WISCONSIN BEGINS SNOW SURVEY.

[Reprinted from Engineering News-Record, New York, Jan. 27, 1921, p. 181.]

On selected main highways in Wisconsin records are being kept this winter of the character and extent of snow movement by the wind; of drift formation, location, and magnitude, and all similar facts in connection with the accumulation of snow on these roads. Reports will be made on simple forms which, in addition to the snow data, call for suggestions as to means of prevention of drifts by windbreaks, fences, hedges, etc. It is believed that with such records plans may be formulated for barriers and other drift preventives which will materially reduce obstruction of highways. While the surveys are being conducted by country highway commissions, the routes surveyed are selected by the State Highway Commission, J. T. Donaghey, maintenance engineer.

ZONAL VARIATION OF THE YEARLY MARCH OF AIR TEMPERATURE.[1]

By F. K. VON MARILAUN.

[Reprinted from Science Abstracts, Dec., 1920, § 1239.]

The mean monthly temperature of zones each comprising 10° of latitude, as given by Hopfner (Petermann's geogr. Mitt. 52, 1906), are analyzed by obtaining the first three terms of Bessel's formula, this number giving sufficient approximation. Combining these terms, the times of maximum and minimum temperature for each zone are tabulated, together with the percentage of sea cover in each zone, thus bringing into prominence the tendency for greater lag with greater sea cover. The increase of yearly range of temperature with increased land cover is similarly exhibited and the relation is approximately linear if the range be divided by the latitude.

In the second paper the assumption often made that with a water hemisphere the zonal temperature decreases as cos ϕ, and with a land hemisphere as $\cos^2 \phi$ is tested for such zonal temperatures partly empirical, partly theoretical, given by various authors. This rate of decrease is not found in any case. For a water hemisphere a good fit is obtained by using the expression $\cos^m \phi$, m being a function of ϕ, not the same for all the authors. The form of m is, however, $a-b \cos \phi$ in three out of the seven cases examined, a being near 2 and b near 1. This indicates a decrease proportional to cos ϕ at the equator and to $\cos^2 \phi$ at the pole. For a land hemisphere the expression $\cos^m \phi$ is also found suitable, but only with three authors out of five does m indicate a greater rate of decrease than with a water hemisphere.—*M. A. G.*

[1] Akad. Wiss., Vienna, vol. 128, 2a, 1919, pp. 145-174.

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SPECIAL OBSERVATIONS.

SOLAR AND SKY RADIATION MEASUREMENTS DURING JANUARY, 1921.

By HERBERT H. KIMBALL, Meteorologist.

[Solar Radiation Investigations Section, Washington, Feb. 28, 1921.]

For a description of instruments and exposures, and an account of the methods of obtaining and reducing the measurements, the reader is referred to this REVIEW for April, 1920, **48**: 225.

From Table 1 it is seen that the solar radiation intensities measured averaged slightly above the normal for January at all the stations. At Washington, D. C. a noon intensity of 1.43 gram-calories per minute per square centimeter, measured on the 18th and again on the 26th is the highest intensity ever measured at Washington in January.

Table 2 shows a deficiency in the radiation received from the sun and sky at Madison and Lincoln, except during the second week, the deficiency being especially marked during the third and fourth weeks. This deficiency is to be attributed to the cloudiness. The table shows about the normal amount of insolation at Washington.

Sky-light polarization measurements obtained on four days at Madison when the ground was free from snow give a mean of 72 per cent and a maximum of 76 per cent on the 23d. There was practically no snow on the ground during the month at Washington, and sky polarization measurements obtained on four days give a mean of 60 per cent, with a maximum of 65 per cent on the 4th. These are slightly above the January averages at both stations.

TABLE 1.—*Solar radiation intensities during January, 1921.*

[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 meridian 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.*
Jan. 4	4.57	0.76	0.87	0.98	1.19	1.39	.....	1.01	0.87	0.75	5.56
5	6.50	.....	.....	.....	.....	.....	.....	1.01	.....	.....	5.36
17	4.80	0.65	0.76	0.90	1.24	.....	.....	.....	.....	.....	1.52

* Extrapolated.

TABLE 1.—*Solar radiation intensities during January, 1921*—Contd.

WASHINGTON, D. C.—Continued.

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 meridian 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.*
Jan. 18	3.73	1.01	1.13	.....	1.43	1.61	1.42	.....	.....	1.14	1.12
21	3.81	.....	0.69	0.90	.....	.....	.....	.....	.....	.....	4.95
23	7.04	.....	.....	.....	1.26	.....	.....	.....	.....	.....	4.57
24	2.49	0.77	.....	.....	.....	.....	1.09	0.81	0.58	.....	2.62
25	1.32	0.99	1.09	1.21	1.37	1.54	.....	.....	.....	.....	1.24
26	1.12	.....	.....	1.26	1.40	.....	1.38	1.13	.....	.....	1.52
27	1.60	.....	.....	.....	.....	.....	.....	1.05	.....	.....	1.24
28	1.60	0.88	0.97	1.12	1.11	.....	.....	.....	.....	.....	1.96
Means	.....	**0.84**	**0.92**	**1.06**	**1.29**	.....	**1.30**	**1.01**	**(0.72)**	**(0.94)**	
Departures	.....	**+0.07**	**+0.04**	**+0.04**	**+0.06**	.....	**+0.06**	**−0.02**	**−0.16**	**+0.15**	

MADISON, WIS.

Jan. 8	2.74	0.92	1.09	1.29	.....	.....	.....	1.31	.....	.....	3.62
12	0.86	1.11	1.22	1.34	.....	1.60	.....	1.32	.....	.....	1.07
17	0.86	.....	1.13	.....	.....	.....	.....	.....	.....	.....	1.32
23	3.30	.....	1.14	.....	1.40	1.56	.....	.....	.....	.....	3.00
24	2.26	.....	1.03	.....	.....	.....	.....	.....	.....	.....	2.87
26	2.49	.....	.....	.....	.....	.....	.....	1.06	1.01	.....	3.30
Means	.....	**(1.02)**	**1.12**	**(1.32)**	**(1.40)**	.....	.....	**1.23**	**(1.01)**	.....	.....
Departures	.....	**+0.08**	**+0.03**	**+0.06**	**+0.05**	.....	.....	**−0.01**	**−0.12**	.....	.....

LINCOLN, NEBR.

Jan. 11	1.96	.....	.....	.....	1.51	.....	.....	.....	.....	.....	3.30
12	1.24	1.03	1.20	1.31	.....	.....	.....	1.25	1.15	.....	1.78
14	2.26	.....	.....	1.26	.....	.....	.....	.....	.....	.....	3.81
21	4.17	.....	.....	1.09	.....	.....	.....	.....	.....	.....	5.56
Means	.....	**(1.03)**	**(1.20)**	**1.22**	**(1.51)**	.....	.....	**(1.25)**	**(1.15)**	.....	.....
Departures	.....	**+0.07**	**+0.14**	**+0.04**	**+0.14**	.....	.....	**+0.04**	**+0.07**	.....	.....

SANTA FE, N. MEX.

Jan. 8	1.68	.....	.....	.....	1.54	.....	.....	.....	.....	.....	1.32
14	1.68	.....	.....	1.43	1.52	.....	1.53	1.38	1.29	1.19	2.00
15	2.16	.....	.....	.....	.....	.....	1.48	1.32	.....	.....	3.15
24	1.88	.....	.....	1.44	1.54	.....	.....	1.35	1.18	1.10	2.74
25	2.06	.....	.....	1.41	1.57	.....	1.45	.....	.....	.....	2.62
28	3.81	.....	.....	1.21	.....	.....	.....	.....	.....	.....	4.37
29	3.99	.....	.....	.....	.....	.....	1.51	.....	.....	.....	2.87
Means	.....	.....	.....	**1.37**	**1.54**	.....	**1.49**	**1.35**	**(1.24)**	**(1.14)**	.....
Departures	.....	.....	.....	**−0.01**	**+0.03**	.....	**+0.01**	**+0.01**	**+0.02**	**−0.01**	.....

* Extrapolated.