was that which always causes high temperatures over the south Pacific coast district, it was not unusually pronounced, and did not give record temperatures in any other portion of California. The wind along the eastern slope of the Sierra was very light and from the north, causing a slow southward movement of the air from the high plateau and mountain regions of northern Nevada. As it was descending it was heated dynamically in passing down the western slopes of the Amargosa and Funeral Mountains to the deep valley below. Once in the valley the surface air probably became stagnant owing to the high walls at the south end, and was heated rapidly by the reflected heat from the rocks and desert floor of the valley.

The condition was probably local as is often the case in mountainous regions, and the exceptionally high temperatures were confined to Death Valley.

The following tables present the temperature records of this hottest station, by years and months:

TABLE 1.—*Temperatures recorded by Weather Bureau thermometers in a standard shelter at Greenland ranch, Inyo County, Cal.*

[Lat. 36° 27′ N.; long. 116° 50′ W. Alt., −178 feet, M. S. L.]

HIGHEST TEMPERATURE.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.
1911	....	....	....	....	....	120	122	122	118	100	90	80	122
1912	85	88	91	98	120	120	118	120	112	99	87	82	120
1913	82	90	98	109	120	119	134	124	116	105	90	74	134
1914	73	85	98	104	116	124	122	126	112	101	91	82	126
1915	76	75	92	101	113	....	....	....	....	....	....	....	....
Monthly extremes	85	90	98	109	120	124	134	126	118	105	91	82	134

LOWEST TEMPERATURE.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
1911	....	....	....	....	....	63	72	69	60	51	27	22	22
1912	22	33	38	36	55	57	67	68	56	42	32	21	21
1913	15	30	36	47	52	60	70	74	66	60	58	52	15
1914	52	47	52	50	53	60	76	70	60	68	57	52	47
1915	50	43	45	56	52	....	....	....	....	....	....	....	....
Monthly extremes	15	30	36	36	52	57	67	68	56	42	27	21	15

MEAN TEMPERATURE.

[½(mean max.+mean min.)]

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
1911	....	....	....	....	....	93.8	100.2	97.2	87.6	72.8	59.6	51.6	....
1912	53.0	60.0	65.5	71.6	82.4	90.2	95.2	96.0	83.2	71.9	59.1	48.8	73.8
1913	45.8	57.3	63.2	77.2	84.8	92.4	98.6	100.4	92.6	82.4	72.4	61.8	77.4
1914	65.2	67.3	73.4	75.4	85.8	91.4	101.6	100.4	90.0	81.9	72.6	66.2	80.9
1915	64.6	61.8	69.8	78.1	80.4	....	....	....	....	....	....	....	....
Means	57.2	61.6	68.0	75.6	83.4	92.0	98.9	98.5	88.4	77.2	65.9	57.1	77.0

MEAN MAXIMUM TEMPERATURE.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
1911	....	....	....	....	....	111.9	117.0	115.6	105.2	91.0	78.1	68.9	....
1912	72.7	80.6	81.5	88.7	100.0	109.5	110.7	111.4	100.9	88.4	78.9	67.7	....
1913	65.1	72.7	81.4	96.2	103.4	110.0	116.4	116.5	107.4	94.6	78.6	65.7	....
1914	68.8	75.1	86.3	88.5	100.2	106.9	116.6	116.2	109.0	91.5	81.5	72.9	....
1915	69.8	69.0	82.6	91.4	95.4	....	....	....	....	....	....	....	....
Means	69.1	74.4	83.0	91.2	99.8	109.6	115.2	114.9	105.6	91.4	79.3	68.8	91.9

MEAN MINIMUM TEMPERATURE.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
1911	....	....	....	....	....	75.7	83.5	78.9	70.1	54.7	41.2	34.3	....
1912	33.2	39.3	49.5	54.5	64.8	71.0	79.6	80.7	65.4	55.4	39.3	30.0	....
1913	26.5	41.9	44.9	58.2	66.2	74.9	80.8	84.4	77.7	70.2	66.2	57.8	....
1914	61.5	59.5	60.6	62.3	71.3	76.0	86.5	84.5	70.9	72.3	63.7	59.4	....
1915	59.3	54.6	57.0	64.8	65.3	....	....	....	....	....	....	....	....
Means	45.1	48.8	53.0	60.0	66.9	74.4	82.6	82.1	71.0	63.2	52.6	45.4	62.1

SUMMER TEMPERATURES AT PARIS AND AT RENO, NEV.

By H. F. ALCIATORE, Section Director.

[Dated: Weather Bureau, Reno, Nev., May 26, 1915.]

In connection with Angot's method for classifying summers (Monthly Weather Review, Nov., 1914, **42**: 628–629) I here submit a tabulated statement of temperature excesses (on a basis of 30°C. or 86°F.), differences, and departures for Reno, Nev., and Paris, France. Angot has stated that his method gives results to a certain extent dependent upon the temperature selected for the lower or starting point. As the only Paris data at hand are those for summers compared on a basis of 30° C., I selected the same temperature for comparing Reno's summers. It is evident that a starting temperature of 86°F. (30°C.) is too low for Reno, the average excess for the summer being 177°F. as against 27°F. at Paris.

In a way, the starting temperature, if judiciously chosen, could be such as to give one a fairly good idea of what might be called the "discomfort units" of summer. For example, at Reno (and probably at 99 per cent of the regular Weather Bureau stations) a day on which the temperature exceeds 90°F. (32.2°C.), would be termed a warm day, while one with 87°F. (30.6°C.) would not.

TABLE 1.—*Reno and Paris summers compared.*

(Reno: Lat., 39° 32′ N.; long., 119° 49′ W.; elevation, 4,500 feet above sea level.)

[Sums of maximum temperatures exceeding 86°F.]

Year.	At Reno—						Sum, Reno.	Sum, Paris.	Difference, Paris-Reno.	Departures at—	
	Apr.	May.	June.	July.	Aug.	Sept.				Paris.	Reno.
1888	2	.....	.....	46	84	26	158	9.0	−149.0	−21.3	−19
1889	.....	6	38	99	98	23	264	1.1	−262.9	−29.2	87
1890	.....	.....	8	65	27	.....	100	7.7	−92.3	−22.6	−77
1892	.....	.....	19	41	72	12	144	37.4	−106.6	7.1	−33
1893	.....	.....	.....	60	51	.....	111	49.3	−61.7	19.0	−66
1897	.....	.....	3	41	64	.....	108	6.8	−101.2	−23.5	−69
1898	.....	.....	16	98	104	12	230	48.6	−181.4	18.3	53
1899	.....	.....	26	98	.....	15	139	53.1	−85.9	22.8	−38
1901	.....	.....	14	115	51	2	182	28.8	−153.2	−1.5	5
1903	.....	1	14	15	54	16	100	12.4	−87.6	−7.9	−77
1904	.....	.....	15	52	69	17	153	53.6	−99.4	23.3	−24
1905	.....	.....	2	147	68	7	224	10.1	−213.9	−20.2	47
1906	.....	.....	3	173	100	.....	276	43.2	−232.8	12.9	99
1907	.....	.....	.....	40	40	8	88	8.5	−79.5	−21.8	−89
1908	.....	.....	8	155	98	14	275	3.4	−271.6	−26.9	98
1909	.....	.....	21	71	96	3	191	4.0	−187.0	−26.3	14
1910	.....	30	28	156	114	3	331	.....	−331.0	−30.3	154
1911	.....	.....	12	107	40	.....	159	178.7	19.7	148.4	−18
1912	.....	.....	27	54	46	3	130	19.6	−110.4	−11.7	−47
Averages	0.1	4.1	13.4	85.9	67.2	8.5	177.0	30.3	−146.7	.....	.....

Months in which the temperature has not once reached 87° F. are indicated by leaders. All temperatures, differences, and departures are in Fahrenheit degrees. No signs appear before *plus* differences or departures. *Minus* differences indicate that Paris was cooler than Reno. Only years for which complete records for both places are available appear in the table. The values at bottom of table are the 19-year averages. The values for Paris are the Fahrenheit equivalents of the data in Table 2, p. 629, Monthly Weather Review, November, 1914.

Referring to the Reno-Paris table, the most noteworthy fact brought out is, that in 18 out of 19 years Reno's summers have been warmer than those of Paris. The exception was the summer of 1911, which, in Paris, was the hottest on record.

At Reno the greatest monthly excesses occur, as a rule, in July. The average seasonal excess is 177°, more than five times as large as that of Paris. For the 19 years covered by the records, the hottest summer was that of 1910, with an excess of 331°; the coolest, that of 1907, with an excess of only 88°. Eleven of the 19 summers were warmer than usual. No periodic alternation of warm and cool summers has been observable for periods of more than three years' duration.

That the summers of Paris are so very much cooler than those of Reno will probably be a surprise to the French residents of Reno, of whom there are a large number. Now, in Reno, intolerably hot days are unknown, probably because on those days when the temperature exceeds 90° F., the air is always exceedingly dry. To one who has lived in the Middle or Southern States for two or more years, Reno's summers are *imitation* summers, merely. Nobody ever suffers from the effects of the heat in Reno. On many evenings in summer light coats and wraps are worn on Reno's streets. Now, since the average seasonal excess (on a basis of 86°F. or 30°C.) is 30°F. at Paris, as against 177°F. at Reno, it follows that the average Paris summer must be cold. Perhaps this is one reason why thousands of Louisianians and other southerners are so fond of spending the summer season in the capital of France.

It seems to me that comparative summer-temperature tables prepared in the manner suggested by Angot for all the Weather Bureau stations in the United States which claim to be summer resorts should prove both interesting and valuable. It would be highly interesting, for instance, to compare the summers of Asheville, Lake Minnetonka, Colorado Springs, Reno, and San Francisco.

At first thought, it seemed to me that the Angot method would enable us to find a numerical expression for "discomfort degrees" in summer, but after looking into the subject more closely it occurred to me that without the humidity element of the climate, this could not be. To those who are familiar with the climates of San Francisco and Reno, it must be evident that a temperature of 86°F. and a relative humidity of 82 per cent stand for a greater number of discomfort units than do a temperature of 86°F. and relative humidity of 25 per cent. (The humidities cited are the mean 5 p. m. values for San Francisco and Reno, respectively, for July.) Indeed, the first would be a very warm, oppressive day, while the latter would be a comfortable and moderately warm one. I think that the Angot tables would reach their highest degree of usefulness and convenience if, in some manner, the relative humidity were made an integral part of such tables. If this were done in the case of Paris and Reno, perhaps the Paris summers would not turn out to be so cold as the Angot table *without humidities* seems to make them out. Why not use the mean relative humidity at the observation next following the occurrence of the daily maximum temperature? This, I believe, would be sufficiently accurate for practical purposes. Or, in order to avoid the integrating of temperatures and humidities, why not use the mean *wet-bulb* temperature at the observation next following the time of occurrence of the maximum temperatures? In other words, the "sensible temperature," so called.

The importance of humidity data in this connection may be understood by considering some of the climatic conditions that entered into the make-up of an usually warm day in Reno, namely, August 5, 1914. At 1 p. m., the thermometer stood at 98°F. (37°C.); and there was a 3-mile-an-hour breeze blowing from the southeast at the time. At the 5 p. m. observation following, or four hours later, the wet-bulb temperature was 62°F., and the relative humidity only 18 per cent. The sky was cloudless. These are typical warm-weather conditions, and the reader familiar with wet-bulb temperatures and relative humidity data will readily understand why intolerably hot, muggy weather and sunstrokes are unknown in Reno.

WEATHER AND RADIUM EMANATION AT MANILA, P. I.

During the year July, 1913, to July, 1914, J. R. Wright and O. F. Smith, of Manila, P. I., have continued their observations on the amount of radium emanation in the atmosphere of that city, with the object of determining more definitely to what extent the amount of radium emanation in the air is dependent on weather conditions. The details of the work are presented in the "Physical Review" for June, 1915, and we reprint below the general conclusions reached.[1]

Summary of results.

1. The variation of the amount of radium emanation in the atmosphere *at Manila* has been determined for a period of about 13 months. The annual and diurnal variation has been studied in connection with the principal meteorological factors. The effect of weather conditions on the rate at which radium emanation is exhaled from the surface of the ground has been investigated with the object of determining its connection with the emanation content of the atmosphere. The relation between the rate of exhalation and the radioactivity of soil gas at different depths has also been investigated.

2. The variation of the radium-emanation content of the atmosphere has been found to follow quite closely the variations in rainfall and wind movement. [See Table 1.] The ratio of the maximum to the minimum for the year was found to be approximately as 10 to 1. The mean of the monthly means gives for the radium equivalent of the emanation per cubic meter of air a value of 71.0×10^{-12} grams. The month of January shows the highest monthly mean for the radium-emanation content, the minimum value for the rainfall, and a low value for the total wind movement. The month of July gives the lowest monthly mean for the emanation content, the maximum value for the rainfall, and the highest total wind movement. Every other month of the year shows a very similar relation. No direct connection has been discovered between the emanation content and atmospheric pressure or humidity. The effect of the direction of the wind seems at best very indefinite.

TABLE 1.—*Annual variation of the radiation-emanation content at Manila.*

[Number in brackets in last column shows the number of observations entering into the monthly mean.]

Month.	Pressure (mean).	Humidity (mean).	Wind, total movement for month.	Rain (total).	Radium emanation per cubic meter expressed in its radium equivalent.
1913.	*Mm.*	*Per cent.*	*Km.*	*Mm.*	*Grams* $\times 10^{-12}$.
July	756.26	86.2	10,374.6	570.6	23.6 [3]
August	756.93	87.0	8,843.5	349.1	27.6 [3]
September	757.67	85.4	8,664.5	365.5	43.1 [4]
October	758.51	83.4	4,152.0	119.7	62.1 [3]
November	761.04	81.7	3,667.5	31.1	62.7 [2]
December	761.32	80.9	4,021.0	37.8	89.3 [3]
1914.					
January	763.24	76.2	4,925.5	3.5	117.1 [2]
February	762.26	73.8	5,255.5	7.3	108.3 [2]
March	760.77	68.6	6,344.0	6.1	108.6 [1]
April	760.17	70.8	5,921.0	53.4	68.9 [1]
May	758.42	72.6	6,137.5	84.0	83.7 [2]
June	757.62	81.7	6,714.0	367.9	59.0 [2]
July					19.2 [1]
Mean of monthly means					71.0

[1] Wright, J. R., & Smith, O. F. The variation with meteorological conditions of radium emanation in the atmosphere, in the soil gas, and in the air exhaled from the surface of the ground at Manila. Phys. rev., Lancaster, Pa., June, 1915, 5: 459-482.