0.055			
4:17a	23	35	2.49	1.097	0.754	*0.590*	0.040			
4:12a	24	26	2.40	1.112	0.757	*0.593*	0.035			
3:28a	32	37	1.86	1.198	*0.856*	0.653	0.025	6	605	P=64.0%
3:41a	40	40	1.53	1.348	*0.884*	0.761	0.085			
2:38a	41	12	1.52	1.348	0.885	*0.761*	0.082			
0:38a	55	40	1.20	1.380	0.897	*0.758*	0.080			
0:34a	55	54	1.20	1.361	*0.900*	0.761	0.090			
Sept. 19										
4:54a	14	30	3.94	0.848	*0.680*	0.532	0.065			
4:47a	15	38	3.68	0.894	0.683	*0.555*	0.055			
4:27a	19	40	2.95	1.018	0.744	*0.590*	0.040			
4:22a	20	30	2.84	1.045	*0.747*	0.593	0.038			
4:09a	22	58	2.55	1.110	*0.775*	0.614	0.030			
4:05a	23	44	2.48	1.125	0.778	*0.619*	0.032	6	485	P=59.8%
2:19a	41	44	1.50	1.299	0.911	*0.611*	0.020			
2:14a	42	18	1.48	1.259	*0.912*	0.614	0.020			

TABLE 4.—*Solar radiation measurements obtained at the Blue Hill Meteorological Observatory of Harvard University, during September 1933.*

Date and Solar Hour Angle.	Solar altitude. *h*.		Air mass. *m*	I_m	I_y	I_r	Sky conditions;—(clouds, haze (hz), smoke (smk), visibility (v, international scale), wind, etc.).
Sept. 2	°	′		*gr. cal.*	*gr. cal.*	*gr. cal.*	
3:27, a.m.	33	08	1.73	1.142	0.833	0.653	Few Ci; hz 6°–8°; v 6; W=2
3:02, a.m.	37	11	1.65	1.185	0.858	0.670	
1:18, a.m.	51	47	1.27	1.256	0.894	0.698	Few Ci; hz to 6°; v 7; W-1
0:23, p.m.	55	36	1.21	1.207	0.847	0.675	
3:14, p.m.	35	41	1.71	1.082	0.797	0.634	2 Cu, few Ci; hz to 4°; v 6–7
4:49, p.m.	18	26	3.14	0.720	0.578	0.461	6 Ci, few Cu; v 6–7; SW-2.
Sept. 12							
3:47, a.m.	27	00	2.19	1.310	0.961	0.767	
3:01, a.m.	34	40	1.73	1.358	0.987	0.784	Few Ci in SE, Acu in SE; v 6–8; W-2.
0:20, a.m.	51	42	1.27	1.444	1.013	0.797	Few Ci; lt hz; v 9; WSW-4.
1:34, p.m.	46	35	1.38	1.384	0.974	0.774	Few Ci; lt hz; v 9–10; W-4.
Sept. 13							
1:06, p.m.	48	53	1.34	1.401	0.960	0.752	7 Ci; v 9; W-3.
Sept. 19							
4:12, a.m.	20	45	2.81	1.034	0.776	0.634	1 Acu; lt hz; v 8–9; W-5.
Sept. 22							
4:07, a.m.	20	17	2.86	1.060	0.784	0.629	1 Acu; lt hz; v 8; WNW-4.
Sept. 23							
4:04, a.m.	21	00	2.77	1.164	0.875	0.703	1 Acu in SW, few in NE; lt hz; v 8–9; W-3.
1:30, a.m.	43	06	1.45	1.409	1.009	0.784	2 Ci, Cicu; lt hz; v 9; WNW-3.
Sept. 27							
2:43, p.m.	32	49	1.84	0.926	0.672	0.500	9 Cist, 1 Acu; v 7; S-4.
Sept. 30							
2:19, a.m.	34	56	1.74	1.264	0.908	0.703	1 Ci, Cist; hz to 3°; v 6–8; WNW-2
0:55, a.m.	43	16	1.45	1.246	0.890	0.690	Few Cu, Acu, in E; hz to 3°–4°; v 8; S-2
0:51, p.m.	43	25	1.45	1.295	0.886	0.694	3 Cu, Frcu; lt hz; v 8–9; SSW-2.
2:58, p.m.	29	40	2.02	1.130	0.819	0.632	Few Cu; lt hz; v 9; S-3.

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, 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
1933	*h*	*m*	°	°	°			
Sept. 1 (Naval Observatory)	------			No spots		------	------	------
Sept. 2 (Naval Observatory)	14	6		No spots		------	------	------
Sept. 3 (Naval Observatory)	12	21		No spots		------	------	------
Sept. 4 (Perkins Observatory)	11	30		No spots		------	------	------
Sept. 5 (Naval Observatory)	11	24		No spots		------	------	------
Sept. 6 (Naval Observatory)	13	42	+18.0	48.6	−12.0	------	93	93
Sept. 7 (Naval Observatory)	11	29	+31.0	49.6	−11.0	------	77	77
Sept. 8 (Naval Observatory)	12	10	+43.0	48.0	−10.5	------	62	62
Sept. 9 (Naval Observatory)	11	2	+56.5	48.9	−10.5	------	40	40
Sept. 10 (Naval Observatory)	11	34	+70.0	48.9	−10.5	------	12	12
Sept. 11 (Naval Observatory)	11	15		No spots		------	------	------
Sept. 12 (Mount Wilson)	9	40		No spots		------	------	------
Sept. 13 (Mount Wilson)	10	1		No spots		------	------	------
Sept. 14 (Mount Wilson)	9	26		No spots		------	------	------
Sept. 15 (Mount Wilson)	9	52		No spots		------	------	------
Sept. 16 (Perkins Observatory)	14	25		No spots		------	------	------
Sept. 17 (Naval Observatory)	12	2		No spots		------	------	------
Sept. 18 (Naval Observatory)	12	28		No spots		------	------	------
Sept. 19 (Naval Observatory)	12	29		No spots		------	------	------
Sept. 20 (Naval Observatory)	12	17		No spots		------	------	------
Sept. 21 (Naval Observatory)	14	22	−13.0	179.2	+14.0	------	25	25
Sept. 22 (Naval Observatory)	13	10	−1.0	178.6	+13.0	------	15	15
Sept. 23 (Naval Observatory)	11	27	+13.0	180.4	+14.0	15	------	15
Sept. 24 (Naval Observatory)	12	34		No spots		------	------	------
Sept. 25 (Naval Observatory)	11	35		No spots		------	------	------
Sept. 26 (Naval Observatory)	14	23		No spots		------	------	------
Sept. 27 (Naval Observatory)	11	12		No spots		------	------	------
Sept. 28 (Naval Observatory)	12	17	+24.0	124.9	−1.0	------	19	19
Sept. 29 (Naval Observatory)	11	1	+37.0	125.4	−1.5	------	15	15
Sept. 30 (Naval Observatory)	11	42	+49.0	123.9	−1.0	------	12	12
Mean daily area for September	------		------	------	------	------	------	13

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR SEPTEMBER 1933

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

[Observations furnished through the courtesy of Prof. W. Brunner, Eidgen. Sternwarte, Switzerland]

September 1933	Relative numbers	September 1933	Relative numbers	September 1933	Relative numbers
1	0	11	0	21	7
2	7	12	0	22	------
3	7	13	0	23	11
4	7	14	0	24	8
5	0	15	0	25	0
6	*Mc* 15	16	0	26	0
7	19	17	0	27	0
8	12	18	0	28	11
9	11	19	------	29	12
10	7	20	0	30	8

c=New formation of a center activity; *M*, in the central zone.

Mean: 28 days=5.1.