



James H. Scarr, Forecaster in Charge of United States Weather Bureau on the Twenty-ninth Floor of the Whitehall Building, with His Two Fans for Keeping Cool These Hot Days. In the Background Is the New Hydrograph-Thermograph, with Wet and Dry Bulb Thermometer Attached, with Which He Is Experimenting. (© Powers Engraving Co.)

Humidity This Summer Has Broken Record

It's a Notable Contrast to Just a Century Ago, Which Was "The Year Without a Summer," When Snow Fell in June

IT may not have occurred to you that this is the centenary of the time that has come down to us in meteorological history as "The Year Without a Summer." One of the reasons for overlooking the anniversary may be found probably in the fact that, counting the thirty-one days beginning July 9 and ending Aug. 8, the mean relative humidity in this city has been 83.4 per cent. This is higher than any monthly mean since taking of records by the Weather Bureau began. The highest monthly mean of record for July is 82 per cent., in 1896 and 1897.

The months of June and July, one hundred years ago, were respectively 5 and 5.8 degrees below the normal. Frosts occurred in every month. Indian corn did not ripen. Fruits and grains of every sort were greatly reduced in quantity, or wholly cut off. On the 8th of June, 1816, snow fell in all parts of Northern New England, reaching a depth on the highlands and mountains of five and six inches. On the morning of the 9th ice was one-half an inch thick in shallow standing water, and icicles were formed a foot in length. In July frost occurred as far south as Philadelphia.

Any of our oldest inhabitants and prophets who remembered these times doubtless felt encouragement in predicting similar conditions for the present season—that is, if they started to predict last June. The mean temperature for that month was 64.2 degrees, as compared with an average or normal of 68.5 degrees. Rain in appreciable amount occurred on thirteen days, which is three more than the normal, although the total amount, 3.94 inches, was only .68 inches above the average. Things continued to look good to all such prophets of pessimism until the second week of July, when the apparently defeated forces of Summer weather rallied, and drove the other fellows out of the first, second, and third lines of defense.

Summer is regularly scheduled to begin on June 21, but on the occasion of the 100th anniversary it was not much in evidence until July 7, since which date it has been like the proverbial poor. Perhaps you have noticed how persistently it has stuck around. Even the Weather Man referred to it the other day as sticky weather.

Asked whether in his opinion there was scientific ground for the explanation offered in some quarters that much of the unusual weather this year might be

traced to the more than unusual cannonading in Europe, Mr. Scarr shook his head and said decisively:

"There is nothing—nothing at all—in that."

And upon being asked further about it said he could add nothing to what he had just asserted.

"This weather is rather interesting," said James H. Scarr, head of the New York Weather Bureau, "because when June gave us a good deal of cool weather some of the would-be prophets argued that history would repeat and we would have snow in July. Now, what happened in July? As a matter of fact, the mean daily temperature for July was 73.8 degrees, while the average for July for the last forty-five years is only 73.5 degrees. So July of this year showed only three-tenths of a degree above the average. The highest average mean temperature for July occurred in 1901, and was 78 degrees. The coolest July within this period of forty-five years was in 1884, when the average was 70 degrees.

"It might be interesting to note, incidentally, that so far as moisture for the July just past is concerned, if measured in inches of rainfall, it was drier than the average for that month. The normal rainfall for July is 4.54 inches, while the total for that month this year is 3.44 inches, or more than one inch below the average.

"Moisture as measured in mean relative humidity"—it was evident that Mr. Scarr was going to say something in which all New Yorkers would be able, and doubtless willing, to take an intelligent interest—"has been unusually high. The mean for the month was 79 per cent., while the average or normal is 72 per cent. The highest monthly mean of record for July is 82 per cent., in 1896 and 1897. During the first eight days of July the relative humidity was not unusually high, but counting the thirty-one days beginning July 9 and ending Aug. 8 the mean has been 83.4 per cent. While an extensive search of the records has not been made, it is probable that this average for a thirty-one-day period is among the highest of record. It is positively higher than any monthly mean since the taking of records began.

"The maximum temperature of record for July is 99 degrees, on July 3, 1898, while the highest for July, 1916, is only 93 degrees. Temperature of 90 or more occurred only once in July this year, on the last day of the month, while the

average number of such days for that month is three.

"So you can see that the degree of bodily comfort or discomfort, as may be inferred from a comparison of temperatures I have just enumerated, must depend on something else than actual temperature of the free air as indicated by the thermometer," said Mr. Scarr, who, no matter what the temperature or humidity, will say what he has to say with a smile. "As a matter of fact, it is governed very largely by the relative humidity of the air. If the air under high temperatures is very dry, evaporation of the perspiration of the body produces a cooling effect, so that the degree of discomfort, or heat, sensed corresponds rather closely with the wet-bulb temperatures.

"It is pretty generally known, es-

depending on the relative dryness of the air."

A wet-bulb thermometer was displayed by Mr. Scarr at this point in the conversation, and it was found to be an ordinary thermometer, around the bulb of which is wrapped a thin piece of muslin, or wicking. The mercury in this instrument is cooled by evaporation more or less below the dry bulb or air temperature.

"This wet-bulb temperature," continued Mr. Scarr, "is sometimes called the 'sensible' temperature, because it corresponds more or less closely with the temperature 'sensed' by the nerves distributed through the skin of the body. Generally speaking, dry-bulb or air temperature of 80 degrees or more will produce sensations of bodily discomfort when the wet-bulb temperatures at the same time are much above 70 degrees. Air temperatures of 89 and a wet-bulb temperature of 70 degrees represent a relative humidity of 61 per cent. An increase of temperature to 90 degrees with the wet-bulb remaining at 70 would produce a relative humidity of only 36 per cent., and the degree of bodily comfort experienced under these conditions would not be very materially different from those experienced under a temperature of 80 and a wet-bulb of 70 degrees.

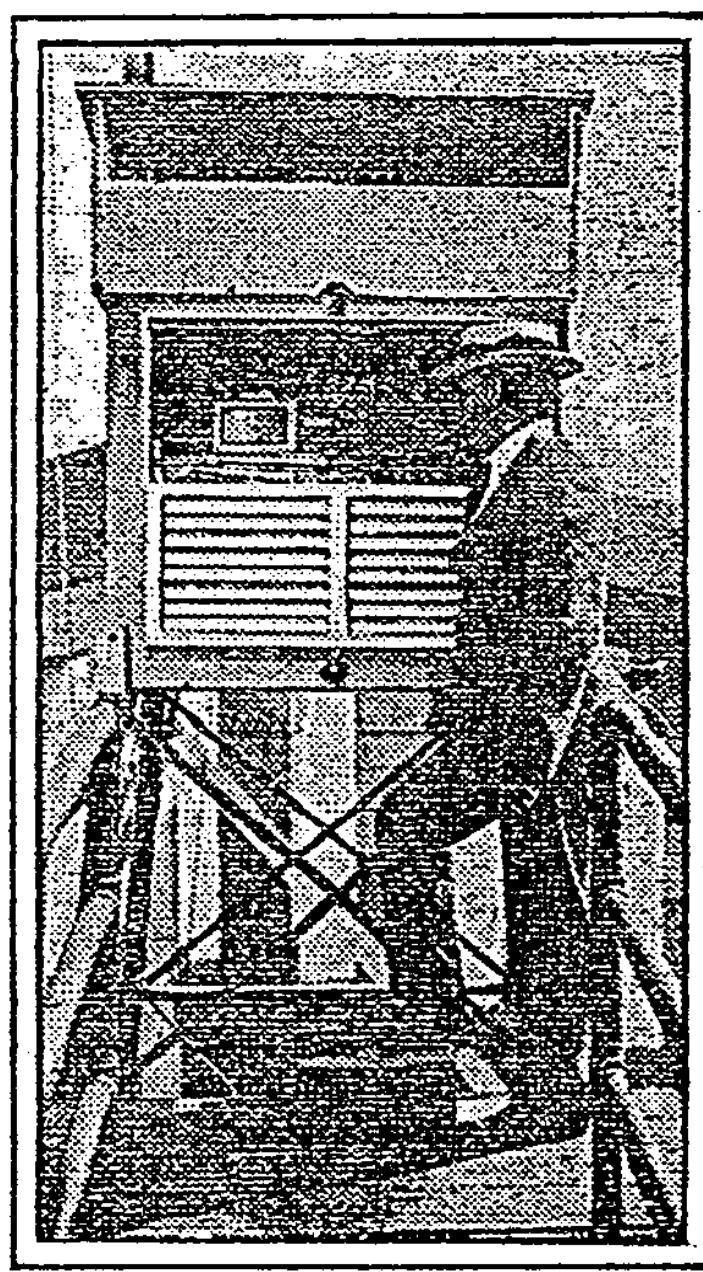
"In other words, within reasonable limits the greatest degree of bodily comfort will be sensed with wet-bulb temperatures ranging from 65 to 70 degrees. Carrying the illustration further, if the air temperature rises to 100 degrees, the wet-bulb remaining at 70 degrees, the relative humidity would have dropped to 21 per cent.

"I tell you this in some detail because there is a very widespread impression abroad that air temperatures in the sunshine and in the shade are quite distinctly different. A moment's thought about this will convince one that such a thing could not be true. Suppose air at temperature of 80 to be moving at the rate of ten miles per hour. How much would its temperature change in passing through a streak of sunshine the width of the street?"

Mr. Scarr pointed out of the window on the twenty-first floor of the Whitehall Building, 17 Battery Place, overlooking the park, and said:

"How much does the air lose in temperature in passing through the shadow of that flag pole in Battery Park?"

"It is true that bodies exposed to the



Near View of the New Instrument Which Mr. Scarr Is Testing. (Photo Janet M. Cummings.)

pecially to those who have been on a farm at any time of their lives, and have seen the method of keeping cream cool, or have noticed, for instance, how water was placed in a canvas bag, that objects are cooled by the process of evaporation; the amount of cooling depending upon the rapidity with which evaporation takes place, and that, of course,

direct rays of the sun absorb more or less heat (insolation) and themselves become warmer than the surrounding air. But air temperatures do not differ materially, whether in the shade or in the sunshine. It is often complained that temperatures recorded by the Weather Bureau are not comparable with those experienced by the man in the street. The actual difference as registered by an accurate thermometer is very much less than seems to be generally believed.

"On some of the hottest days this Summer, men have been sent from the office of the Weather Bureau with tested thermometers to take temperatures on the street in different parts of the city—at the Post Office, in Wall Street, and such places. When such temperatures have been taken in the shade of buildings, or in the middle of the street, the thermometer being shaded from the direct rays of the sun by the body or hat of the observer, differences exceeding one or two degrees have rarely been found. And those differences," added

Mr. Scarr, with a good-natured and rather slow wink, "have not always been what the critic in the street might call 'in favor of the Weather Bureau,' either. Sometimes, in other words, the figures are lower than the bureau's."

While Washington is the weather bureau centre, whence local reports are received, the New York bureau, while but a branch, is the most important in the country, because of its vast commercial interests. The present head of the New York bureau did not, as a young man, have much faith in the forecasting profession, he admitted the other day. He used to teach school, and once started a newspaper in the West.

"Does the department err frequently?" Mr. Scarr was asked.

"We err, but not frequently," he replied. "There is no bureau in the world more accurate, more comprehensive. We cannot direct the course of a storm, we cannot rule the winds, but in nine hundred and ninety-nine thousand cases out of a million we can tell which way they

are going and so warn the public hours in advance. It is true we make mistakes. We are only human and the elements—well, when humanity is pitted against the warring elements, our best efforts, supplemented by science, go awry.

"Our principal mistakes, however, are due to one cause. We forecast by States, covering the entire State. Frequently a portion, a small portion, of the State is just outside of the edge of a storm. It escapes. The remainder of the State doesn't. You see, the trouble is that the weather man, with all his wisdom and reports, cannot keep a storm within the State limits."

"Is there anything that he can do about all this humidity?" Mr. Scarr was asked.

"Some of the readers of THE TIMES will doubtless remember Saunders's Old Third Reader," replied the Weather Man. "If so, they will recall a story about John Hasty and Caleb Careful. Caleb said: 'Keep cool, John, keep cool.'

"Weather is a perfectly harmonious

result of natural laws, hence we may agree with Ruskin that there is no bad weather—just different kinds of good weather. The weather will be what it will be. When the people of New York think they have the worst sort of weather, they should remember that it won't make conditions seem any better to indulge in complaints and emphasize the temporary discomforts. The Weather Man doesn't really make the weather, and our estimate of what the weather conditions really are often depends as much upon the state of one's physical condition as it does upon actual meteorological conditions.

"I think, in short, that it should be consoling to the people of New York, who think they are having a hard time with the heat, to remember Mark Twain's classic comment about Winter in India. He said there was no such thing—that the people in India spoke of it to differentiate between weather that would melt a brass door knob and the kind that would only make it mushy."

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