under the first part of the overcast he found that the fog was increasing and the visibility decreasing steadily. After about 10 minutes the fog became dense and merged with the ceiling until he could not see the ground from an elevation of 100 feet and had practically no horizontal visibility.

Having flown over this country regularly for a year, he was quite familiar with the terrain and decided to continue at a very low altitude for a few minutes, with the hope that conditions would improve. Instead of improving, the fog became denser, until he was flying blind barely over the treetops. The air became rough and set the compass to spinning and he finally became lost. He decided to land in any field that he could get down in. In a few minutes he had a glimpse of a field that looked suitable, but was past it before he could cut his engine and land. He banked to turn into the field and was flying, so low that the low wing took a large limb off a tree. Then he found that the field was so small that he "couldn't even get his tailskid in it," to use his own words.

He flew around aimlessly for about 15 minutes, after which the air became smoother, and he was able to set a compass course for Moline. He ran out of the fog and overcast within five minutes after finding the course and the rest of his trip was uneventful.

When asked what his reaction was while in the fog, he stated: "I was too busy dodging trees and hilltops to be worried where I would end up, but I believe that I will try to avoid all the blind flying that I can hereafter."

It is believed that the foregoing incident shows how highly important an accurate knowledge of weather conditions ahead is to the pilot, for had he known the exact conditions to be met he would never have attempted to fly underneath the extremely low ceiling present, but would have flown over the top of it, knowing that it was clear to the north.

As a passing thought of comment, pilots are always adverse to flying over the top of bad weather conditions, unless they know the extent of the overcast area. They are apprehensive that they may be drifted off their course by unknown air currents, and later will have to come down through a cloud layer that may be practically on the ground. In this case they would not be aware that they were near the ground until too late to avoid a crash, as the pressure altimeter has a very appreciable lag when ascending or descending.

Meteorological summary for Chile, December, 1929, by J. Bustos Navarrete, Observatorio del Salto, Santiago, Chile.—In December, 1929, there was a slight increase in the intensity of the atmospheric circulation over the Pacific Ocean with an accompanying increase in rainfall in the southern region of the country.

The principal anticyclones were charted as follows: 1st–5th, 9th–10th, and 26th–30th; the principal depressions: 7th–8th, 10th–12th, 18th–20th. The latter storm brought general rains from Aconcagua to Chiloe and much snow on the cordilleras.

In the central zone of Chile the periods of warm weather were marked by only slight intensity.—*Translated by W. W. R.*

BIBLIOGRAPHY

C. FITZHUGH TALMAN, in Charge of Library

RECENT ADDITIONS

The following have been selected from among the titles of books recently recieved as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

Baldit, Albert.
Météorologie du relief terrestre; vents et nuages. Paris. 1929. xii, 328 p. figs. 25½ cm.

Carpenter, Ford A.
Sunspots, cycles and seasonal rainfall. unp. figs. 25½ cm. (Repr.: Cal. cultivator. Nov. 9, 1929. v. 73, no. 19.)

Chandler, Hatchett.
Origin and nature of a tropical hurricane . . . [Dallas.] c1922. 68 p. charts (1 fold.) 23½ cm.

Commission de météorologie agricole.
Procès-verbaux de la 3ème réunion, Copenhague 1929. Stockholm. 1929. 101 p. illus. 24½ cm. (Stat. met. hydrog. anst. N: r 276. Organ. mét. internat.)

Eredia, Filippo.
La meteorologia. Roma. 1929. 266 p. illus. plates. 17 cm. (Coll. omnia. 15–16.)

Fujiwhara, S.
On the growth and decay of vortical systems and the mechanism of extratropical cyclones. Tôkyô. 1923. v. p. figs. plates. 31½ cm. (Bull. Cent. met. observ. Japan. v. 3, no. 5.)

Petitjean, L.
Dix années de sondages à Alger (1918–1928). [Paris.] n. d. 37 p. figs. 27½ cm. (Extr.: La météorologie. Avr.-juin 1929.)

Preuss, Friedrich Wilhelm.
Gewitter-Schäden . . . Bd. 1–2. Altdamm bei Stettin. n. d. illus. 23½ cm.

Walker, Gilbert Thomas.
Some problems of Indian meteorology, being the Halley lecture delivered on May 31 1929. Oxford. 1929. 23 p. figs. 23 cm.

SOLAR OBSERVATIONS

SOLAR RADIATION MEASUREMENTS DURING JANUARY, 1930

By HERBERT H. KIMBALL, Solar Radiation Investigations

For reference to descriptions of instruments and their exposures the reader is referred to this REVIEW, 57:26, January, 1929. Since that date there have been added to the stations for which data are published in Table 2, La Jolla, Calif., latitude 32° 50′ N., longitude 117° 15′ W., altitude 26 meters above sea level; Gainesville, Fla., latitude 29° 39′ N., longitude 82° 21′ W., altitude 71 meters; and Pittsburgh, Pa., latitude 42° 26′ N., longitude 80° 0′ W., altitude 341 meters. The records from La Jolla are furnished by Mr. Burt Richardson, Scripps Institution of Oceanography, University of California, and are made by a Weather Bureau thermoelectric pyrheliometer in connection with an Engelhard recording microammeter. The records from Gainesville are furnished by Mr. Mark D. Butler, College of Engineering, University of Florida, and are made by a Moll thermoelectric pyrheliometer recording on a Richard microammeter. Both of these recording pyrheliometers were standardized at the Weather Bureau observatory, American University, D. C., by comparison with Weather Bureau substandard pyrheliometers, which, in turn, are standardized by comparison with Smithsonian standard instruments. This is true of all the instruments used in obtaining records that are published in Tables 1 and 2. The Weather Bureau station in

Pittsburgh was equipped with a Weather Bureau thermoelectric pyrheliometer and an Engelhard recording microammeter near the end of December, 1929.

Table 1 shows that there were only a few days in January at Washington when the sky was sufficiently free from clouds to justify measurements of the intensity of direct solar radiation, and on these days the intensities on the whole were close to the average for January. At Madison measurements were obtained on an unusually large number of days, but the presence of smoke caused the intensities to average low. At Lincoln there were many clear days during the last decade of the month, with intensities only slightly below the average.

Measurements of the total solar radiation received on a horizontal surface summarized in Table 2, show a decided deficiency at Washington, New York, and La Jolla, close to the average at Madison, and an excess at the remaining stations for which average weekly values have been determined.

On account of a snow cover at Washington and Madison during most of the month skylight polarization measurements were not obtained.

TABLE 1.—*Solar radiation intensities during January, 1930*

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

Washington, D. C.

Date	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 A. M.					Air mass P. M.				Local mean solar time
	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.*
Jan. 4	2.87			1.13	1.27			0.98	0.76		2.16
Jan. 6	3.63	0.84	0.98	1.16	1.27						4.37
Jan. 9	10.21				1.15						01.59
Jan. 25	1.78		0.75	1.07	1.28		1.20				2.36
Means		(0.84)	(0.86)	**1.12**	**1.24**		(1.20)	(0.98)	(0.76)		
Departures		+0.11	+0.02	+0.11	+0.01		−0.03	−0.05	−0.11		

Madison, Wis.

Date	75th mer. time	5.0	4.0	3.0	2.0	1.0	2.0	3.0	4.0	5.0	Local mean solar time
Jan. 2	2.74	0.80	0.91	1.04							3.99
Jan. 3	1.60	0.98	1.10	1.27				1.25			1.37
Jan. 7	0.91	0.79	0.97	1.11				1.09			0.96
Jan. 10	0.91	0.93	1.07	1.23				1.00			1.07
Jan. 16	1.07							1.18			0.91
Jan. 20	1.02							0.87			0.91
Jan. 21	0.51		0.73	1.03							0.58
Jan. 22	0.36			0.93				1.08			0.51
Jan. 23	0.43		0.61	0.90							0.86
Jan. 25	1.12			1.24	1.44						0.66
Jan. 28	0.96		0.74	1.14	1.42			1.29			1.52
Jan. 29	0.58		0.61	0.82	1.36						1.07
Means		**0.88**	**0.84**	**1.07**	**1.41**			**1.11**			
Departures		−0.07	−0.21	−0.14	+0.05			−0.09			

Lincoln, Nebr.

Date	75th mer. time	5.0	4.0	3.0	2.0	1.0	2.0	3.0	4.0	5.0	Local mean solar time
Jan. 3	2.16							1.15	1.02	0.89	3.15
Jan. 4	2.49	1.01	1.12	1.24	1.37			1.10	0.84		2.49
Jan. 21	0.46	0.95	1.07	1.22	1.43						0.66
Jan. 22	0.46		1.04	1.23	1.42			1.25	1.11	0.97	1.07
Jan. 23	0.74	0.56	0.78	0.97	1.33						1.60
Jan. 24	1.45							1.20	1.07	1.00	1.96
Jan. 25	1.24		1.08	1.17							1.52
Jan. 28	1.24			1.18	1.40		1.39	1.19	1.07	0.94	1.52
Jan. 29	1.32	0.86	0.91	1.08	1.29						2.62
Means		**0.84**	**1.00**	**1.16**	**1.37**		(1.39)	**1.18**	**1.02**	**0.95**	
Departures		−0.09	−0.05	−0.02	−0.01		−0.03	+0.01	−0.03	+0.03	

[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	Pittsburgh	Gainesville	Twin Falls	Fresno	La Jolla
	Average daily totals									
1930	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Jan. 1	158	122	185	112	128	106	302	205	185	195
Jan. 8	90	95	145	47	49	48	250	243	168	156
Jan. 15	123	187	234	162	75	103	172	295	166	190
Jan. 22	165	227	272	229	144	126	296	281	216	192
	Departures from weekly normals									
Jan. 1	+6	−14	+1	+30	+18			+29	+39	−37
Jan. 8	−63	−50	−44	−35	−56			+60	+15	−63
Jan. 15	−34	+25	+33	+65	−40			+104	−18	−25
Jan. 22	−15	+38	+50	+117	+1			+101	−10	−39
Accumulated departure on Jan. 28	−742	−7	+280	+706	−539			+2,058	+104	−1,148

POSITIONS AND AREAS OF SUN SPOTS

[*Communicated by Capt. C. S. Freeman, Superintendent U. S. 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
1930	*h* *m*	°	°	°			
Jan. 1 (Naval Observatory).	11 42	−85.0	47.3	−5.0		247	
		−73.0	59.3	+10.0	31		
		+12.5	144.8	+12.0		139	
		+62.5	194.8	+17.5		386	803
Jan. 2 (Naval Observatory).	13 21	−76.0	42.3	−6.0		432	
		−73.0	45.3	+5.0	139		
		−59.0	59.3	+9.5	31		
		+27.0	145.3	+11.5		77	
		+78.5	196.8	+17.0	247		926
Jan. 3 (Naval Observatory).	11 8	−64.0	42.3	−6.0		309	
		−61.0	45.3	+5.0	123		
		−47.0	59.3	+9.5		31	
		−19.0	87.3	+5.0	3		
		+37.5	143.8	+12.0		62	528
Jan. 4 (Naval Observatory).	11 13	−49.5	43.6	−6.0		216	
		−46.5	46.6	+5.5	123		
		−33.0	60.1	+10.0	31		
		−15.5	77.6	−5.5	3		373
Jan. 5 (Naval Observatory).	11 16	−75.0	4.9	−8.5	77		
		−37.5	42.4	−5.0		340	
		−33.5	46.4	+5.5	123		
		−20.0	59.9	+10.0	31		571
Jan. 6 (Naval Observatory).	11 16	−76.5	350.2	+7.5	494		
		−76.0	350.7	−3.5	123		
		−61.5	5.2	−8.5	62		
		−24.5	42.2	−5.0		278	
		−19.5	47.2	+6.0	123		
		−6.5	60.2	+10.5	31		1,111
Jan. 7 (Naval Observatory).	14 4	−62.5	349.5	−3.0		154	
		−60.0	352.0	+7.0	478		
		−46.5	5.5	−8.5	31		
		−8.5	43.5	−5.0		231	
		−5.5	46.5	+5.5	123		
		+9.0	61.0	+10.0	31		1,048
Jan. 8 (Naval Observatory).	11 40	−53.5	346.7	−2.0		324	
		−48.5	351.7	+7.0	463		
		−36.0	4.2	−8.5		77	
		+3.5	43.7	−5.0		231	
		+7.0	47.2	+5.5	123		
		+21.5	61.7	+10.0	25		1,243
Jan. 9 (Naval Observatory).	11 12	−40.0	347.2	−2.0		401	
		−35.5	351.7	+7.0	432		
		−20.0	7.2	−8.0	31		
		+17.5	44.7	−5.0		154	
		+20.0	47.2	+5.0	108		
		+34.5	61.7	+10.5	25		1,151
Jan. 10 (Yerkes)	11 51	−66.0	307.8	+4.5	56		
		−29.0	344.8	−2.0		516	
		−22.5	351.3	−4.5	244		
		−21.5	352.3	+6.5	731		
		+33.5	47.3	+4.5	216		
		+36.5	50.3	−4.0		57	1,820