

being added to the daily report. This addition, by an arrangement with the telegraph company, can be made without increasing the expense of the report. At some of the corn and wheat region stations referred to a column is added to the bulletin giving the road conditions, but in some cases where this is not feasible a separate card bulletin is issued. At other stations the information is obtained from correspondents who are furnished with franked postal cards and make daily reports by mail, the information contained thereon being summarized at the central station, published on the daily bulletins, and otherwise distributed. The mail reports are supplemented by reports by telephone or telegraph, at Government expense, as occasions may require, on the occurrence of unusual conditions. The correspondents are largely persons connected with State highway commissions or interested in automobile traffic, and serve without compensation.

AERIAL WEATHER FORECAST SERVICE IMPROVED.

[Reprinted from Aerial Age Weekly, New York, Aug. 18, 1919, p. 1048.]

WASHINGTON, D. C.—The Weather Bureau * * * has prepared a map of the United States divided into 13 zones, for which forecasts are to be made for aviators and balloon pilots. These forecasts are made twice daily, at 9:30 a. m. and 9:30 p. m., and cover conditions for the succeeding 24 hours.

Since July 21, forecasts have been made with the country divided into seven zones, with such satisfactory results that the number of zones has been increased to 13.

The Air Service has sent out the revised map to their active stations throughout the country and the forecast

will be forwarded at the time made,¹ it being intended that all cross-country fliers shall be advised of the weather conditions before starting on any contemplated flight, thereby reducing * * * to a minimum the liability of injury to aviators, balloon pilots, passengers, and property, as far as weather conditions are concerned.

PLANT TEMPERATURES.

[From Annual Report of the Director of Bureau of Standards, year ending June 30, 1916, pp. 92-93.]

As a result of inquiries by botanists and agronomists concerning the transmission, reflection, and temperature of growing leaves and methods for determining the same, experiments were made on methods of making temperature measurements with needle-pointed thermocouples of fine (0.05 mm.) wires inserted into the ribs or petiole of a leaf. Data on transmission and reflection have been published in Scientific Paper No. 196, Diffuse Reflecting Power of Various Substances. The temperature measurements are relative values, which fluctuate very rapidly with every breeze that blows. In quiet air, in the shade, the thick succulent stem of a burdock leaf was 3.5° C. below the room temperature (below the temperature of the water in which it stood), while the leaf was only 0.5° C. below. Similarly leaves of other plants were 0.2 to 0.5° C. below the room temperature. In the sun, however, conditions were different. The cooling by transpiration of water is not rapid enough in comparison to the rate of absorption of solar energy. The temperature of a growing plantain leaf exposed to the sun was 5 to 6° C. higher than the air temperature.

¹ It is expected that arrangements soon will be made for the press services to handle these forecasts, for publication in newspapers located in the regions where flying is more or less general.

PRECEPTS FOR FORECASTING RIVER STAGES ON THE CHATTAHOOCHEE AND FLINT RIVERS OF GEORGIA.

By C. F. VON HERRMANN, Meteorologist.

[Dated Weather Bureau, Atlanta, Ga., Aug. 8, 1919.]

GENERAL SUMMARY.

Preliminary investigation has shown that there does not seem to be a very definite correlation between the river stages at upper and lower river stations on the Chattahoochee and Flint Rivers, and that a scheme for forecasting flood stages could not be based on gage relations, at least without a very extended and time-consuming investigation. This probably results from the fact that the rains over the watershed of these two rivers frequently approach from the west or southwest, covering the lower courses first, and later advance to the upper watershed; although the reverse operation also takes place. In general, then, although the rise in the river may seem continuous at any point, the curve graphically representing the rise is in reality complex, resulting from the combination of two or more curves at different phases. Occasional use is made of gage relations in general, since the limit of a possible rise may be determined for each river gage by the crest stages at the upper stations, and especially between the two lower stations on the Flint-Albany and Bainbridge, and the two lower stations on the Chattahoochee-Eufaula and Alaga. This matter will, however, be made the subject of a separate investigation when time permits. In order, therefore, to complete a practical scheme for forecasting river stages another plan was followed, the principle of which may be described as follows:

It is evident that in every case and under all conditions the stage of a river must be a function of the rainfall over the watershed above the station. That is, for any station a factor may be found which will give the probable rise in the river in feet on the river gage corresponding to an average rainfall of 1 inch over the watershed. But this factor will necessarily be modified by many different causes, some of them of permanent character (which need not be considered) and others of fluctuating character which determine the various different rises due to nearly the same amount of precipitation. These fluctuating factors are, for example, the irregular distribution of rainfall, the rapidity of fall, the previous condition of the ground (or level of the ground waters), temperature conditions, initial stages, effect of water released from power dams, and many others.

The study required the untangling of these different factors in order that each might be given its proper value or weight in the rules for forecasting. Nevertheless the number of rules should be kept to the smallest possible minimum in order not to defeat the aim of the river forecast scheme, to enable the forecast official quickly to determine the probable stage of a river from telegraphed rainfall reports. A too minute dissection of rules would defeat this purpose.

The factor or rise in feet for each inch of precipitation will, of course, be different for each river station. Its value depends primarily on the nature of the bank at the