but those in the lower Arkansas and the rivers of southern Mississippi and western Alabama were very pronounced and destructive, especially in southern Mississippi.

The flood in the lower Arkansas River and tributaries was caused by the heavy rains of May 23 and 24, and flood stages were reached generally on May 25. The crest stage at Fort Smith, Ark., was 26.6 feet on May 27, 4.6 feet above the flood stage; at Little Rock, Ark., 23.5 feet, on May 29, 0.5 foot above flood stage; and at Pine Bluff, Ark., 27.0 feet, on May 30, 2.0 feet above flood stage. The losses amounted to about $300,000, of which two-thirds was in crops, while the value of property saved by the flood warnings was about $60,000. Damage to lands by erosion amounted to about $12,000.

The southern Mississippi and Tombigbee River floods resulted from the excessive rains that began about May 24, and before they subsided in early June some very high stages had been recorded. At Jackson, Miss., on the Pearl River the crest stage was 35.3 feet on May 30, 15.3 feet above the flood stage; at Columbia, Miss., 27.0 feet on June 5, 7.0 feet above the flood stage; at Enterprise, Miss., on the Chichasawhay River, 36.0 feet on May 27, 18.0 feet above flood stage and the highest water of record; at Merrill, Miss., on the Pascagoula River, 25.1 feet on June 4, 5.1 feet above flood stage; at Demopolis, Ala., on the Tombigbee River, 51.1 feet on June 11, 16.1 feet above the flood stage; and at Tuscaloosa, Ala., on the Black Warrior River, 51.6 feet on June 5.

About 70,000 acres of lowlands along the Black Warrior and Tombigbee rivers were inundated, and the losses in Alabama and Mississippi amounted to about $980,000, divided as follows:

| | |
|---|---|
| Crops | $600,000 |
| Property other than crops | 150,000 |
| Damage to farm lands | 30,000 |
| Suspension of business | 200,000 |
| Total | $980,000 |

The value of the property saved through the Weather Bureau warnings was about $55,000, a small amount when compared with the losses, but representing nevertheless, all that there was to save at this season of the year.

The losses during the Allegheny River flood on May 1 and 2 amounted to $65,000, and the value of property saved by the Weather Bureau warnings was about $75,000.

The annual rise of the Missouri and Columbia rivers set in during the month, but no flood stages were reported. The Ohio River rise resulted in stages close to the flood stage, and on May 13 passed into the Mississippi River, where the crest stages were also close to the flood stage. At the end of the month the river was still rising at New Orleans, La. The upper Mississippi River was comparatively quiet at stages that are to be expected at this time of the year.

The highest and lowest water, mean stage, and monthly range at 217 river stations are given in Table IV. Hydrographs for typical points on seven principal rivers are shown on Chart I. The stations selected for charting are Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Missisipi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.—*H. C. Frankenfield, Professor of Meteorology.*

## SPECIAL ARTICLES, NOTES, AND EXTRACTS.

### A BALLOON AMONG THUNDERSTORMS.

By CHARLES J. GLIDDEN. Dated Pittsfield, Mass., May 25, 1909.

Aeronauts in the balloon *Massachusetts* that ascended from Pittsfield on the afternoon of May 24, 1909, had an unusual experience. At an elevation of one mile and thirty minutes after the start, three showers and thunderstorms were noticed, one in the Hoosic Valley, another in the Connecticut, and the third near Worcester. The balloon rose and fell through intervals varying from 1,000 to 10,000 feet, and several times was caught in varying currents which caused the basket to turn and swing from side to side. Under one mile elevation the balloon traveled in advance of one of the storms at a speed of about forty miles an hour, while at an elevation of 10,000 feet calm and sunshine prevailed with the storm rapidly passing below them. Lightning flashes were frequent and heavy peals of thunder shook the basket. After the storms had passed under the balloon a rift in the clouds enabled the aeronauts to drop down into a clearing free from clouds and to make a landing without difficulty. This established the fact that above the storm there existed bright sunshine and no wind.

### THE 24-HOUR DAY.

By CHAS. A. MIXER, C. E. Dated Rumford Falls, Me., July 17, 1909.

The letter from Mr. Clayton in the March number of the REVIEW, dated June 28 and received to-day, viz, on the adoption of the Kelvin thermometer scale and the metric system, interests me. I wish to approve his recommendation and to add a suggestion intended to complete the recommendation. Really it is a repetition rather than a suggestion, for I have written of it before, but not recently. It is, Adopt the 24-hour time. For seventeen years I have been using the 24-hour day; not alone in my weather records but primarily in all the hydraulic and electric records of our business. It is very easy for even untrained workmen to adopt and use the 24-hour time, and to use it with less error than the 12 hours with A. M. and P. M. With the 24-hour system, "10:40 hr." can mean only one time in the day. It is as easy to write and to think "16-hr." as it is "4 P. M."

Within two weeks I have read in the newspapers that the Russian Government has adopted the 24-hour time. I do not now remember the paper and can name no authority, but I was glad to read of the adoption.

### A SIMPLE APPLICATION OF THE THEORY OF PROBABILITIES TO WEATHER PREDICTION.

By C. E. VAN ORSTRAND. Dated Washington, D. C., June 15, 1909.

In the present state of meteorological science, it is recognized that precise predictions of weather conditions for moderate intervals of time are impossible. This imperfection of the science is due to many causes, the most important of which is the uncertainty in both velocity and direction of the approaching storm. Since the forecaster must necessarily take these and other uncertainties into account, it would seem that the most logical method of procedure would be to state the prediction in terms of probabilities in order that the forecaster may more accurately take into account the various factors of the problem; and thus be able to give to the public, in a definite statement, all of the specific information which science is capable of yielding for a particular weather condition; and no more.

This requirement may be met, in a way, by stating the prediction in terms of two scales, each on a basis of 10. On the first scale is represented the probability of the predicted phenomena, and on the second, the estimated amount or intensity. Suppose, for example, that a prediction is to be made on the rainfall in a given area. The maximum rainfall in twenty-four hours is represented by 10 on the second scale of the diagram (Fig. 1); one-half the maximum by 5, and so on to 0, which means no precipitation. On the probability scale, 10 means certainty, probability unity; 5 means an even chance,