

zontally by the wind. In the four experiments at St. Louis in the month of September all descended within fifty miles of St. Louis. In ten ascents during November and December the balloon traveled much farther, reaching 200 miles from St. Louis. In general it would seem that even in midsummer, at altitudes above four miles, there are perpetual freezing temperatures, and an upper air current blowing steadily from the west. The Blue Hill Observatory is again to be congratulated on the energy it shows in the matter of upper air observations, and it is to be hoped that Mr. Rotch will be able to continue the balloon work at St. Louis. Many such stations will be needed in order to perfect our knowledge of the atmosphere over the United States.—*C. A.*

TRAILS OF METEORS.

A newspaper clipping from Portland, Oreg., says:

Residents of the Knob Hill district going home last night (December 21, 1904), shortly after 6 o'clock were startled by the appearance out of the cloudy air of a meteor with a trail of fire behind it, flying close over the city, apparently not over 150 feet above them. It was glowing red and threw out sparks behind like the tail of a comet.

The quotation relates to a phenomenon that would give us much information about the upper atmosphere if only the observers would give us a more exact account of what they saw. The smokelike trail left behind by a meteor is undoubtedly higher up in the air than any altitude attained by balloons, and the changes that it undergoes must be supposed to depend, at least in part, on the atmospheric conditions in its neighborhood. What the meteorologist wants is a sketch, as exact as possible, of the location of the trail among the stars. Several successive sketches, stating the moments of time, and the apparent angular altitude, and the bearing or azimuth, would give us the basis for some calculation as to atmospheric influences. When several observers happen to see the same meteor from different points of view, their separate sketches of the trail would give us still more interesting results. A large collection of data of this kind has been made by Mr. W. P. Trowbridge of Columbia University, New York, N. Y., and every additional sketch would be highly valued by him.—*C. A.*

DARKNESS AT MEMPHIS.

From a newspaper clipping we learn that on December 2, about 10 a. m., a dark pall covered Memphis for about fifteen minutes. The sunlight was wholly cut off by a dense cloud and the darkness of night prevailed. Of course artificial light was used and business temporarily paralyzed, but the light returned as suddenly as it went. We are told that in some quarters a panic prevailed, and that some were shouting and praying, imagining that the end of the world had come. A similar darkness frequently attends a heavy local cloud, and is a common attendant upon prairie and forest fires and upon volcanic eruptions; everyone is familiar with the accounts of the great darkness attending the fogs that prevail in London during the winter season, and with less intensity in New York, Philadelphia, Chicago, and other large cities where soft coal is used.

Every intelligent person understands that such darkness gives no occasion for superstitious fears. However, we must recognize the fact that there are some in every class, ignorant or educated, American or foreign, rich or poor, who are liable to loose self control when anything very unexpected occurs. A panic is almost as easily precipitated among men, women, and children as it is among herds of animals. For the Weather Bureau men it should be a proud record that they have stayed many panics by words of assurance and a cool bearing. We ought never to forget that every natural phenomenon has a natural cause, and requires to be considered and treated calmly. No matter what the impending disaster, the first requisite is to preserve one's self-possession and help others to do the same.—*C. A.*

FLOOD ON THE SOUTH CANADIAN RIVER, IN OKLAHOMA AND INDIAN TERRITORY, OCTOBER 1-4, 1904.

The Canadian River rises in eastern New Mexico and flows across the panhandle of Texas into Oklahoma and Indian Territory, where it joins the Arkansas. In the preceding number of the MONTHLY WEATHER REVIEW, page 466, we published an account of the floods in New Mexico due to heavy rains in that Territory from September 26-30. The resulting flood during the first days of October on the Grand River, below the point where it enters Oklahoma, is described in detail by Mr. C. M. Strong, Section Director, in the October and November reports of the Oklahoma and Indian Territory section of the Climate and Crop Service of the Weather Bureau. That the flood originated in the mountains of New Mexico is shown by the fact that only in that State were there any heavy rains on the Canadian River basin between September 25 and October 4. Mr. Strong states:

The flood of the South Canadian River of October 1 to 4, 1904, will stand memorable as the most destructive one in the history of this section since its settlement. To thoroughly understand its destructive effects one must have a knowledge of the topographical features of that stream.

Finding its source in the mountain ranges of New Mexico, it thence meanders southeastward across the high uplands of the Texas panhandle to the fertile plains of Oklahoma, and on through the Indian Territory to its connection with the Arkansas River.

Throughout its course its bed lies inclosed in a wide valley, whose bottom levels are but slightly above the surface of the stream. Its waters are usually shallow, of small width, and to a large extent are underground throughout the year, the usual width of the surface stream varying from 60 to 200 yards.

Previous to the flood the river valley was covered with fertile farms from its entrance into Oklahoma to its mouth in the Indian Territory, rich with fields of cotton, corn, and wheat.

Conceive in your mind this beautiful and fertile valley, rich in the finest products of the earth, and then turn to the results following the flood.

The feeble stream, winding its way in a shallow bed, became a vast flood that rolled a wall of water eighteen to twenty feet deep, in places spreading from hill to hill, with width varying from one to two miles, sweeping everything from its path and covering the valley with sand from one-half to four feet in depth, completely obliterating everything in the form of vegetation.

The force of the water was so tremendous that nothing could stand in its course; crops, bridges—both iron and wooden—trees, and houses were swept away like straws and swallowed up in the sands. The roar of the waters was heard for miles on either side, like that of the sea.

The scene along the full course of the river beggars description. The fertile valley is to-day practically destroyed, and its heretofore valuable farms are worthless, as the sand with which they are covered can never be removed. Many of the farmers are left destitute, nothing of any value remaining after the flood.

The flood originated in the mountains of New Mexico, and in successive waves swept the full course of the river, indicating that terrific cloud-bursts were the cause of the phenomenon.

During the progress of the flood over this section the weather was generally clear and pleasant, alleviating to some extent the suffering that was caused to the people made homeless by its destructive effects.

The nearest estimate that can be made of the damage caused is as follows: Loss to personal property, crops, and bridges, \$600,000; loss to farms by overflow, \$3,000,000.

At Stone, Okla., where before the flood there was merely a dry bed of sand about half a mile wide, the river attained a depth of twelve feet and width of two miles. At Bridgeport, Okla., the river rose slowly all day on the 1st, and by the morning of the 2d was six feet above the normal. It continued to rise slowly on the 2d, and at 5 a. m. on the 3d a wave eight feet high struck the railway, washing out three-fourths mile of embankment on the Choctaw Railroad and one and one-half miles on the Rock Island Railroad. Thirty quarters of 160 acres each were covered with sand to a depth of from two to four feet, and some are completely washed away. The following table is based on reports from postmasters and others at the places mentioned.

The distances given in the second column are obtained by measurements on a postroute map, following the windings of the river as closely as practicable. According to the contour map of the U. S. Geological Survey, the elevations on the