RECENT PAPERS BEARING ON METEOROLOGY AND SEISMOLOGY.

C. F. TALMAN, Professor in Charge of Library.

The following titles have been selected from the contents of the periodicals and serials recently received in the Library of the Weather Bureau. The titles selected are of papers and other communications bearing on meteorology and cognate branches of science. This is not a complete index of all the journals from which it has been compiled. It shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau.

Astrophysical journal. Chicago. v. 50. July, 1919.
Meggers, W. F., & Peters, C. G. Measurements on the index of refraction of air for wave-lengths from 2218A to 9000A. p. 56–71.

Franklin Institute. Journal. Philadelphia. v. 188. 1919.
Jones, Loyd A. The low visibility phase of protective coloration. p. 363–387; 507–533. (Sept., Oct.). [Discusses weather factors and describes a visibility-meter].
Humphreys, W[illiam] J[ackson]. Optics of the air. p. 433–488. (Oct.)
Aeronautics Staff, U. S. N. Air-speed indicators for dirigibles. p. 535–544. (Oct.)

Geographical review. New York. v. 8. August, 1919.
Taylor, Griffith. The settlement of tropical Australia. p. 84–115. [Part of "Geographical factors controlling the settlement of tropical Australia" (Queensland Geogr. Journ.). Includes extensive discussion of climate.]

London, Edinburgh, and Dublin philosophical magazine. London. v. 38. September, 1919.
Rayleigh. The traveling cyclone. p. 420–424. [Abstract, p. 644, above.]

Physical review. Lancaster. v. 14. October, 1919.
Stewart, C. W. Propagation of sound in an irregular atmosphere. p. 376–378.

Popular science monthly. New York. v. 95. October, 1919.
Jostling the clouds to change the weather. Rain-makers, hail-preventers and their strange devices. p. 72–74.

Royal astronomical society of Canada. Journal. Toronto. v. 13. July–August, 1919.
Stupart, Frederic. The variability of corresponding seasons in different years. p. 259–263.

Science. New York. v. 50. 1919.
Knowlton, A. A. An unusual mirage. p. 328. (Oct. 3.)
Brooks, Charles F. Agricultural meteorology. p. 350–351. (Oct. 10.) [Review of recent work in the U. S.]
Talman, C[harles] F[itzhugh] & *others*. Snow rollers. p. 371–372. (Oct. 17.)
Brooks, Charles F. The trans-Atlantic flights and ocean weather maps. p. 374–375. (Oct. 17.)

Scientific American. New York. v. 121. October 4, 1919.
Keeping track of winds for the airman. p. 339.

Symons's meteorological magazine. London. v. 54. September, 1919.
Gold, [E.] Unification of the British meteorological services. p. 86–88. [See pp. 650–651, above.]
Ridpath, C. H. E. Notes on the climate of Mesopotamia. p. 90–91.

Belgium. Observatoire royale. Annales. Bruxelles. Tome 6.
Somville, O. Contribution à l'étude des mouvements microsismiques. p. 1–48. (fasc. 1. 1914.)
Somville, O. De la différence de phase entre les mouvements du pendule et du galvanomètre dans l'enregistrement des ondes sismiques par la méthode électromagnétique. p. 143–159. (Fasc. 2. 1918.)

Revue du ciel. Bourges. 4me. année. Octobre, 1919.
Bouant, Émile. Les feux follets. p. 705–707.

Secretaría de Agricultura, commercio y trabajo. Bolletin mensual. Mexico. Tome 4. Enero–febrero, 1919.
Bustamante, Octavio. Las lluvias en los años de 1917 y 1918. p. 17–20.

Egatea. Porto Alegre. v. 5. Agosto, 1919.
Coussirat de Araujo, L. Invernos frios e invernos quentes. p. 78–80.

Astronomische Nachrichten. Kiel. Band 203. no. 14. 1916.
Stentzel, A. Die neue Dämmerungsanomalie. Zweite Mitteilung. p. 223–230.

Prussia. Königlich preussisches meteorologisches Institut. Abhandlungen. Berlin. Band 5. 1917.
Dorno, C. Beobachtungen der Dämmerung und von Ringerscheinungen um die Sonne 1911–bis 1917. p. 1–94.

Società meteorologica italiana. Bollettino bimensuale. v. 37. Dicembre, 1917; gennaio–maggio, 1918.
Crestani, Giuseppe. Le cappe. Nota 2. p. 1–9.
Gicres. La legge di Buys-Ballot e il vento in Italia. p. 9–10.
Toller, Francesco. L'aeronavigazione e le correnti aeree. p. 17–32.
Negro, Carlo. Di alcuni aloni osservati in Torino nel 1917. p. 10–16.

SPECIAL OBSERVATIONS.

SOLAR AND SKY RADIATION MEASUREMENTS DURING SEPTEMBER, 1919.

By HERBERT H. KIMBALL, Professor of Meteorology, in charge.

[Dated: Solar Radiation Investigations Section, Washington, Oct. 30, 1919.]

For a description of instrumental exposures and an account of the methods of obtaining and reducing the measurements, the reader is referred to the REVIEW for January, 1919, **47**:4.

The monthly means and departures from normal in Table 1 show that radiation measurements averaged close to September normal values at Washington and Santa Fe, slightly above normal at Madison, and slightly below at Lincoln.

Table 3 shows only slight departures from the normal amount of radiation for the month at the three stations having continuously recording pyrheliometers. At Washington, the Leeds and Northrup recorder heretofore used was replaced by a Callendar recorder on September 27, necessitating a redetermination of the reduction factor for the pyrheliometer.

The skylight polarization measurements made at Washington on 8 days give a mean of 59 per cent, with a maximum of 67 per cent on the 25th. At Madison, measurements made on 12 days give a mean of 67 per cent, with a maximum of 73 per cent on the 12th. These are average values for September.

TABLE 1.—*Solar radiation intensities during September, 1919.*

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

Washington, D. C.

Date.	Sun's zenith distance.									
	0.0°	48.3°	60.0°	66.5°	70.7°	73.6°	75.7°	77.4°	78.7°	79.8°
	Air mass.									
	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5
A. M.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Sept. 3	1.19	1.06	0.94	0.82	0.68	0.61	0.56	0.50	0.44	0.38
4		1.02	0.92	0.83	0.74	0.67	0.61			
8		0.85	0.73	0.64						
12	1.37	1.26	1.18	1.04	0.93	0.89	0.83	0.77	0.71	
13		1.28	1.17	1.09	1.05	0.98	0.92	0.85		
24		1.24	1.09	0.99	0.93	0.87	0.81			
25	1.43	1.30	1.18	1.06	0.98	0.91	0.84			
26		1.11	0.93	0.77	0.65	0.59	0.54			
27		1.32	1.15	1.02	0.90	0.81	0.76			
Monthly means	**1.33**	**1.16**	**1.03**	**0.92**	**0.86**	**0.79**	**0.73**	**0.71**	**(0.58)**	**(0.38)**
Departure from 11-year normal	**+0.01**	**−0.04**	**−0.04**	**−0.06**	**−0.02**	**±0.00**	**+0.01**	**+0.05**	**−0.06**	**−0.22**
P. M.										
Sept. 16		0.96	0.84				0.67		0.43	0.38
18		1.12	0.53							
24		1.30	1.06							
25		1.30	1.18	1.07	0.98	0.91	0.85	0.80	0.73	0.66
26		1.29	1.17	1.07	0.99	0.91	0.71	0.63		
27		1.34	1.11	1.01	0.91	0.83	0.77	0.71	0.65	
Monthly means		**1.22**	**0.98**	**1.05**	**0.96**	**0.88**	**0.75**	**0.71**	**0.60**	**(0.52)**
Departure from 11-year normal		**+0.02**	**−0.03**	**+0.09**	**+0.08**	**+0.08**	**+0.01**	**−0.01**	**−0.07**	**−0.07**

Madison, Wis.

A. M.										
Sept. 1		1.27	1.12	1.02		0.90		0.81		
4		1.29								
8		1.17								
11	[1] 1.48	1.35	1.22	1.11	1.03	0.97	0.92	0.86	0.81	0.78
12		1.40		1.21	1.17	1.13	1.08	1.04	0.99	0.95
15	[1] 1.46	1.33		1.13						
16	[1] 1.45	1.33	1.24	1.15	1.07	0.98	0.92			0.82
22	[1] 1.51	1.41	1.32	1.24	1.16	1.09	1.02	0.95	0.94	0.87
23		1.42	1.29	1.21	1.15	1.08	1.03	0.96	0.90	0.88
24		1.37	1.29	1.17	1.08	1.02	0.97			0.84
27		1.29	1.22							
Monthly means		**1.33**	**1.24**	**1.16**	**1.11**	**1.02**	**0.99**	**0.92**	**0.91**	**0.86**
Departure from 10-year normal		**+0.06**	**+0.07**	**+0.09**	**+0.10**	**+0.07**	**+0.10**	**+0.03**	**+0.01**	
P. M.										
Sept. 4		1.26	1.14	1.02	0.92	0.84				
11		1.38	1.25	1.14						
12		1.32	1.27	1.12	1.06	1.01				
15		1.32	1.19	1.14	1.07	0.98				
16		1.33	1.18	1.05	0.98	0.91				
20		1.09	1.04	0.98	0.89	0.84	0.72			
22		1.41								
23			1.24							
26			1.09							
27		1.28								
Monthly means		**1.30**	**1.18**	**1.08**	**0.98**	**0.92**	**(0.72)**			
Departure from 10-year normal		**+0.04**	**+0.03**	**+0.03**	**−0.02**	**+0.07**	**−0.11**			

[1] Extrapolated and corrected for mean solar distance.

TABLE 2.—*Solar radiation intensities during September, 1919*—Contd.

Lincoln, Nebr.

Date.	Sun's zenith distance.									
	0.0°	48.3°	60.0°	66.5°	70.7°	73.6°	75.7°	77.4°	78.7°	79.8°
	Air mass.									
	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5
A. M.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Sept. 1	[1] 1.24	1.14	1.07	1.01	0.92	0.87	0.81			
6	[1] 1.26	1.11	0.97	0.87	0.78	0.71	0.63	0.56	0.51	
9	[1] 1.29	1.17	1.04	0.95	0.86	0.80	0.76			
11	[1] 1.40	1.26	1.13	1.03	0.95	0.89	0.82			
23		1.31	1.25	1.12	1.06	0.95	0.88			
25	[1] 1.43	1.31	1.21	1.13	1.03	0.95				
26		1.36	1.26	1.17	1.07	0.99				
Monthly means		**1.24**	**1.13**	**1.04**	**0.95**	**0.88**	**0.78**	**(0.56)**	**(0.51)**	
Departure from 6-year normal		**−0.04**	**−0.04**	**−0.03**	**−0.03**	**−0.02**	**−0.04**	**−0.19**	**−0.21**	
P. M.										
Sept. 5	[1] 1.43		1.02	0.93	0.83	0.74	0.65	0.58	0.53	0.48
9				0.86						
11		1.25	1.11	1.01	0.94	0.88	0.84	0.80	0.75	0.72
23			1.24	1.12	1.02	0.91	0.79			
25		1.30	1.19	1.09	1.00	0.92	0.84	0.77	0.70	0.63
26		1.36	1.23	1.11	1.02	0.94				
Monthly means		**1.30**	**1.16**	**1.02**	**0.96**	**0.88**	**0.78**	**0.72**	**0.66**	**0.61**
Departure from 6-year normal		**+0.02**	**+0.01**	**−0.03**	**±0.00**	**−0.02**	**−0.05**	**−0.04**	**−0.07**	**−0.07**

Santa Fe, N. Mex.

A. M.										
Sept. 5		1.32								
10		1.47	1.36							
11				1.24	1.17	1.09	1.02	0.95	0.89	
17			1.32							
18					0.97			0.81		
25	[1] 1.53	1.45				1.18	1.12	1.06	1.01	0.96
Monthly means		**1.41**	**(1.34)**	**(1.24)**	**(1.07)**	**(1.14)**	**(1.07)**	**0.94**	**(0.95)**	**(0.96)**
Departure from 7-year normal		**+0.01**	**+0.03**	**±0.00**	**−0.08**	**+0.03**	**−0.01**	**−0.06**	**−0.01**	**+0.04**
P. M.										
Sept. 25	[1] 1.53	1.44	1.36	1.29	1.22	1.15	1.09	1.03		
27				1.36						
28				1.34	1.25		1.19	1.14	1.09	
Monthly means		**(1.44)**	**(1.36)**	**1.33**	**(1.24)**	**(1.15)**	**(1.14)**	**(1.08)**	**(1.09)**	
Departure from 7-year normal		**−0.02**	**−0.01**	**+0.02**	**+0.03**	**+0.01**	**+0.04**	**+0.05**	**+0.13**	

[1] Extrapolated and corrected for mean solar distance.

TABLE 2.—*Vapor pressures at pyrheliometric stations on days when solar radiation intensities were measured.*

Washington, D.C.			Madison, Wis.			Lincoln, Nebr.			Santa Fe, N. Mex.		
Date.	8 a.m.	8 p.m.	Date.	8 a.m.	8 p.m.	Date.	8 a.m.	8 p.m.	Date.	8 a.m.	8 p.m.
1919.	*mm.*	*mm.*	1919.	*mm.*	*mm.*	1919.	*mm.*	*mm.*	1919.	*mm.*	*mm.*
Sept. 3	8.81	12.68	Sept. 1	9.83	6.76	Sept. 1	8.48	8.81	Sept. 5	7.57	5.56
4	10.21	14.60	4	10.21	8.81	5	10.59	9.83	10	9.14	7.57
8	16.79	16.79	8	14.60	15.11	6	12.24	11.81	11	9.14	10.59
12	8.48	7.29	11	10.97	7.87	9	16.20	17.37	17	9.47	7.29
13	8.48	10.21	12	7.87	7.57	11	12.68	8.48	18	8.81	8.48
16	13.13	10.21	15	10.97	10.97	23	6.50	8.48	25	5.36	4.95
18	7.87	8.81	16	9.47	9.14	25	6.76	6.76	27	8.48	7.29
24	9.83	11.38	20	14.10	16.79	26	9.14	10.21	28	7.29	5.79
25	9.83	10.21	22	7.87	7.29						
26	7.87	7.87	23	7.04	7.57						
27	7.04	9.47	24	7.29	7.29						
			26	5.36	6.50						
			27	7.87	10.59						

TABLE 3.—*Daily totals and departures of solar and sky radiation during Sept., 1919.*

(Gram-calories per square centimeter of horizontal surface.)

Day of month.	Daily totals.			Departures from normal.			Excess or deficiency since first of month.		
	Washington.	Madison.	Lincoln.	Washington.	Madison.	Lincoln.	Washington.	Madison.	Lincoln.
	cal.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
1	413	532	587	10	134	137	10	134	137
2	322	284	314	− 80	−111	−133	− 70	23	4
3	493	134	377	93	−257	− 68	23	−234	− 64
4	413	486	502	15	98	59	38	−136	− 5
5	399	458	558	3	73	117	41	− 63	112
6	462	480	530	68	99	92	109	36	204
7	419	446	562	27	70	128	136	106	332
8	414	430	553	24	58	122	160	164	454
9	269	169	496	−120	−198	68	40	− 34	522
10	70	251	310	−317	−112	−114	−277	−146	408
11	340	523	553	− 45	165	132	−322	19	540
12	478	499	519	95	145	101	−227	164	641
13	505	417	291	123	67	−122	−104	231	519
14	454	192	486	74	−153	75	− 30	78	594
15	340	466	376	− 38	125	− 32	− 68	203	562
16	404	492	270	28	155	−135	− 40	358	427
17	373	198	152	0	−136	−251	− 40	222	176
18	450	92	48	79	−238	−352	39	− 16	−176
19	212	235	403	−156	− 92	5	−117	−108	−171
20	331	253	501	− 35	− 70	105	−152	−178	− 66
Decade departure							**125**	**− 32**	**−474**
21	343	70	202	− 20	−250	−191	−172	−428	−257
22	120	466	521	−241	150	130	−413	−278	−127
23	37	466	524	−321	153	135	−734	−125	8
24	457	462	504	101	153	118	−633	28	126
25	454	466	526	101	160	142	−532	188	268
26	455	346	540	105	43	159	−427	231	427
27	414	430	103	68	130	−274	−359	361	153
28	393	81	171	50	−215	−203	−309	146	− 50
29	332	94	75	− 7	−199	−295	−316	− 53	−345
30	350	52	126	14	−238	−241	−302	−291	−586
31									
Decade departure							**−150**	**−113**	**−520**
Excess or deficiency since first of year. gr.-cal.							**−4999**	**−3657**	**−2534**
Excess or deficiency since first of year. per cent.							**−4.8**	**−3.5**	**−2.1**

MEASUREMENTS OF THE SOLAR CONSTANT OF RADIATION AT CALAMA, CHILE.

By C. G. ABBOT.

[Dated: Astrophysical Observatory, Smithsonian Institution, Washington, Oct. 13, 1919.]

In continuation of preceding publications I give in the following table the results obtained at Calama, Chile, in August, 1919, for the solar constant of radiation. The reader is referred to this REVIEW for February, 1919, and July, 1919, for statements of the arrangements and meaning of the table.

During the present month the observations have been made very largely by the new method which was described in the REVIEW for the last-mentioned date, but part of them are also by the old method on which the new is fundamentally based. The reader will see that generally the agreement between the different determinations,

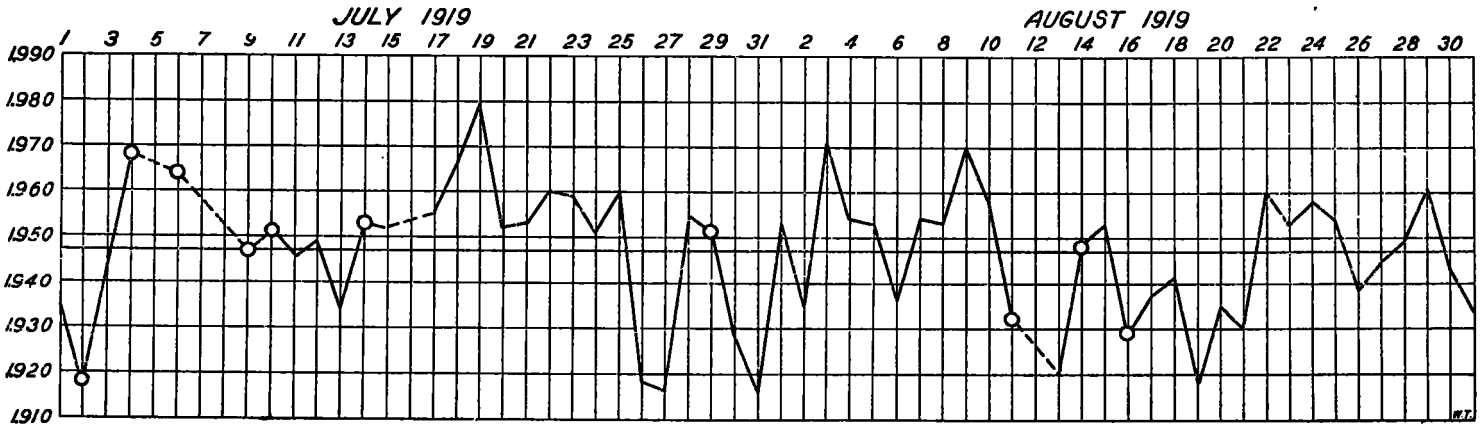

FIG. 1.—Solar constant values obtained at Calama, Chile. (Where circles are shown, but one set of observations is represented.)