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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:

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SOLAR OBSERVATIONS

SOLAR RADIATION MEASUREMENTS DURING AUGUST, 1932

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.

Table 1 shows that solar radiation intensities averaged well above normal values for August at all three stations at which normal incidence measurements are made.

Table 2 shows an excess in the total solar radiation received on a horizontal surface at Washington, Chicago, New York, Fresno, Pittsburgh, and Miami and a deficiency at all other stations for which normals have been computed. The excess in the larger manufacturing cities of New York, Chicago, and Pittsburgh is well marked and indicates that the diminution in the amount of smoke emission due to less manufacturing has permitted an appreciable increase in the amount of radiation received at the ground.

Table 3 shows diminished turbidity for the month as would be expected from the increase in radiation at Washington.

Polarization measurements made at Washington on nine days give a mean of 60 per cent with a maximum of 65 per cent on the 15th. At Madison, measurements made on eight days give a mean of 59 per cent with a maximum of 61 per cent on the 3d. These are above the corresponding August values for Washington. At Madison the values are slightly below the corresponding averages.

On the afternoon of the eclipse of August 31, Mr. George Grimminger of the Aerological Division took observations of the total solar radiation at normal incidence simultaneously with measurements of the red component of solar radiation, also at normal incidence. The results show a slight increase in the proportion of red radiation to the total. Dr. James E. Ives, of the United States Public Health Service, measured the ultra-violet receipt during the time of the eclipse and his results show a decided decrease in the proportion of ultra-violet to the total. As the center of the sun's disk is richer in ultra-violet than the edge and the edge richer than the center in the longer wave lengths, these results were to be expected. The red radiation comprises a large proportion of the total

solar radiation, while the ultra-violet comprises but a small percentage of the total, so that one would expect a much larger decrease in the ultra-violet receipt than increase in the red radiation. Detailed information concerning the observations of ultra-violet and red radiation will be published by the United States Public Health Service in the near future.

TABLE 1.—*Solar radiation intensities during August, 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	*1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Aug. 4	15.11					1.42	1.19				13.61
Aug. 5	15.11	0.75	0.86	1.00	1.19	1.42					11.81
Aug. 9	14.10	0.62	0.73	0.87	1.08	1.32					12.68
Aug. 12	9.83			0.75							10.21
Aug. 13	9.83	0.77	0.94	1.05	1.23	1.45					9.83
Aug. 15	14.60	0.77	0.88	0.98	1.07	1.31					10.97
Aug. 19	12.24					1.43					9.83
Aug. 23	11.81					1.22					9.83
Aug. 24	16.79					1.06					11.81
Aug. 25	13.61	0.57	0.66	0.81	1.02	1.27					10.97
Aug. 26	14.60	0.62	0.70	0.90	1.10	1.32					10.97
Aug. 31	17.96		0.61	0.78	1.00	1.25					16.20
Means		0.68	0.77	0.89	1.10	1.32	(1.19)				
Departures		+0.05	+0.09	+0.13	+0.07	+0.09	+0.16				

*Extrapolated.

TABLE 1.—*Solar radiation intensities during August, 1932*—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	1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Aug. 3	13.13					1.44	1.20	1.02	0.91		10.21
Aug. 5	15.65					1.38	1.21	1.10			11.81
Aug. 8	8.81					1.39					8.48
Aug. 10	13.61		0.66	0.84	1.06	1.32					14.10
Aug. 13	12.68				1.03						9.47
Aug. 19	10.59					1.45					9.14
Aug. 20	10.97				1.20	1.44					10.21
Aug. 22	13.61						1.09				11.81
Aug. 24	11.81				1.06	1.31					13.13
Aug. 30	18.59			0.95	1.12						18.59
Aug. 31	19.23			0.99	1.14						17.96
Means			(0.66)	0.93	1.10	1.39	1.17	(1.06)	(0.91)		
Departures			−0.16	±0.00	+0.01	+0.08	+0.09	+0.19	+0.09		

Lincoln, Nebr.

Aug. 2	17.37					1.42	1.21	1.04	0.88	0.78	17.37
Aug. 3	13.61	0.82	0.92	1.04	1.20	1.50	1.14	0.98	0.82	0.72	13.13
Aug. 5	14.10					1.36	1.11				13.61
Aug. 8	9.14	0.74	0.84	0.98							10.97
Aug. 9	14.10			1.01	1.13	1.33					15.65
Aug. 18	10.21	0.78	0.87	1.01	1.19	1.45	1.23	1.02	0.92	0.86	9.83
Aug. 20	10.97		0.77	0.92	1.07	1.33	1.09	0.92	0.73	0.67	12.63
Aug. 26	12.68					1.34	1.14	0.96	0.83	0.72	12.24
Means		0.78	0.85	0.99	1.15	1.39	1.15	0.98	0.84	0.75	
Departures		+0.10	+0.07	+0.09	+0.07	+0.08	+0.07	+0.09	+0.08	+0.06	

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 cubic centimeter												
1932	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
July 30	517	449	398	417	509	676	489	164	650	393	260	485	202
Aug. 6	586	433	532	418	457	678	443	244	569	403	310	556	296
Aug. 13	554	425	414	502	500	652	485	294	613	274	311	530	325
Aug. 20	593	470	499	476	492	632	474	216	547	332	186	474	289
Aug. 27	452	383	434	353	400	606	354	228	480	252	[1] 254	482	329
	Departures from weekly normals												
July 30	+59	−14	−116	+37	+117	+60	+14		+61	+10	−156	−69	
Aug. 6	+142	−25	+39	+53	+94	+76	+20		−29	+40	−92	+20	
Aug. 13	+119	−16	−70	+128	+158	+68	+95		+19	−75	−100	+20	
Aug. 20	+179	+32	+6	+103	+64	+76	+123		−25	−83	−202	−26	
Aug. 27	+35	−23	−22	+5	+73	+71	+20		−67	−107	−189	−4	
	Accumulated departures on Sept. 2, 1932												
	+7,070	+401	−2,532	+13,939	+17,656	+7,963	+5,278		−6,806	+1,703		−2,655	

[1] 6-day mean.

TABLE 3.—*Solar radiation measurements and determinations of atmospheric turbidity factor (β), Washington, D. C., August, 1932*

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.
Aug. 4									
0:52 p	65–30	1.09	1.413	*0.950*	0.744	0.075		231	Some interference from smoke and gas of experimental P_2O_5 plant.
0:57 p	64–55	1.09	1.390	.954	*.747*	.090			
3:12 p	43–04	1.46	1.240	.909	.695	.080			
3:15 p	42–29	1.48	1.290	*.912*	.701	.070			
4:26 p	28–50	2.07	1.149	.783	*.604*	.040	5		P=64.
4:48 p	24–32	2.40	1.016	.773	*.586*	.070			
4:52 p	23–45	2.48	1.092	*.777*	.592	.040			
Aug. 5									
6:00 a	10–32	5.35	.720	*.577*	.478	.055		402	
5:56 a	11–18	5.00	.753	.589	*.489*	.055			
5:36 a	17–00	3.39	.948	*.702*	.574	.060			
5:21 a	18–00	3.21	.962	.709	*.580*	.060			
4:48 a	24–23	2.41	1.102	*.791*	.614	.055			
4:42 a	25–33	2.31	1.114	.800	*.628*	.055	4		P=62.
3:11 a	43–05	1.46	1.254	*.870*	.689	.085			
3:06 a	44–02	1.44	1.270	.882	*.697*	.085			Clouds coming up.
Aug. 9									
5:29 a	15–47	3.65	.780	*.586*	.489	.070		231	
5:23 a	16–52	3.42	.811	.601	*.505*	.080			
4:43 a	24–38	2.39	1.000	.726	*.537*	.055			
4:39 a	25–25	2.31	1.010	*.735*	.544	.060	4		P=62.
3:30 a	38–46	1.59	1.180	*.832*	.655	.095			
3:26 a	39–32	1.57	1.188	.830	*.661*	.095			
0:45 a	64–50	1.10	1.248	.864	*.668*	.140			
0:42 a	65–02	1.10	1.266	*.868*	.674	.125			Clouds coming up.
Aug. 12									
5:24 a	16–12	3.55	.684	*.550*	.448	.110		441	Rather thin haze or incipient clouds all morning.
5:20 a	16–50	3.44	.719	.556	*.454*	.095			
5:04 a	20–04	2.89	.722	.561	*.478*	.145			
5:00 a	20–51	2.80	.765	*.568*	.486	.135			
Aug. 13									
5:20 a	16–43	3.45	.980	*.725*	.583	.045		284	
5:16 a	17–29	3.30	1.021	.732	*.589*	.040			
4:51 a	22–19	2.62	1.129	.790	*.629*	.035			
4:48 a	22–55	2.56	1.129	*.803*	.635	.040			
3:58 a	32–39	1.86	1.250	*.833*	.689	.050	5		P=62.
3:54 a	33–24	1.81	1.260	.842	*.698*	.040			
3:22 a	39–31	1.57	1.310	.871	*.697*	.045			
3:18 a	40–27	1.54	1.311	*.877*	.702	.050			
0:54 a	62–55	1.12	1.390	*.939*	.747	.090			
0:50 a	63–16	1.12	1.420	.945	*.753*	.080			Clouds to west
Aug. 15									
5:07 a	18–56	3.06	0.932	*0.659*	0.531	0.060		624	
5:04 a	19–32	2.98	.979	.667	*.535*	.040			
4:40 a	24–12	2.43	.986	.722	*.571*	.080			
4:37 a	24–47	2.37	.986	*.727*	*.577*	.085	4		P=65.
3:14 a	40–42	1.53	1.166	*.795*	.649	.100			
3:11 a	41–15	1.52	1.166	.801	*.653*	.100			
0:39 a	63–39	1.11	1.260	.867	*.664*	.100			
0:36 a	63–51	1.11	1.258	*.873*	.668	.105			Cumuli.
Aug. 19									
1:40 a	56–18	1.20	1.384	*.942*	.635	.070		231	
1:37 a	56–44	1.19	1.394	.945	*.738*	.070			Clouds.
Aug. 23									
3:28 a	36–24	1.68	1.095	*.756*	.597	.090	4	626	P=54.
3:26 a	36–48	1.67	1.097	.759	*.601*	.090			
2:27 a	47–14	1.36	1.137	.794	*.616*	.135			
2:22 a	48–06	1.34	1.149	*.700*	.623	.135			Cumuli.
Aug. 25									
5:23 a	13–50	4.13	.652	*.494*	.434	.095		239	
4:59 a	18–30	3.13	.777	.583	.493	.105			
4:54 a	19–30	2.98	.816	*.589*	.501	.095			
4:38 a	22–38	2.59	.905	*.634*	.528	.080			
4:35 a	23–10	2.54	.914	.638	*.531*	.080			
4:04 a	29–10	2.05	.987	.708	*.549*	.065			
4:00 a	29–56	2.00	1.012	*.715*	.552	.060	3		P=53.
2:52 a	42–30	1.48	1.024	.789	*.559*	.095			
2:40 a	44–36	1.42	1.114	.803	*.562*	.065			
0:43 a	60–16	1.15	1.214	.761	.595	.085			
2:11 p	49–24	1.32	1.140	*.803*	.530	.140			
2:18 p	48–10	1.34	1.130	.797	.626	.140			Stopped by clouds.
Aug. 26									
5:07 a	16–45	3.45	.821	*.608*	.505	.080		438	
5:04 a	17–20	3.33	.839	.613	*.508*	.070			
4:44 a	21–13	2.75	.954	.682	*.556*	.070			
4:40 a	22–00	2.65	.961	*.688*	.561	.070			
3:44 a	32–14	1.85	1.134	*.750*	.625	.080	4		P=57.
3:40 a	33–50	1.79	1.144	.761	*.621*	.075			
1:54 a	51–53	1.27	1.250	.837	*.662*	.090			
1:49 a	52–29	1.26	1.276	*.840*	.664	.080			
0:29 a	60–41	1.14	1.277	.843	*.664*	.090			
0:26 a	60–51	1.14	1.285	*.845*	.652	.080			
2:07 p	49–47	1.31	1.260	*.872*	.673	.090			
2:12 p	48–59	1.32	1.211	.855	*.673*	.120			Clouds.

TABLE 3.—*Solar radiation measurements and determinations of atmospheric turbidity factor (β), Washington, D. C., August, 1932*—Continued

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.
Aug. 31									
3:24 p	35–17	1.73	.101*		.058	.135			89.5% (partial eclipse).
4:30 p	22–03	2.65	.800		.493	.120			

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*	°	°	°			
Aug. 1 (Naval Observatory)	11	24	−11.0	274.2	−10.0	154	------	154
Aug. 2 (Mount Wilson)	12	20	+2.0	273.4	−9.0	208	------	208
Aug. 3 (Mount Wilson)	9	45	+15.0	274.5	−9.5	200	------	200
Aug. 4 (Naval Observatory)	11	18	+29.0	274.5	−10.0	154	------	154
Aug. 5 (Naval Observatory)	11	26	+42.0	274.2	−10.0	154	------	154
Aug. 6 (Naval Observatory)	11	13	+57.0	276.1	−10.0	154	------	154
Aug. 7 (Naval Observatory)	13	44	+70.0	274.5	−10.0	154	------	154
Aug. 8 (Naval Observatory)	11	10	+85.0	277.7	−10.0	154	------	154
Aug. 9 (Naval Observatory)	11	11	No spots			------	------	------
Aug. 10 (Naval Observatory)	12	25	+65.0	230.6	−1.0	------	25	25
Aug. 11 (Naval Observatory)	11	5	+79.0	232.1	−1.0	------	25	25
Aug. 12 (Naval Observatory)	11	42	No spots			------	------	------
Aug. 13 (Naval Observatory)	11	19	No spots			------	------	------
Aug. 14 (Naval Observatory)	12	32	No spots			------	------	------
Aug. 15 (Naval Observatory)	10	42	No spots			------	------	------
Aug. 16 (Naval Observatory)	10	37	No spots			------	------	------
Aug. 17 (Naval Observatory)	14	6	No spots			------	------	------
Aug. 18 (Mount Wilson)	11	30	No spots			------	------	------
Aug. 19 (Naval Observatory)	10	46	No spots			------	------	------
Aug. 20 (Naval Observatory)	13	57	No spots			------	------	------
Aug. 21 (Naval Observatory)	10	8	No spots			------	------	------
Aug. 22 (Naval Observatory)	10	32	No spots			------	------	------
Aug. 23 (Naval Observatory)	11	26	−80.0	274.3	−9.0	62	------	62
Aug. 24 (Naval Observatory)	12	13	−66.0	274.7	−9.0	62	------	62
Aug. 25 (Naval Observatory)	11	30	−53.0	274.8	−9.0	62	------	------
			+3.0	330.8	−7.0	------	93	155
Aug. 26 (Naval Observatory)	12	29	−39.0	275.1	−9.0	62	------	------
			+18.0	332.1	−7.0	------	93	155
Aug. 27 (Naval Observatory)	11	42	−26.0	275.3	−9.0	46	------	------
			+31.0	332.3	−7.0	------	77	123
Aug. 28 (Naval Observatory)	13	54	−11.0	275.9	−9.0	46	------	------
			+48.0	334.9	−7.0	31	------	77
Aug. 29 (Naval Observatory)	11	55	+2.0	276.8	−9.0	31	------	31
Aug. 30 (Naval Observatory)	13	40	+16.0	276.6	−9.0	24	------	24
Aug. 31 (Naval Observatory)	10	38	+28.0	277.1	−9.0	15	------	15
Mean daily area for August								67

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR AUGUST, 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]

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

Mean: 30 days=6.7.

a=Passage of an average-sized group through the central meridian.
b=Passage of a large group or spot 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.