

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table IX, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

Thunderstorms.—One hundred and forty-eight reports of thunderstorms were received during the current month as against 192 in 1897, and 333 during the preceding month.

The dates on which the number of reports of thunderstorms for the whole country were most numerous were: 22d, 40; 20th, 32; 3d, 11; 4th, 11.

Reports were most numerous from South Carolina, 21; Georgia, 18; New Jersey, 18; North Carolina, 18.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, from the 23d to the end of the month.

The greatest number of reports were received for the following dates: 13th, 10; 12th, 6; 18th, 4.

Reports were most numerous from Minnesota, 9; Montana, 8; Ohio, 7.

In Canada.—Auroras were reported as follows: Father Point, 15; Quebec, 6, 18; White River, 14, 28; Winnipeg, 14; Minnedosa, 8, 11, 14, 16, 17, 18, 19; Qu'Appelle, 14, 17, 18; Banf, 14; Prince Albert, 9; Battleford, 14, 16.

NOTES ON THE WEATHER OF THE WEST INDIES.

No serious atmospheric disturbances were observed during the month. Generally tranquil weather, characteristic of the Tropics, was noted at all stations.

Thunderstorms were observed as follows: Colon, 11th; Roseau, 25th; Santo Domingo, 29th.

Rain from clear sky.—The observer at Dominica reports the occurrence of a heavy shower with clear sky overhead about noon of the 16th. His explanation of the phenomenon is that the rain was blown from clouds overhanging the hills near by.

Water temperatures.—The observer at Porto Rico records in his daily journal a number of observations upon the temperature of the water of the bay and ocean near San Juan made on December 16.

The observations were taken at the surface, and the resulting temperature is closely the mean temperature of the air for the year (79°), and considerably higher than the mean temperature for the past week, (76.0°.)

It is interesting to find that the temperature of the long, narrow, black-bottomed channel of San Antonio is the same as that of the open bay. It connects the bay with the small, open harbor of San Antonio where the temperature was higher. It is surprising to find the open mouth of San Antonio warmer than the large bay of San Juan, and the open mouth of the latter colder. The mouths are only 2½ miles apart. San Antonio has heavy reefs outside, but a heavy surf rolls up to the very mouth and small vessels can enter it.

While the sun was unclouded (from 1:10 to 2:29) the air was 1.7° warmer than the water, but when it clouded (from 2:33 to 3:24) it was 2.4° colder.

Summed up, the observations give the following results:

In San Juan Bay proper	10 observations,	mean	78.2
In San Antonio channel	6	"	78.2
In San Antonio harbor	3	"	78.3
At mouth of San Antonio harbor with open sea pouring in. (The depth here is about 10 feet.)	3	"	78.9
Near the mouth of San Juan Bay	2	"	78.0
At mouth of San Juan Bay (off Morro Castle) in the main channel, which is deep	3	"	77.5

CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division.

The following extracts relating to the general weather conditions in the several States and Territories are taken from the monthly reports of the respective sections of the Climate and Crop Service. The name of the section director is given after each summary.

Rainfall is expressed in inches.

Alabama.—The mean temperature was 42.0°, or 2.5° below normal; the highest was 78°, at Bermuda on the 21st, and the lowest, 8°, at Madison on the 14th. The average precipitation was 3.58, or 0.12 below normal; the greatest monthly amount, 8.25, occurred at Elba, and the least, 1.51, at Hamilton.—*F. P. Chaffee.*

Arizona.—The mean temperature was 40.4°, or 4.6° below normal; the highest was 84°, at Champies Camp on the 1st, and the lowest, 21° below zero, at Holbrook on the 13th. The average precipitation was 1.73, or 0.07 above normal; the greatest monthly amount, 5.80, occurred at Tuba, and the least, 0.16, at Music Mountain.—*W. G. Burns.*

Arkansas.—The mean temperature was 39.5°, or 3.9° below normal, the highest was 76°, at Texarkana on the 29th, and the lowest, 4° below zero at Keesees Ferry on the 14th. The average precipitation was 1.87, or 2.89 below normal; the greatest monthly amount, 3.68, occurred at Mossville, and the least, 0.56, at Dallas.—*E. B. Richards.*

California.—The mean temperature was 44.4°, or 2.3° below normal; the highest was 98°, at Tropic on the 2d, and the lowest, 12° below zero, at Boca on the 30th. The average precipitation was 1.20, or 2.77 below normal; the greatest monthly amount, 6.07, occurred at Crescent City, while none fell at Chino.—*W. H. Hammon.*

Colorado.—The mean temperature was 19.5°, or 7.0° below normal; the highest was 68°, at Cheyenne Wells on the 28th, and the lowest, 40° below zero, at Garnett on the 31st. The average precipitation was 0.86, or about 0.14 below normal; the greatest monthly amount, 4.18, occurred at Santa Clara, and the least, 0.08, at Delta.—*F. H. Brandenburg.*

Florida.—The mean temperature was 57.5°, or 3.5° below normal; the

highest was 90°, at Ocala on the 3d, and the lowest, 21°, at Crawfordville on the 27th. The average precipitation was 4.12, or 1.32 above normal; the greatest monthly amount, 11.80, occurred at St. Andrews Bay, and the least, 1.89, at Manatee.—*A. J. Mitchell.*

Georgia.—The mean temperature was 46.6°, or 2.7° below normal; the highest was 80°, at Mauzy on the 30th, and the lowest, 8°, at Diamond on the 15th and at Tallapoosa on the 13th. The average precipitation was 3.79, or 0.18 above normal; the greatest monthly amount, 6.98, occurred at Fort Gaines, and the least, 0.60, at Cartersville.—*J. E. Marbury.*

Illinois.—The mean temperature was 26.8°, or 3.9° below normal; the highest was 64°, at Equity on the 29th and at Cairo and New Burnside on the 30th; the lowest, 12° below zero, at Scales Mound on the 14th. The average precipitation was 1.38, or 0.82 below normal; the greatest monthly amount, 2.78, occurred at Tuscola, and the least, 0.34, at Lanark.—*C. E. Linney.*

Indiana.—The mean temperature was 28.8°, or 4.2° below normal; the highest was 66°, at Marengo on the 19th, and the lowest, 26° below zero, at Cambridge City on the 14th. The average precipitation was 2.23, or 0.53 below normal; the greatest monthly amount, 3.59 occurred at Knightstown, and the least, 0.60, at Valparaiso.—*C. F. R. Wappenhans.*

Iowa.—The mean temperature was 18.1°, or about 5.0° below normal; the highest was 60°, at Wapello on the 29th, and the lowest, 25° below zero, at Estherville, Mason City, and Ruthven on the 31st. The average precipitation was 0.48, or more than 1.00 below normal; the greatest monthly amount, 1.70, occurred at Eldora, and the least, trace, at Mason City.—*G. M. Chappel.*

Kansas.—The mean temperature was 27.8°, or 6.0° below normal; the highest was 66°, at Marion on the 27th, at Oswego on the 28th, and at Fort Scott on the 30th; the lowest was 23° below zero, at Achilles on the 31st. The average precipitation was 1.73, or 0.72 above normal; the greatest monthly amount, 3.62, occurred at Lebo, and the least, 0.29, at Achilles.—*T. B. Jennings.*

Kentucky.—The mean temperature was 34.1°, or 4.2° below normal; the highest was 70°, at Ashland on the 30th, and the lowest, 12°