

Range of mountains. The main stream, after receiving a number of tributaries rising to the southward in the Raton Mountains, empties into the Arkansas two miles east of Las Animas. Although draining 3040 square miles, the stream normally carries very little water; in fact, it is almost dry in its lower part, especially during summer and autumn.

In Colorado rain set in over the drainage area on the 27th and continued until the afternoon of the 30th. Along the Arkansas the fall was generally between one and two inches, while on the watershed of the Purgatoire, in Huerfano and Las Animas counties in Colorado, and in northern New Mexico it ranged from about four inches in the western part of Las Animas County to nearly six inches in the vicinity of Trinidad, and to about seven inches near the headwaters of the tributaries rising in the Raton Mountains in northern New Mexico. The entire upper watershed being a mountainous region, the run-off was great and rapid.

At Trinidad, where the flood was most disastrous, the loss probably reached \$600,000. The river rose very rapidly; at 2 a. m. of the 30th it went over its banks, and at 3:30 a. m. it had spread a block or more on each side. Every bridge in the city, except one, was carried away; the Santa Fe railroad station was demolished, and 30 city blocks along the river were covered from two to four feet deep. The electric light and gas plants were flooded, leaving the city in darkness. The railroads sustained a large loss by washouts and a prolonged interruption to traffic. Ranchmen along the river for 50 miles or more lost their crops; in some instances they sustained considerable loss by the cutting done by the flood, and in others sand ruined much valuable farming land.

Before the flood in the Purgatoire reached the Arkansas that stream was somewhat swollen as a result of the rains, but the volume carried did not exceed 3000 second-feet. The great volume brought by the Purgatoire caused the Arkansas to leave its banks and attain a height equal to the high-water mark reached about 40 years ago. All bridges between Las Animas and the State line, except one at Granada, were washed out; bottom lands were badly washed or covered with sand; long stretches of railroad track were carried away or undermined, the damage being estimated at \$200,000. At Lamar, about 30 miles east of the mouth of the Purgatoire, the flood stages were first noted about 6 a. m., October 1, and the water continued to rise steadily until 4 p. m. At the highest stage the river was fully one and a half miles wide. The river subsided slowly from that time until Tuesday, when it was again at its normal stage.

#### RECENT FLOODS IN THE RIO GRANDE VALLEY.

By W. H. ALEXANDER, Observer, Weather Bureau, Galveston, Tex.

The continuous and at times heavy rains that fell over western and southwestern Texas and southeastern New Mexico during September and the early part of October, 1904, kept the Rio Grande on the verge of overflowing its banks at various places along its course during this entire time, and on several occasions, and at a number of places it did overflow and flood the valley. The property loss in Texas on account of these overflows seems not to have been very great, but the inhabitants of the valley were kept in a state of constant alarm.

On the 8th of September the river observer at Eagle Pass, Tex., sent the following message to points below:

River up seven feet and rising. Heavy rains reported above here.

On the 14th the following:

River now up sixteen feet, and rising six inches per hour. Eight a. m.

On the 15th the following:

Twenty-two feet. Slowly rising. Continued light rains here.

On the 16th the following:

Reached twenty-four feet last night. Now falling.

From gage readings kindly furnished by Mr. W. W. Follett,

United States Consulting Engineer, El Paso, Tex., it appears that the river at El Paso gradually rose from September 1 to 15, after which a gradual fall began. The highest reading recorded was 14.0 feet in the afternoon of the 15th.

Another series of readings from a gage located near Devils River Station, Tex., shows a gradual rise in the river from September 5 to 10, and a very rapid rise from the 10th to the 15th. The maximum reading recorded at this station was 28.1 feet on the afternoon of the 14th and the forenoon of the 15th. Gage readings at Fort Ringgold, Rio Grande, Tex., show that the river at that point rose from 20 feet on the 10th to 30 feet on the 16th, and then began to fall.

The postmaster at Delrio, Tex., advises that the river at that point overflowed its banks on the 12th and 13th of September to a depth of seven feet, the water extending from 300 to 700 yards from the river bed, and causing an estimated property loss in that immediate vicinity of \$500.

At Rio Grande, Tex., the river overflowed its banks from September 16 to 22, resulting in the complete destruction of all crops planted along the river valley and a number of small shacks or huts. The crops destroyed were largely on truck farms, although a few cotton fields were also destroyed. It is intimated that the losses were heavier farther down the river, but no authentic information relative thereto has been received at this office.

During the last week of September very heavy rains fell in the upper Rio Grande Valley, especially in New Mexico, causing an overflow of the river in the vicinity of El Paso, Tex., and above, resulting in the loss of considerable property, principally railroad property, along the river in southern New Mexico. Just above El Paso a dike gave way and the water spread rapidly across and down the valley, forming lakes and streams, a part finally returning to the river channel. The damage to lands and buildings by reason of this overflow is estimated at \$5000 or less.

On October 15, 1904, the observer at El Paso, Tex., advised the stations below as follows:

No decided rise in surface of river last three or four weeks, but bottom has scoured out until average depth at point of average width appears to be seven or eight feet and water running fast.

The gage readings at El Paso show that the highest stage, 24.0 feet, was reached at 11 p. m. of the 15th of October. No authentic information has been received at this office of damages, if any, resulting from this rise in the river. They are believed to have been unimportant.

#### THE GREAT FLOODS OF SEPTEMBER IN NEW MEXICO.

By J. B. SLOAN, Observer, U. S. Weather Bureau, Santa Fe, N. M. *Revised reprint from Report for September, 1904, New Mexico Section of the Climate and Crop Service of the Weather Bureau.*

Between the 26th and 30th of September very heavy, steady rains fell over nearly the entire Territory, causing the most extensive and destructive floods in its history. The greatest damage occurred on Thursday morning, September 29, over the eastern slopes of the mountains and along the valleys and lowlands of the northern portion, but the floods were nearly as destructive over the eastern slope of the several mountain ranges in the southwest portion, and over the Hondo basin in the southeast. The reports from the voluntary observers show that from three to seven inches of rain fell in twenty-four to forty-eight hours, extending over an area about three hundred by five hundred miles. It is simply impossible to conceive the volume of water which this means; millions of tons, all rushing toward the sea, down the steep canyons and rapidly decreasing slopes of the valleys, carrying death and destruction in its path, for nothing placed by man can withstand the onward rush of the flood waters. An eye witness of a portion of the flood gave a vivid description of the meeting of the Mora and Sapello rivers, about a quarter of a mile above Watrous, in the following words: