partly cloudy, and cloudy weather, but there was so little difference in shape and location of the several curves, that all observations were used for each month, regardless of the state of the sky.

The records of the office were then searched for all predicted minimum temperature during the past five years. Minima are predicted only when frost or near-frost temperatures are expected, and such predictions are seldom made on Sundays, because few or no reports are received Sunday mornings. In all, there were found 57 cases in which a definite prediction of the minimum temperature was made. The error between this predicted temperature and the actual minimum was then taken for each case. The relative humidity and the dew point at the noon observation were then consulted and the departure of the temperature indicated by the curve from the actual minimum was taken for each case.

The actually predicted minimum was within 4° of the real minimum 36 of 57 times, or 63 per cent. The minimum indicated by the dew-point humidity curve showed exactly the same percentage of accuracy. This was for the 57 special cases only, when the degree of cold was of real importance. If minimum temperatures were predicted by the curve every day, the average percentage of accuracy would be considerably greater.

The average error, taken regardless of sign, of the temperature forecast from the a. m. weather map was 4.1. The average error of the temperature indicated by the dew-point humidity curves was 4.3, nearly the same. Considering plus and minus departures, it was found that the minimum temperature was below the curve-indicated temperature 27 times, with an average minus departure of 4.4. It was above 24 times, and exactly equal 6 times. Incidentally, this almost equal distribution of plus and minus departures furnishes a fair check on the accuracy with which the curves were drawn.

Taking the temperatures actually forecast from the weather map, it was found that the real minimum went lower than the predicted minimum only 14 times out of the 57, and the average minus departure was only 1.9°. This was undoubtedly due to a conscious intention on the part of the forecaster to predict a temperature just a little lower than he actually expected.

Going back now to the last serious freeze experienced in this locality, we find that the temperature forecast for Tampa on the morning of February 2, 1917, for the morning of February 3 was 25°, and the actual minimum was 26°. This was before the mean solar noon observations were begun, but computations from corrected hygrograph readings applied to the curve, show that the minimum indicated by the curve would have been 33°. Estimating the minimum temperature in this case 7° too high would have been a calamity.

It would seem that for this particular locality, when the minimum temperature is of real importance and not merely of scientific interest, it may be estimated from the 8 a. m. weather map more accurately than it can be indicated by dew-point humidity curves from observations at noon. But these noon readings may be useful in checking or confirming the minimum forecast, and it may be possible to develop a correction curve based upon the barometric gradient that would be of practical value.

NOTES, ABSTRACTS, AND REVIEWS.

Paul Frederick Maxwell (1892-1923).

Paul Frederick Maxwell, in the strength and vigor of early manhood was overwhelmed by a snowslide on one of the steep slopes of the denuded area of the Wagon Wheel Gap, Colo. Experiment Station on March 5, 1923. When his body was found 5 hours later life was extinct. Mr. Maxwell left camp about 9 a. m. to make the regularly scheduled snow depth and density measurements on the denuded watershed. Not returning at the expected time his companions at the camp, Messrs. Weld and Torrence immediately set out in search of him. On arriving at the B-area they saw that a snowslide had occurred on what is known as "Snowstake area B-11;" and when they found snowshoe tracks leading to the slide their worst fears were realized. An hour's search failed to reveal the body, but finally the heel of a snowshoe was discovered projecting from a snow bank at the bottom of the slide, and the body was soon uncovered. Slowly and with difficulty the body was borne back to the camp, arriving there at 7:30 p. m., a little less than 12 hours from the time of his departure in the morning.

Mr. Maxwell entered the service of the Weather Bureau in 1916, and had seen service at North Head, Wash.; Boston, Mass.; and New Haven, Conn. From the last-named station he was transferred to Wagon Wheel Gap and was in his second year of duty at that station.

Snowslides have occurred in both watersheds at the Wagon Wheel Gap project while yet in timber due to the very great angle of the slopes, 35° in places. With the removal of the timber from the B-area the hazard of slides greatly increased and this fact was fully realized by the observers, who, nevertheless, with a fidelity that is extremely gratifying, carried on under these circumstances.

It was the writer's privilege to have known Mr. Maxwell personally and to have discussed with him the observational material of the project. His mind was keenly alive to the problems involved and he gave his best efforts toward their solution.

His memory will be treasured by his associates in the Weather Bureau as one who made the supreme sacrifice, just as truly as did those who gave up their lives on the scarred battlefields of France and Belgium. Mr. Maxwell is survived by his parents, Mr. and Mrs. W. D. Maxwell, of Baker City, Oreg., and by his wife and three small children. To all of these, his associates in the Weather Bureau extend their deep and lasting sympathy in the loss sustained by this tragic event.—*A. J. H.*

WARMER AIR IN REAR OF CYCLONE OF FEBRUARY 8, 1923.

The morning weather map for the United States, February 8, shows a depression of the barometer accompanied by the usual cyclonic wind circulation centered over the Great Basin. Immediately in the rear of the cyclone center is the legend "Warmer 20 degrees." The orthodox temperature distribution in cyclones which visit the United States is warm in front and cold in the rear; it is well known, however, that this distribution does not hold for the Pacific coast and the northern Plateau regions. The present case is of sufficient interest to warrant a few words of explanation.

On February 7 an anticyclone, sea-level pressure, 30.40 inches, occupied the region in question, but, by the next morning, it had vanished and the identical region was occupied by a cyclone as above mentioned. The

area immediately to the westward marked "Warmer" aroused my interest, and the observers at the two stations, Modena, Utah, and Winnemucca, Nev., have kindly supplied data of hourly temperatures, wind directions and velocities for the 24 hours ending with 8 a. m. 75th meridian time, February 8, 1923.

From these data it is inferred that the influence of the sea-level pressure distribution upon the speed of the wind was practically nil. The approaching cyclone, however, caused a shift in the wind from the east on the early morning of the 7th to west and southwest during the later hours of the 7th. The winds from the east were cold with temperatures at zero F. and below. With the shift of the wind into a westerly quarter on the 7th temperature rose sharply and to greater heights than had been attained on any of the preceding 4 or 5 days, although each of these days was free from clouds that might have intercepted the incoming solar radiation. One result of the high temperatures of the 7th was that the gain during the daylight hours was maintained during the night so that the minimum temperature on the morning of the 8th was 20° F. higher than on the immediately preceding morning; therefore, that which appears on the daily weather map as an area of "warmer 20 degrees" was in reality a failure of the night temperatures to sink to the low value of the preceding nights. It would be interesting, of course, to know what was the cause of the failure of the night temperatures to sink to the accustomed level of the period immediately preceding. A few clouds were observed at one of the stations about sunset of the 7th and the vapor pressure increased during that date to a maximum on the 8th. The rise in temperature on the 7th was clearly due to insolation unobstructed by any clouds whatsoever. At Winnemucca temperature rose from zero to 43° F. in 6 hours; at Modena from −9 to 36 in 10 hours. The opportunity for rising temperature on any of the five days preceding the 8th was evidently as great as on that date. Anticyclonic weather prevailed, however, and the slight gain by day was lost by night radiation to the sky. The interesting question arises what constituent of the atmosphere is responsible for checking the nocturnal radiation to which attention has has been called?—*A. J. H.*

TEMPERATURE AND MORTALITY IN NEW YORK CITY.[1]

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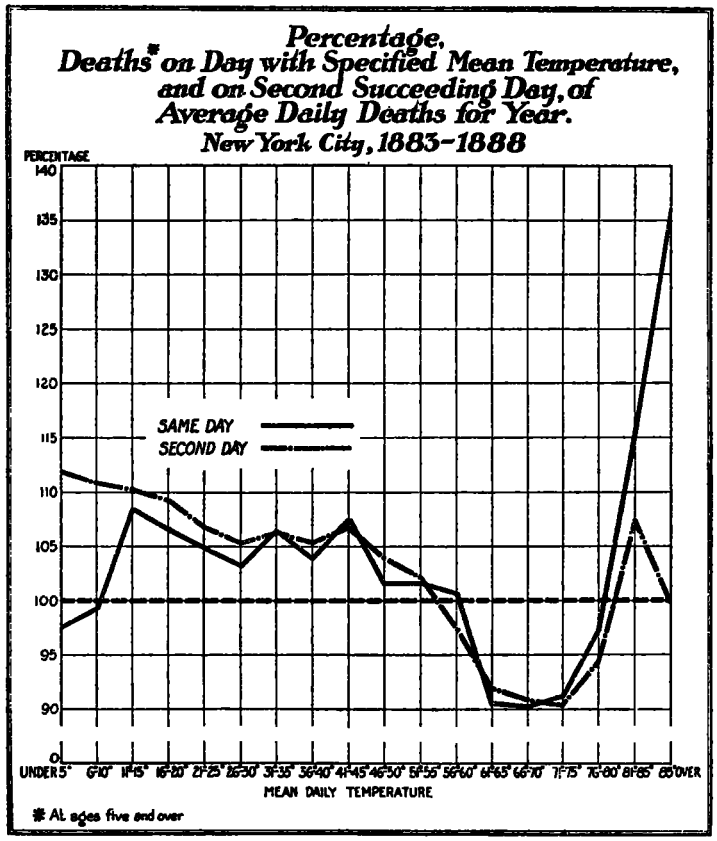
Three or four decades ago weather records were commonly published in conjunction with mortality data. This was due to a widespread conviction that the weather is the chief cause of seasonal variations in disease. Then came not only a new appreciation of the importance of nutrition, but also Pasteur's discovery of the fundamental part played by bacteria in disease. Investigators, medical men and public health officials were so impressed by the wonderful improvements in health which became possible through proper food and the control of bacteria that they almost overlooked the effects of the atmosphere. Lately, however, there have been signs of a revival of interest in the effect of weather and climate, and there seems to be good prospect of a return to a more balanced condition where the control of nutrition, parasitic organisms, and atmospheric environment will play more nearly equal parts in the world's campaign for health.

One sign of this change is the appointment by the National Research Council of a committee on the atmosphere and man. This committee has secured the cooperation of the New York City Department of Health and various life insurance companies in an investigation of the relation of the weather to deaths in New York City. For this purpose, the data for six years from 1883 to 1888 were chosen. That seems to be going back a long way, but, strange to say, those are the latest years for which statistics of daily deaths appear to be available in published form for any large city of the United States. Daily statistics are essential to any thorough understanding of the effect of the weather.

One phase of the joint investigation involves a study of the relation of deaths to temperature. The first



question to be answered was: How do the deaths vary at different temperatures? The crude materials that bear on the answer to this question are given in the following table. The 2,170 available days of the 6 years under discussion have there been divided into groups according to temperature. There were 5 days when the average temperature in New York City for day and night together was only 5° F. or less, 15 days with a mean temperature of 6° to 10° F. and so on up to the largest group containing 238 days when the thermometer averaged from 66° to 70°. The figures in the other columns show the deaths among persons over 5 years of age, expressed in percentages of the daily average deaths for the year in which each day with a given temperature occurred. The column marked 0 indicates the relative number of deaths, as thus defined, on the days when a given temperature prevailed, the next column shows the relative deaths one day later, and so on up to the thirteenth day.

[1] A preliminary report from the committee on the atmosphere and man, National Research Council.