TABLE 3.—*Observations of solar radiation*—Continued.

Date.	T.	Q.	N.	ϑ.	δ.	Z.	Barometer.	Temperature.	Relative humidity.	Absolute humidity.	Weather.
1902.	h. m.			° ′	(South.) ° ′	° ′	Inches.	° F.	Per cent.	Grs. cu. ft.	
August 20	7:44	0.914	.....	64 0	12 37	62 20	.74	65	76	5.154	No clouds; haze.
	8:50	1.102	.....	47 30	.....	50 25	.74	66	63	2.313	Fine sky.
	9:44	1.064	.....	34 0	.....	41 35	.75	68	59	4.414	Fine cirrus over sun.
	10:44	1.093	.....	19 0	.....	33 35	.75	69	55	4.250	Cumuli (3); readings variable.
	11:51	1.076	.....	2 15	.....	29 15	.75	71	50	4.120	Cumuli (6); readings variable.
	1:25	1.040	.....	21 15	.....	34 35	.75	72	47	3.999	Cumuli (4).
25	9:02	1.048	.....	44 30	10 56	49 35	.78	68	67	5.012	Few cumuli.
	10:03	1.109	.....	29 15	.....	40 05	.77	69	61	4.713	Cumuli (5).
	10:56	1.166	.....	16 0	.....	33 55	.75	70	54	4.309	Cumuli (3).
26	7:22	0.840	.....	69 30	10 36	67 45	.71	62	84	5.160	No clouds; some haze.
	8:28	0.915	.....	53 0	.....	55 40	.71	67	72	5.214	Clear.
	9:32	1.083	.....	37 0	.....	45 00	.71	70	64	5.107	Do.
	10:32	1.127	.....	22 0	.....	36 40	.71	73	55	4.830	Do.
	11:37	1.103	.....	5 45	.....	31 40	.70	74	51	4.624	Few cumuli.
	12:27	1.142	.....	6 45	.....	31 45	.69	76	50	4.828	Cumuli (2).
	2:27	1.053	.....	36 45	.....	44 50	.67	78	45	4.625	Do.
	3:31	0.973	.....	52 45	.....	55 30	.66	78	45	4.625	Cumuli (1).
27	6:37	0.352	.....	80 45	10 15	76 20	.73	62	89	5.467	Heavy haze near sun.
	6:55	0.452	.....	76 15	.....	73 00	.74	63	85	5.397	Haze over sun.
	7:21	0.625	.....	69 45	.....	68 10	.74	66	80	5.607	Haze.
31	10:04	0.740	.....	29 0	8 50	41 45	.88	70	69	5.506	Heavy haze.
	11:01	0.813	.....	14 45	.....	35 30	.86	74	64	5.798	Do.
	12:11	0.783	.....	2 45	.....	33 05	.85	78	63	6.473	Heavy haze; readings variable.
	1:38	0.858	.....	24 30	.....	39 25	.83	78	67	6.887	Some cirrus; haze over sun.
	2:44	0.908	.....	41 0	.....	48 50	.80	76	70	6.758	Do.
	3:49	0.519	.....	57 15	.....	59 55	.79	75	75	7.017	Some cirrus; heavy haze.
September 1	7:54	0.548	.....	61 0	8 28	62 55	.77	73	91	7.992	No clouds; haze over sun.
	8:43	0.673	.....	49 15	.....	54 35	.76	77	73	7.272	No clouds; very hazy day.
	10:23	0.815	.....	24 15	.....	39 40	.76	80	63	6.889	Do.
	11:29	0.825	.....	7 45	.....	34 05	.75	83	56	6.715	Do.
	12:42	0.799	.....	4 30	.....	33 35	.73	83	46	5.516	Do.
	2:22	0.794	.....	35 30	.....	45 45	.70	84	47	5.807	No clouds; haze.
3	8:00	0.970	(?) 3	60 0	7 44	62 40	.85	65	67	4.543	No clouds; haze over sun.
	8:56	1.059	.....	46 0	.....	52 55	.86	70	55	4.389	No clouds.
	10:01	1.069	.....	29 45	.....	43 05	.87	72	51	4.339	Do.
	11:05	1.139	.....	13 45	.....	36 10	.86	73	49	4.303	No clouds; wind.
	11:51	1.168	.....	2 15	.....	34 10	.85	73	46	4.040	No clouds; gusty wind.
	1:32	1.150	.....	23 0	.....	39 40	.84	74	44	3.988	No clouds; readings variable.
5*	8:40	1.130	.....	50 0	7 00	56 10	.80	60	63	3.620	Fine sky.
16	1:55	0.786	.....	28 45	2 50	46 45	30.04	67	40	2.896	Blue sky; light streaky haze.
	2:48	0.775	8	42 0	.....	54 10	.03	66	41	2.874	Do.
	4:23	0.372	.....	65 45	.....	70 10	.03	65	42	2.849	Do.
	5:04	0.298	.....	76 0	.....	77 40	.03	64	45	2.954	Do.
17	8:31	0.348	.....	52 15	2 27	61 00	.12	55	91	4.413	Bluish sky; haze.
	11:04	0.698	.....	14 0	.....	41 20	.12	65	63	4.272	Do.
	12:43	0.801	.....	10 45	.....	40 35	.10	67	45	3.258	Bluish sky; haze heavier.
	1:40	0.737	.....	25 0	.....	45 20	.10	67	44	3.184	Do.
	2:35	0.603	.....	38 45	.....	52 30	.09	66	45	3.206	Do.
	3:01	0.548	.....	45 15	.....	56 25	.09	66	46	3.224	Do.
	4:49	0.250	.....	72 15	.....	75 10	.09	64	57	3.742	Bluish sky; haze streaky.
	5:04	0.175	.....	76 0	.....	78 00	.09	63	59	3.745	Bluish sky; haze quite heavy.
23	9:45	0.852	.....	33 45	0 07	51 35	29.76	63	84	5.333	Bluish sky; some haze.
	12:27	0.961	.....	6 45	.....	42 10	.72	72	51	4.479	Bluish sky (oppressively hot).
	2:55	0.858	.....	43 45	.....	57 20	.69	73	52	4.567	Bluish sky; few cumuli.
					(South).						
24	7:39	0.510	.....	65 15	0 16	72 00	.72	65	90	6.104	Bluish sky; clouds near horizon.
	8:32	0.670	.....	52 0	.....	62 55	.72	68	85	6.358	Do.
28	10:44	0.852	.....	19 0	1 50	46 55	.59	71	73	6.015	Do.
	12:42	0.970	(?) 2	10 30	.....	44 40	.57	71	74	6.098	Scattered clouds; readings variable.
	12:53	0.243	(?) 2	13 15	.....	45 15	.56	71	74	6.098	Through a cloud.

* The observations of July 4 to September 5, inclusive, were made by Mr. Robinson Pierce, jr.; all others by Mr. H. N. Davis.

sor Upton, and those taken at the Hope Reservoir for the city engineer. These stations are quite close to each other and to both places at which observations were made; and since the continuous record sheets were more accessible at the former place, and were found upon comparison to agree reasonably with the tabular synopsis published by the city engineer they have been used.

The barometer readings are in inches and are not reduced to sea level. The instrument is 214 feet above sea level. The relative humidity and temperature (t) are also taken from the continuous records, and these as well as the barometer readings are compared once a day with standard instruments. The absolute humidity is given in grains per cubic foot, and is calculated from relative humidity and temperature by means of the tables[5] supplied by the Weather Bureau. In the last column are given such cloud notes as were made at the time of each observation. In general the term cumulus was accurately used, while cirrus and stratus were applied more loosely, the first to wispy, the second to sheet forms, and should not be relied upon too literally. Where figures are given they indicate the amount of sky covered, in tenths.

It seems hardly worth while to attempt a direct determination of the solar constant itself by the usual methods from these data, for morning observations in Providence are almost always influenced by a heavy haze on the horizon, and very rarely are conditions even approximately uniform throughout any considerable portion of a day. Their chief value would appear to be more strictly meteorological, and it is hoped that they and such others of the same kind as may have been collected by the Bureau may be discussed from this point of view.

[5] "Psychrometric Tables, etc.," prepared by Prof. C. F. Marvin. Washington, 1900. Table XII, pp. 83-84.

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NOTES AND EXTRACTS.

AN INCIPIENT TORNADO IN IOWA.

Mr. Charles A. Robertson, of Onawa, Monona County, Iowa, staff correspondent of the Sioux City Tribune, furnishes an account of a whirlwind in the eastern part of Monona County, between 5:15 and 5:30 p. m. Friday, June 26, 1903. He says:

A great mass of black clouds was gathering, and on the western edge of a rift in the clouds were plainly to be seen two strange objects. In the north and west the sky was clear and the sun shining, while in the southeast, for fully half an hour, the queer long-tailed specters wavered in the air, moving in a general way southerly. Suddenly, the long tail of the larger whirl seemed to part from the upper funnel-shaped mass and descend to the ground like a long tin waterspout, while a faint light ap-