average of all winds. During the dry season a much higher rain probability is presented by the south to west-northwest winds, evidently because atmospheric disturbances are accompanied by these winds.

TABLE 15.—*Wind direction and rain.*

| 1906. | Wet months. | | | Dry months. | | |
|---|---|---|---|---|---|---|
| Regardless of wind directions, rain hours, per cent of all hours | 14.7 | | | 10.9 | | |
| Group of winds | NW to NE. | ENE to SSE | S to WNW | NW to NE | ENE to SSE | S to WNW |
| Winds, per cent of all winds | 14.0 | 58.6 | 25.6 | 6.3 | 89.6 | 2.2 |
| Rain hours, per cent of all rain hours | 16.8 | 53.2 | 23.2 | 6.8 | 87.5 | 4.4 |
| Rain hours, per cent of all hours of the special wind group | 17.6 | 13.3 | 13.3 | 11.9 | 10.6 | 21.6 |

The northwest to northeast winds change remarkably from one season to the other. During the wet season they are the rain-bringing winds as they come from the high seas; but during the dry season they are dry and therefore seem in fact to be trade winds which are shifted by the sea breeze and come from the north.

## WEATHER NOTES FROM PUERTO PLATA, DOMINICAN REPUBLIC.

By R.J. TOTTEN, U. S. Consul. Dated Puerto Plata, D. R., August 14, 1909.

The Tacajo Cacao and Sugar Company, whose banana plantation lies at Sosua in the province of Puerto Plata, has published from time to time a series of weather notes. From these notes the following summary for the fiscal year, July 1, 1908–June 30, 1909, has been compiled.

The total rainfall for this period was 110 inches, distributed as follows:

TABLE 1.—*Monthly rainfall at Puerto Plata, D. R.*, 1908–9.

| 1908. | | 1909. | |
|---|---|---|---|
| | *Inches.* | | *Inches.* |
| July | 6.75 | January | 20.90 |
| August | 1.45 | February | 8.35 |
| September | 19.75 | March | 1.85 |
| October | 6.90 | April | 1.35 |
| November | 12.90 | May | 8.05 |
| December | 13.85 | June | 7.90 |

The average monthly rainfall was 9.16 inches. The heaviest rainfall registered in any one day was 9.10 inches on September 10, 1908.

The highest temperature recorded during this period was 94° F., on July 12, 1908, the lowest was 62°, on January 19, 1909. The maximum and minimum temperatures recorded in each month follow:

TABLE 2.—*Monthly temperature extremes at Puerto Plata, D. R.*, 1908–9.

| 1908. | Max. | Min. | 1909. | Max. | Min. |
|---|---|---|---|---|---|
| | °F. | °F. | | °F. | °F. |
| July | 94 | 77 | January | 81 | 62 |
| August | 93 | 80 | February | 80 | 70 |
| September | 92 | 73 | March | 86 | 71 |
| October | 86 | 78 | April | 86 | 74 |
| November | 85 | 76 | May | 87 | 74 |
| December | 84 | 72 | June | 87 | 70 |

The average mean temperature for the year was 79° F.

The prevailing winds are east-northeast and are commonly known as "Local Trades." Average velocity of wind 6 miles per hour.

The highest recorded barometer reading was 30.45 inches, the lowest was 28.25 inches.

## CHANGES IN THE MONTHLY WEATHER REVIEW.

In the issues of the MONTHLY WEATHER REVIEW for February and March, 1909, we published in full all the pertinent parts of orders issued by the Chief of the U. S. Weather Bureau, outlining changes which he planned to make in the character of the REVIEW beginning with the issue for July, 1909. At the beginning of the announcement in the issue for February the following statement was made:

> It appears from the following that those readers particularly interested in *climatological statistics* should request that the REVIEW be continued to their addresses; those who are more interested in theoretical and technical discussions of data should request that the Mount Weather Bulletin be sent them in place of the MONTHLY WEATHER REVIEW.

It appears that there are many who have not read these notices and outlines of prospective changes, and the Weather Bureau is still frequently requested to renew or add to its subscription list recipients who apparently do not realize the character of the new publications.

Our readers are therefore informed that beginning with the issue for July, 1909, the MONTHLY WEATHER REVIEW will be restricted to statistical tables of general climatological data for the whole of the United States. The relatively small amount of accompanying text will summarize the weather conditions of the month in the different districts. It is thus evident that hereafter the REVIEW will be of value only to those advanced students of climates, engineers, etc., who need detailed data for their own discussion.

Few papers of general interest to teachers, except as related to climatology, will be published in the MONTHLY WEATHER REVIEW, and it is not probable that the publication will be of value to those public schools and high schools that have been receiving it heretofore. These circles of readers must now turn to the editors of already existing journals to supply their needs along those lines formerly met, perhaps, by articles in the MONTHLY WEATHER REVIEW.

We may here also take the opportunity to remark that the scope of the articles appearing in the Mount Weather Bulletin will be limited to technical treatments of subjects of advanced research. This will make most of the articles of that publication also beyond the comprehension of the average pupil of the above grades of schools, and make the Bulletin only appropriate for the libraries of colleges and universities.—*C. A.*

## TORNADOES IN MISSOURI.

On April 29 a very destructive tornado passed through Golden, Barry County, killing nineteen or twenty persons and injuring about eighteen others. Property amounting to nearly $20,000 was destroyed within the village and probably as much more along the route of the storm northeastward to Viola, Stone County, where two or three persons were killed and nine seriously hurt. A number of citizens saw the approaching storm and describe it as resembling the smoke of a railway engine. It was not accompanied by rain or hail. Nearly all the trees blown down by the tornado fell in the direction whence it came, the trees to the southwest being badly battered and bruised as usual. Chickens were picked of their feathers and some were torn to pieces. It is reported that the large amount of atmospheric electricity present increased the difficulties of telephoning to Golden.

Another tornado visited Alton, Oregon County, on this same date, destroying most of the buildings of the town and killing six persons.—*C. A., jr.*

## TORNADO AT ANNISTON, ALA.

By W. F. CLARK, Assistant Observer. Dated Anniston, Ala., May 8, 1909.

On April 13, 1909, at about 3 a. m., a small tornado traversed Calhoun County, Ala., from southwest to northeast, passing

within two miles northwest of the regular observing station at Anniston, Ala. At that point there is a negro settlement of one-story houses, called "Camp Shipp," occupying the northerly and easterly ridges and the bottom of a small vale between hills to west, north, and east thereof. This vale is from forty to sixty rods wide between the crests of the ridges from east to west, and eighty rods long from north to south. It opens towards the southwest upon a tract of gently rolling farm land bare for a half mile or more to both west and south, while the enclosing ridges are depressed slightly at the northeast corner of the little vale. In the lowland along the base of the westerly wooded slopes the houses were not injured. Others, however, slightly farther to eastward were moved four or five feet from their foundations, carrying with them large brick-fireplace chimneys built up from the ground. Passing northeastward, the tornado unroofed buildings here and there for six miles or farther.

One man, living next east of the Wilson house, was just returning from work, and was on the Buttermilk Road only ten rods east of the tornado vortex when it struck the Wilson house and crossed the road in front of him. He was running directly into the vortex to get to his home, and to get out of the rain, which came down with great intensity and suddenness close to the storm center. The tornado approached from the south with a roar, "like a freight train crossing a bridge," and passed to northeast out of hearing. He was at first blown across the road to the fence by a violent blast of wind from the south. This was followed almost immediately by violent atmospheric surges from the west, which continued for some time. Between these blasts he rose from the ground, ran across to the south side of the road and clung to his fence, working his way along a couple of rods to the gateway and to the verandah a couple of steps back, where he stood for some minutes afraid to open the doorway through fear that his house might be unroofed. He observed no hail. There was much thunder and lightning. Owing to the darkness and his exciting experiences he did not observe whether there was a funnel cloud. No one was injured.

At this station, two miles to the southeast, the highest wind velocity was 31 miles from the southwest at 2:48 to 2:53 a. m. At this time the reduced barometer reading, which had been 29.78 inches for two hours, rose ten hundredths of an inch in fifteen minutes. The temperature rose slowly from 63° at 11 p. m. on the 12th to 66° at 2:40 a. m. on the 13th, and then fell to 53° in fifteen minutes. Precipitation had been very light, barely sprinkling or misting from 3:45 p. m. on the 12th till 2:40 a. m. on the 13th, but fell at an excessive rate from 2:40 to 2:46 a. m., heavy till 3:30, and light till 7:45 a. m. Moderate to brisk southeast winds had prevailed for two days, but with the passage of the vortex the winds changed from southeast at 2:47 a. m. to south, southwest, and west in five minutes and to northwest in nineteen minutes, diminishing rapidly thereafter to light after 3:30 a. m.

During the passage of this tornado up the little vale between the hills of Camp Shipp, its path for eighty rods was due north. Along this path the wind effects indicate that the vortex was characterized by two violent wind forces at right angles to each other, one from the south on the right of the vortex, and the other from the west just in rear of the vortex, both of them surging in violent waves and performing the destructive work that levelled trees and buildings. It would thus appear that the southeast wind that prevails before tornadic storms feeds into the front of the tornadic vortex in a steady stream that does no destructive work, while the northwest wind that prevails after the tornado has passed by feeds into the vortex in violent surging, destructive waves, as a west wind just in rear, as a south wind just on the right of the vortex, and as an east wind on the immediate vortex front. Combining here with the southeast wind on its right, the two rise into the vortex as a surging easterly lifting wind of greatly increased force by virtue of the doubling up of the two inflowing wind streams.

## DESTRUCTIVE STORMS IN ALABAMA.

By E. C. HORTON, Assistant Observer. Dated Montgomery, Ala., June 22, 1909.

*April, 1909.*

A violent windstorm occurred on April 30, 1909, in Calhoun County, between 4:30 and 5 p. m. The most damage was caused at Piedmont where the storm appeared as "a rapidly moving, black, low-hanging cloud" with a very high wind from the southwest, rather than a funnel-shaped cloud with a cyclonic whirl. The path of destruction was about one hundred yards wide, but the damage almost entirely confined to Piedmont. Property loss was about $4,000, but no person seriously injured. The resident observer reports that the local topography renders Piedmont liable to high winds over this same path.

About 8 p. m. of the same day a typical tornado passed within one mile of Delta, Clay County, having started four miles west of Pyriton in what is known as Shinbone Valley. The path was ten miles long, toward the northeast, and one-fourth to three-fourths mile wide. Owing to the sparsely settled condition of the country the number of injured persons was but seven, and the property loss did not exceed $6,000.

*May, 1909.*

A tornado occurred in Escambia County, Ala., on May 25, 1909. The storm seems to have been at its worst about 3 a. m. Its path of destruction has been estimated from one-half to 3 miles in width, and about 7 miles long. It seems probable, however, that it came from much farther to the northwest, violent windstorms having been reported the same night or the preceding afternoon at Eutaw, Greene County, and Demopolis, Marengo County; also over a portion of the country lying between Myrtlewood and Linden, Marengo County, as well as at Jones Mill, Monroe County. These places lie in an irregular line northwest and southeast. The places of greatest damage appear to have been Herrington, where the school house was demolished; Hammac, where a church and several houses were blown from their foundations; and the vicinity of Pollard, where much destruction to timber was wrought.

The storm had the usual funnel-shape cloud in at least a part of its course. No loss of life or serious injury to persons was reported from any points in the affected district. The storm was last heard of at Bradley, on the eastern border of Escambia County. At this point the rains, that were heavy throughout the affected district, became a cloudburst.

An accurate estimate of the property loss is not obtainable, but must have been not less than $10,000 or $15,000.

A tornado traversed a considerable portion of Madison and Morgan Counties, in north Alabama, about 5 p. m., May 30, 1909. The storm first struck Cedar Lake, a suburb of Decatur, Ala., where a large congregation were assembled at the colored church. The church was lifted from its foundation and turned completely around. No one was injured, except by being bruised in the mad scramble to get out of the building. Many trees were uprooted and houses were unroofed, and the accompanying rainfall was torrential. At Triana, east of Decatur, several residences were blown down, and both churches badly damaged. Considerable damage to trees, roofs, wires, etc., was done at Huntsville, although the severest part of the storm appears to have passed some distance from that place. At Ryland a church and some other property was damaged. The tornado was last reported at Brownsboro. There a church was lifted from its foundation and lowered to the ground without serious damage to the building. The greatest loss seems to have been to orchards, groves, and fields. While a great many buildings were demolished or damaged, they were