

U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU,

CO-OPERATING WITH THE

# MARYLAND STATE WEATHER SERVICE



Established by an Act of the General Assembly of the State of Maryland, 1892,  
and Maintained in Connection with

The Johns Hopkins University and the Maryland Agricultural College.

CENTRAL OFFICE, JOHNS HOPKINS UNIVERSITY, BALTIMORE, MD.

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JOHNS HOPKINS UNIVERSITY,  
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U. S. WEATHER BUREAU,  
Meteorologist in Charge.

VOL. IV, No. 6.

MONTHLY REPORT.

OCTOBER, 1894.

## Is Lightning More Destructive to Barns After Harvest Time Than Before?

Inquiry was recently made of this office as to why thunderstorms were more destructive to barns after harvest time than before. The question was referred to the Weather Bureau, Washington, with the suggestion that statistics would show the truth or falsity of the statement, and the following reasons advanced in support of the assertion were also forwarded:

1. Before harvest the stalks of the grass and grain with their many pointed heads, like the trees of the forest, act as conductors of atmospheric electricity and afford protection in some degree to the buildings they surround. After harvest the dry stubble insulates a large proportion of the unwooded surface, and the electric tension is therefore relieved through the buildings as the best conductors afforded by a landscape denuded of trees and crops.

2. The overheated condition of a barn filled with harvested crops makes it a better conductor of electricity than a house or an empty barn, and the lightning seeks it the more quickly.

3. A barn filled with ripe crops is a more inflammable object than a house or an empty barn and is the more likely to be destroyed by fire resulting from a lightning stroke.

The Weather Bureau replied as follows: "It is doubtful whether statistics would throw light upon this question. Certainly the farmer and the whole community notice the destruction of a barn filled with the products of a year's labor more than they would notice the loss of an empty

barn. For this reason all such cases would be reported, while the other might escape. It is proposed in the coming years to pay special attention to this and some other matters. It seems to us that the reasons given above in support of the greater destruction after than before harvest are all likely and not in contradiction with known laws. The second reason, however, is the one thought to be most effective. The heat, which is always to be found with packed hay and other crops, naturally makes a barn or stable warmer than the surrounding space. There is also with the warmth more or less moisture, and there are probably up-rising air currents, not very strong ordinarily, but liable to be accentuated during thunderstorms. Again, it must be remembered that barns are, as a rule, located on hills or hill-sides, and there may exist an air circulation due to topography.

These with the heat generated in the ripening of the crops tend to make a barn stocked more liable to be struck and also more inflammable than an empty one."

## Inspection and Establishment of Meteorological Stations.

On October 1st an observer (A. Tillard Brewer) from the central office visited Jewell, Anne Arundel county, Maryland, and again a meteorological observing station was opened there. Mr. Joseph Plummer, the former observer, kindly consented to take up the work once more, and a report is expected for the month of October.

On the return trip from Jewell the meteorological station at Annapolis, Anne Arundel county, was visited. It was found that the work of taking observations was being carried on in a most satisfactory manner by the observer, Mr. J. E. Abbott.

The wind signal station at Annapolis has proved a great benefit to the many people engaged in the oyster industry, and from all accounts the warnings telegraphed by the Weather Bureau have already saved property and lives.

To show the appreciation of the warnings by the Annapolis people, the following paragraphs (City Council Proceedings) recently published in the *Evening Capital*, of which Mr. Wm. M. Abbott is the editor, are quoted:

#### PETITIONS.

From C. W. Martin & Co., James I. Johnson, Russell & Co., C. A. DuBois, oyster packers, and a number of tongers, asking that a flag-pole be placed near the harbor for displaying the wind and weather signals received daily from Washington.

#### ORDERS.

That \$25, or as much as may be necessary, be appropriated to purchase and erect a flag-pole to display the weather and wind signals; passed.

OBSERVER G. N. WILSON visited the voluntary observing stations at Oakland and Cumberland, Md., during the latter part of September, and reports that the work is being carried on in a most satisfactory manner by Dr. J. Lee McComas and Messrs. Howard and E. T. Shriver. He opened a station at Deer Park, with Mr. P. S. Specht as observer, and another at Western Port, with Prof. O. T. Bruce, Superintendent of Public Schools, as observer.

### West Indian Hurricane of September 24 to 29, 1894.

[From Storm Bulletin No. 2 of 1894, issued by the U. S. Department of Agriculture, Weather Bureau.]

Tropical storms of the type to which this disturbance belongs generally move leisurely westward over the Caribbean Sea or the West Indian Islands, recurve slowly at some point between the Bahamas and the west portion of the Gulf of Mexico, and pass thence northeastward toward Newfoundland, the longitude of their recurve and their subsequent course being apparently largely controlled by the distribution of atmospheric pressure and temperature over the United States and the west part of the Atlantic Ocean. The exceptionally destructive nature of many of these storms has prompted the Weather Bureau to a special study of their characteristics and

habits, and the almost absolutely accurate forecasts made of the character and movements of destructive disturbances of this class during the last two years have been of incalculable value to individuals and representatives of marine and coast interests who profited by the ample and timely warnings which were widely distributed by telegraph throughout the storm-swept districts.

The West Indian cyclone which has visited our southern coasts during the past week is the first storm of this class of the present season, and was reported in the vicinity of Martinique, one of the Windward Islands of the West Indies, the night of the 20th. From that time the disturbance was closely watched as it followed its westward course over the Caribbean Sea, but the widely separated stations of observation prevented an exact determination of its intensity until the morning of the 24th, when the center was approximately located about 200 miles southeast of Key West. On the morning of the 21st, however, a warning of the presence of the storm in the Windward Islands was sent to Nassau, Bahama Islands, and the afternoon of the 22d the following dispatch was sent to observers along the Atlantic coast from New York to Jacksonville:

Reports from Habana and Key West indicate that the cyclone passed some distance to the south of Porto Rico this morning, and that it appears to be of small dimensions, and moving slowly westward. Latest advices indicate it is central near or over San Domingo.

Give notice to shipping interests, especially to vessels bound southward.

DUNWOODY.

The morning of the 23d, warning of a West Indian storm approaching Cuba was sent to New Orleans, Pensacola, Savannah, and Jacksonville, and in the evening observers in Florida were ordered to notify postmasters by telegraph of the approach of a destructive storm. Northeast storm signals were hoisted at all Florida stations except Jacksonville, and information signals were displayed on the Gulf coast and at Jacksonville; and notice of the movements of the hurricane was sent to observers on the Atlantic coast from New York to Wilmington, and to the New York and Philadelphia Maritime Exchanges.

The morning of the 24th it was evident that the storm possessed considerable energy, and it was also apparent that it would hold to a westerly course and recurve in the longitude of western Cuba or the Florida Peninsula. This movement would occasion dangerous gales on the west Cuban and south Florida coasts. Northeast signals were ordered from Port Eads to Pensacola and from Jacksonville to Wilmington, and information signals were displayed northward to Newport News. In the afternoon the following dispatch was sent to observers at Mobile, Montgomery, Meridian, New Orleans, Atlanta, Augusta, and Savannah:

The hurricane now central near Habana is approaching the west Florida coast. It will probably cause dangerous gales, high tides, and heavy rains in Georgia, Alabama, southern Mississippi, and southeast Louisiana by Tuesday night or Wednesday morning. Notify postmasters.

DUNWOODY.

At 12 noon, 24th, the following message was sent to observers at Savannah, Savannah section, and Charleston:

Severe storm central over west Cuba and now causing dangerous gales over south Florida. Direction of movement uncertain. Not safe for any vessel to leave port. Distribute information widely, and notify coast islands of possible high tides.

DUNWOODY.

Special warnings were also sent to postmasters in South Carolina, and the observer at Norfolk was instructed to prevent, if possible, the sailing of any vessel southward, as dangerous gales were indicated on the North Carolina coast by the morning of the 26th. The night report located the storm center near Habana moving northwest. At Key West the barometer stood at 29.38, with a maximum wind velocity of sixty miles per hour.

The morning of the 25th the storm was central near Key West, with pressure 29.12, and a current wind velocity of twenty-eight miles per hour from the southwest. Northeast storm signals were continued on the south Atlantic and Florida coasts, and were ordered as far north as Newport News, and the following message was sent to observers from Boston to Baltimore and to the New York and Philadelphia Maritime Exchanges:

The West Indian hurricane has reached southern Florida, causing violent gales in that section, and is now moving to the northeast. Dangerous gales are anticipated for the south Atlantic coast to-night, and it is not safe for vessels to leave northern ports for the south. Further information will be telegraphed as the storm advances.

DUNWOODY.

At 12.18 p. m. the following message was sent to the observers at Jacksonville, Savannah, Charleston, Titusville, and Tampa:

Storm central in southern Florida and will probably move northeast, causing dangerous gales and unusually high tides along the Florida, Georgia, and Carolina coasts. Notify postmasters, and spare no expense to distribute information to places on the coast.

DUNWOODY.

Similar messages were sent to postmasters in exposed localities on the Georgia and Carolina coasts.

By the morning of the 26th the hurricane center had advanced to northeast Florida. Storm signals were continued on the east Gulf and south Atlantic coasts, and information signals were displayed northward to New York City. At 10 a. m. the following message was sent to observers at Raleigh, and at coast stations from Norfolk to Nantucket:

Tropical hurricane central this morning in northern Florida, apparently moving northeast, will cause dangerous gales and high tides on the coast to-night and Thursday. Notify postmasters.

DUNWOODY.

Similar warnings were sent to the commanding officer at Fort Monroe, Va., and to exposed localities along the middle Atlantic and south New England coasts, with request to distribute the information. In the evening northeast signals were ordered from Baltimore to Boston, and the observer at Norfolk was instructed to hold vessels in port, as the hurricane center was between Charleston and Savannah, and dangerous gales and high seas were prevailing off the south Virginia coast. In the evening a wind velocity of 88 miles per hour was reported at Tybee Island.

At 2.40 a. m., of the 27th, the lowest barometer noted in connection with this storm, 29.11, was observed at Charleston. At 8 a. m. the hurricane was central a few miles north of Charleston. Northeast storm signals were changed to southeast from Wilmington to Newport News, northeast signals were continued from Baltimore to Boston, and information of the progress and character of the storm was telegraphed to the Maritime Exchanges in Philadelphia and New York, and to observers on the south New England coast. The evening of the 27th, the storm was central near Wilmington, and had lost energy during the preceding twelve hours; but dangerous gales and high tides were indicated along the immediate coast from Hatteras to Nantucket.

During the next twenty-four hours the storm remained nearly stationary on the North Carolina coast, where it is now central, apparently diminishing in energy.

The following messages from observers in the districts visited by the storm indicate the destructive character of the hurricane and the value of the warnings to shipping and other interests:

JACKSONVILLE, FLA., *September 28, 1894.*

Hurricane warnings widely distributed. No damage to shipping. No seagoing vessels left port; all tied up securely or sought safe anchorage. Some sailing vessels would undoubtedly have been lost had they not heeded warnings. Greatest interest taken. Office visited constantly Wednesday by persons seeking latest storm news.

SAVANNAH, GA., *September 28, 1894.*

Passenger steamships *City of Augusta*, for New York, and *William Crane*, for Baltimore, and several sailing vessels detained. No vessel left port after warning. All vessels in port secured. Towboat and lighterage companies took extraordinary precautions securing property. Rice growers suffered little loss. At least 10 lives probably saved.

CHARLESTON, S. C., *September 28, 1894.*

Entire community praises Bureau loudly, and say grand achievement of science in tracing tropical visitor so minutely. No vessels left port during Tuesday, Wednesday, and Thursday; many lives saved. Warnings of great value to rice interests. Damage slight. All shipmasters protected property. Goods in city moved long before storm tide arrived. One million dollars worth of property saved.

WILMINGTON, N. C., *September 28, 1894.*

British cotton steamer, Clyde Line steamer, revenue cutter, lighthouse tender, and sailing vessels remained in river till this morning. No casualties reported. Rice growers enabled to take such precautions that no damage is known

to have resulted. Many cottagers on beach moved to town all safe. Schooner *Beasley* went ashore on Frying Pan Shoals a total loss; crew saved by life-saving crew.

NORFOLK, VA., *September 28, 1894.*

Thirteen line steamers, one hundred and forty coasting vessels, and a hundred small craft obeyed warnings. Twenty coasting vessels ready to proceed to sea were held, and estimate that they were saved. One hundred and thirty thousand dollars worth of property saved from high tide. Agents of the Old Dominion, Clyde, and Merchants and Miners' lines wish to be quoted: "Words inadequate to express saving of life and property by your warnings."

Special reports were not called for from coast stations north of Norfolk, but doubtless a large number of vessels were also detained in the northern ports as the result of the warnings.

Special midday bulletins were issued to the press each day from the 24th to the 27th, inclusive, giving the location and probable movement of the storm.

H. H. C. DUNWOODY,

*Acting Chief of Bureau.*

WASHINGTON, D. C., *September 29, 1894.*

### Miscellaneous Notes.

[MEMORANDUM.]

U. S. DEPARTMENT OF AGRICULTURE,  
WEATHER BUREAU,

*Washington, D. C., September 25, 1894.*

The paragraph below, from an act of Congress approved August 8, 1894, is furnished officials in charge of stations to be used by them in such a manner as they may find best calculated to acquaint the public in their vicinities generally, and particularly persons who may be likely to violate the law, with the existence of the enactment and the penalty of its transgression. It is believed that newspapers would gladly publish the paragraph.

"Any person who shall knowingly issue or publish any counterfeit weather forecasts or warnings of weather conditions, falsely representing such forecasts or warnings to have been issued or published by the Weather Bureau, United States Signal Service, or other branch of the Government service, shall be deemed guilty of a misdemeanor, and, on conviction thereof, for each offense, be fined in a sum not exceeding five hundred dollars, or imprisoned not to exceed ninety days, or be both fined and imprisoned in the discretion of the court."

H. H. C. DUNWOODY,

*Acting Chief of Bureau.*

### Weather of October and November at Baltimore in past years.

The following data, compiled from the Weather Bureau records at Baltimore, Maryland, for the past 23 years, for the months of October and November, should prove of value

and interest in anticipating the more important meteorological elements, and the range within which such variations may be expected to keep.

*October.*

#### TEMPERATURE.

Mean or normal temperature, 58°. The warmest month was that of 1881, with an average of 63°. The coldest month was that of 1888, with an average of 51°. The highest temperature was 89° on the 30th, 1873, and on the 3rd, 1879. The lowest temperature was 30° on the 16th, 1876, and on the 26th, 1879. Average date on which first "killing" frost occurred in autumn, November 4th.

PRECIPITATION (rain and melted snow).

Average for the month, 2.97 inches. Average number of days with .01 of an inch or more, 10. The greatest monthly precipitation was 6.51 inches in 1885. The least monthly precipitation was .16 inch in 1874. The greatest amount of precipitation recorded in any 24 consecutive hours was 3.42 inches on the 19th and 20th, 1873.

CLOUDS AND WEATHER.

Average number of clear days, 12; partly cloudy days, 11; cloudy days, 8.

WIND.

The prevailing winds have been from the northwest. The highest velocity of the wind was 45 miles from the east on the 23rd, 1878.

*November.*

#### TEMPERATURE.

Mean or normal temperature, 47°. The warmest month was that of 1881, with an average of 49°. The coldest month was that of 1873, with an average of 41°. The highest temperature was 78° on the 12th, 1879. The lowest temperature was 15° on the 22nd, 1880. Average date on which first "killing" frost occurred in autumn, November 4th.

PRECIPITATION (rain and melted snow).

Average for the month, 3.15 inches. Average number of days with .01 of an inch or more, 10. The greatest monthly precipitation was 6.85 inches in 1877. The least monthly precipitation was .65 inch in 1882. The greatest amount of precipitation recorded in any 24 consecutive hours was 2.85 inches on the 23rd and 24th, 1877.

The greatest amount of snowfall recorded in any 24 consecutive hours (record extending to winter of 1884-5 only) was 1.2 inches on the 26th, 1888.

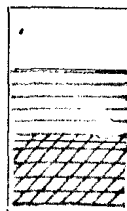
CLOUDS AND WEATHER.

Average number of clear days, 10; partly cloudy days, 11; cloudy days, 9.

# MAP OF MARYLAND AND DELAWARE

SHOWING  
THE PRECIPITATION  
AND  
LINES OF MEAN TEMPERATURES  
FOR SEPTEMBER, 1894.

Scale of Shades:



0 TO 2 INCHES.

2 TO 4 "

OVER 4 "

SCALE OF MILES.



SEPT. 94  
THE PRECIPITATION OF 1894

J. B. Forrester

# Meteorological and Weather Signal Display Stations of the Maryland State Weather Service.

Stations.	County.	Meteorological Observer.	Displayman.
Annapolis .....	Anne Arundel .....	J. E. Abbott.....	W. M. Abbott.
Appleton .....	Cecil .....		W. C. Henderson.
Bachman's Valley.....	Carroll.....	J. M. Myers.	
		G. N. Wilson.	
		J. H. Donaldson.	
Baltimore .....		A. T. Brewer.	
		Ass't Editor of Monthly Report.	
		R. C. New.	
		Ass't Editor of Weekly Bulletin.	
Benedict .....	Charles .....	Thomas Berry.	
Bel Air .....	Harford .....		N. N. Nock.
Bel Alton .....	Charles.....	Walter Cox.	
Boettcherville .....	Allegany.....	F. F. Brown.	
Bradshaw .....	Baltimore .....		B. F. Taylor.
Buckeystown .....	Frederick .....		A. W. Nicodemus.
Cambridge .....	Dorchester .....		Samuel Leman.
Charlotte Hall .....	St. Mary's .....	J. Francis Coad.	
Cherryfields .....	St. Mary's .....	J. Edwin Coad.	
Chestertown .....	Kent .....	Hon. M. deK. Smith.	
Cumberland .....	Allegany .....	Howard Shriver.	
		E. T. Shriver.	
Darlington .....	Harford .....	A. F. Galbreath.	
Delaware City, Del.....	New Castle.....		W. E. Reybold.
Denton .....	Caroline .....	F. C. Ramsdell.	
Dickerson .....	Montgomery .....		W. H. Dickerson.
Distributing Reservoir, D. C .....		Col. G. H. Elliot.	
Dover, Del.....	Kent.....	Jno. S. Jester .....	Philip Burnet.
Easton .....	Talbot .....	Henry Shreve .....	Henry Shreve.
Edgemont .....	Washington .....	Chas. Feldman.	
Fallston .....	Harford.....	G. G. Curtiss, A. M.	
Fenby .....	Carroll .....	Wm. Fenby.	
Frederick .....	Frederick .....	McClintock Young .....	W. T. Delaplaine.
Frederica, Del .....	Kent.....		Miss E. V. Newnom.
			Miss L. T. Frazier.
Garey P. O.....	Howard .....		Walter Dorsey.
Glyndon .....	Baltimore .....		J. J. Dyer.
Grantsville .....	Garrett .....	J. S. Miller .....	T. H. Bittinger.
Great Falls.....	Montgomery .....	Col. G. H. Elliot.	
Hampstead .....	Carroll .....		H. H. Meals.
Hartiy, Del.....	Kent.....		Miss C. A. Forde.
Havre de Grace .....	Harford .....		W. S. McCombs.
Kenton, Del .....	Kent.....		W. S. Arthurs.
Kirkwood, Del.....	New Castle.....	J. S. Carnagy.	
La Plata .....	Charles .....	J. S. Turner .....	J. S. Turner.
Laurel, Del.....	Sussex .....		E. D. C. Hegeman.
Lonaconing .....	Allegany .....		J. J. Robinson.
Mardela Springs .....	Wicomico .....	A. E. Acworth .....	L. A. Wilson.
Marshall Hall .....	Charles .....	F. H. Deal.	
McDonogh .....	Baltimore .....	H. Pender.	
Middletown .....	Frederick .....		G. C. Rhoderick, Jr.
Milford, Del .....	Kent.....	J. Y. Foulk .....	J. Y. Foulk.
Millsboro, Del .....	Sussex .....	Rev. L. W. Wells.	
Mt. St. Mary's.....	Frederick .....	J. A. Mitchell, A. M .....	Jos. H. Martin.
Newark, Del.....	New Castle .....	Wm. H. Bishop.	
New Market .....	Frederick .....	Miss Margaret D. Hopkins.	
Oakland .....	Garrett .....	J. Lee McComas, M. D.....	J. L. McComas, M. D.
Odenton .....	Anne Arundel .....		E. B. Watts.
Princess Anne .....	Worcester .....	Jas. R. Stewart.	
Pocomoke City .....	Worcester .....	R. M. Stevenson .....	R. M. Stevenson.
Pope's Creek .....	St. Mary's.....	George Dent.	
Receiving Reservoir, D. C .....		Col. G. H. Elliot.	
Rising Sun.....	Cecil .....		E. A. Reynolds.
Rockville .....	Montgomery .....		Emmett Dove.
Salisbury .....	Wicomico .....		L. W. Gunby.
Seaford, Del.....	Sussex .....	H. L. Wallace .....	H. L. Wallace.
Smyrna, Del.....	Kent.....		A. D. Yocum.
Snow Hill.....	Worcester .....		Purnell & Vincent.
Solomon's .....	Calvert .....	W. H. Marsh, M. D.	
†Sparrow's Point .....	Baltimore .....		Md. Steel Co.
Sunnyside .....	Garrett .....	John G. Knauer.	
Sykesville .....	Carroll .....		J. S. Hyatt.
Upper Marlboro .....	Prince George's.....	J. B. Perrie.	
Washington, D. C .....		S. W. Beall.	
West Friendship .....	Howard .....		Postmaster.
Westover .....	Somerset .....		E. D. Long.
Wilmington, Del.....	New Castle .....	F. C. D. McKay .....	Wm. Lawton.
Woodsboro .....	Frederick .....		G. F. Smith.
Woodstock .....	Howard .....	T. J. A. Freeman, S. J.	
*Birdsneest, Va.....	Northampton .....	C. R. Moore.	
*Cape Charles, Va.....	Northampton .....	O. A. Browne.	
*Norfolk, Va.....	Norfolk .....	Jas. J. Gray.	
*Warsaw, Va.....	Richmond .....	C. H. Constable.	

\*Stations of the Virginia State Weather Service. †Whistle signals only.

## WIND.

The prevailing winds have been from the northwest. The highest velocity of the wind was 48 miles from the south on the 18th, 1891.

## Review of the Month—September.

## LOW AND HIGH AREAS.

On the 1st a well defined high area was lying nearly stationary over the eastern part of the United States, its center being near Maryland and Delaware. Very little change occurred in the position and form of the area until the 5th and 6th, when it separated into two portions, a shallow depression appearing between them. Local rains resulted, and the temperature, which had remained nearly stationary and normal since the beginning of the month, began rising. The two portions of the "high" immediately rejoined, making the whole a very long area, which extended, on the night of the 6th, from southern Florida to northern Canada. This area was unstable, however, and it again separated into two portions, the northernmost giving place to a depression, or storm, from the southwest, and the other settling down over the south Atlantic and east Gulf states. The depression passed northeast to the Gulf of St. Lawrence on the 8th and 9th, and another "low" from the Northwest followed on the 10th. As a result of the breaking up—beginning on the 5th—of the great area of high pressure and the passage of the areas of low pressure, above mentioned, local rains occurred in Maryland and Delaware from the 5th to the 10th, and the temperature during this time was considerably above the normal.

From the 11th to 14th the weather was dominated by another high area from the West, and there was the consequent absence of rain with lower temperature. On the 15th and 16th the area moved eastward and local rains and warmer weather occurred. These rains and the higher temperature continued until the 20th as the result of areas of low pressure from the South and West.

On the 20th and 21st a high area moved from the Southwest over the middle and south Atlantic states, and its presence was the cause of the dry weather until the 23rd. The temperature was higher than the normal, doubtless on account of the previous southerly position of the area.

On the 23rd a storm passed over the Lake Region to the Gulf of St. Lawrence, but it only served to keep the weather warm. No rain fell on account of the northerly path of the "low."

The last mentioned storm was succeeded by a great area of high pressure, which kept the weather fair until the 27th. This date marked the coming of the severe West Indian hurricane, a history of which has been given under its own heading. Local rains occurred until the close of the month as a result of its transit.

**Temperature** (degrees).—Monthly mean (for the entire territory covered), 69.2, being 2.3 above the normal; highest monthly mean, 73.8, at Solomon's; lowest monthly mean, 61.2, at Oakland; highest temperature, 99, at Charlotte Hall, on the 10th; lowest temperature, 29, at Sunnyside, on the 25th; mean monthly range, 48.6; greatest local monthly range, 59, at Sunnyside; least local monthly range, 40, at Pocomoke City; monthly mean maximum, 77.7; monthly mean minimum, 60.4.

**Precipitation** (in inches).—Average, 3.17, being 0.59 below the normal; greatest amount, 8.89, at Newark, Del.; least amount, 0.96, at La Plata.

An examination of the table of daily precipitation will bring out more clearly the remarkable variation in the amount of rainfall. Throughout a considerable portion of southern Maryland scarcely any rain fell, while in parts of Delaware and northern-central Maryland there was more than twice the average amount.

**Wind**.—Prevailing direction, southwest. Total movement in miles, Philadelphia, Pa., 6967; Baltimore, Md., 4731; Washington, D. C., 4044; Norfolk, Va., 5707.

**Thunderstorms**.—At Bachman's Valley, on the 9th, 16th, 17th, 18th; at Baltimore, on the 8th, 9th, 16th, 17th; at Cumberland, on the 7th, 9th, 15th, 16th, 26th; at Dover, Del., on the 16th, 17th; at Fallston, on the 8th; at Frederick, on the 5th, 8th, 9th, 15th, 16th, 17th; at Mardela Springs, on the 6th, 8th, 9th, 10th, 17th; at Millsboro, Del., on the 8th; at Mt. St. Mary's, on the 16th, 17th, 18th, 27th; at Newark, Del., on the 8th; at Oakland, on the 10th, 15th; at Princess Anne, on the 8th, 19th; at Sunnyside, on the 7th, 16th, 18th; at Taneytown, on the 5th, 6th, 7th, 16th, 17th, 18th; at Wilmington, Del., on the 8th, 10th; at Woodstock, on the 8th, 9th, 16th, 17th.

**Frost, light**.—At Bachman's Valley, on the 25th, 26th; at Boettcherville, on the 26th; at Cumberland, on the 26th; at Grantsville, on the 25th; at Oakland, on the 24th; at Sunnyside, on the 25th, 26th; at Taneytown, on the 25th, 26th.

**Frost, killing**.—At Grantsville, on the 26th; at Oakland, on the 26th.

**Halos**.—Solar, at Cumberland, on the 16th.

**Halos**.—Lunar, at Baltimore, on the 8th; at Cumberland, on the 16th.

**Coronæ**.—Lunar, at Millsboro, Del., on the 12th.

**Auroras**.—At Millsboro, Del., on the 24th, 25th.

**Fog, light**.—At Millsboro, Del., on the 3rd, 4th, 6th, 7th, 18th, 22nd, 23rd.

**Fog, dense**.—At Princess Anne, on the 1st, 3rd, 4th, 5th, 6th, 7th, 8th; at Sunnyside, on the 2nd, 11th.



## CROPS.

*Week ending September 3rd, 1894.*

Throughout the entire State growing crops, generally, are suffering from the protracted drought. Little wheat has been sown, owing to dry and cool weather. Corn looks well and is ripening fast; some farmers will begin putting it in shock during the present week. Fodder is being saved and the yield is fairly good. Sweet potatoes are of large size, owing to the dry weather. Tomatoes have improved, and canneries are being worked to their fullest capacity. Pastures have revived in the south of the State. Some farmers are cutting tobacco. Peaches are all gone, except those of the Smock variety, which are now being shipped. Apples are nearly a total failure.

*Week ending September 10th, 1894.*

All agricultural conditions have been improved by the copious rains of the week. Wheat seeding will now occupy the attention of the farmer. Corn cutting has begun in some localities; there will be a better yield than was expected. A large crop of fodder is being saved. An excellent product of buckwheat is being harvested in western Maryland. Tobacco is ripening unevenly, owing to drought, but for curing, the weather could be no better. The canning season is at its height, and farmers are busy hauling tomatoes and sweet corn. There will be a fair crop of late potatoes. Sprayed grapes are plentiful and of good quality. Wild grapes are also abundant. Apples are inferior and peaches a total failure.

*Week ending September 17th, 1894.*

The largest crop of wheat ever grown in western Maryland is reported to have been harvested this year. Barley and rye are being sown. The corn crop is fairly good in most places. Buckwheat harvesting has begun and the yield is heavy. Potatoes are reported up to the average. Tobacco is being rapidly saved, the weather continuing excellent for ripening and curing. Clover seed is being hulled. Pastures are poor, but will be benefited by the recent rains. Chestnuts are a failure in Garrett county on account of the recent drought. Fall plowing is progressing satisfactorily.

*Week ending September 24th, 1894.*

In many places the corn harvest has begun; most of the early planted is cut and in shock, but the late crop will not come in before the close of the month. Buckwheat threshing has been much delayed by cloudy and wet weather, and the crop is injured to some extent by sprouting. Crimson clover seeded in August is poor. Millet is ripening low. A large yield of sweet potatoes is being marketed. Late cabbage is below the average. Notwithstanding their injury by

drought, turnips will yield fairly well. The tomato crop is larger than was anticipated, and as the canneries are unable to use all that are available, many will go to waste. Of apples, the Baldwin variety is the most common.

*Monthly Meteorological Summary of Observations taken at Baltimore, Md., and Washington, D. C., during the month of September, 1894.*

BALTIMORE, MD.

*Summary.*

Mean barometer, 30.10. Highest barometer, 30.53; date, 15th. Lowest barometer, 29.70; date, 19th. Mean temperature, 71. Highest temperature, 94; date, 10th. Lowest temperature, 45; date, 26th. Greatest daily range of temperature, 27; date, 23rd. Least daily range of temperature, 4; date, 19th.

*Mean temperature for this month in*

1871...63	1877...68	1883...65	1889...65
1872...69	1878...69	1884...72	1890...65
1873...67	1879...65	1885...67	1891...71
1874...70	1880...68	1886...70	1892...66
1875...66	1881...77	1887...65	1893...67
1876...65	1882...69	1888...64	1894...71

Mean temperature for this month for 24 years, 68; accumulated excess of daily mean temperature during the month, 74; average daily excess, 2.5; accumulated excess of daily mean temperature since January 1st, 268. Prevailing direction of wind, northeast. Total movement of wind, 4731 miles. Maximum velocity of wind, direction and date, 36, N. W., 10th. Total precipitation, 4.75 inches. Number of days on which .01 inch or more of precipitation fell, 10.

*Total precipitation (in inches) for this month in*

1871...2.22	1877...5.27	1883...3.49	1889...4.59
1872...5.06	1878... .82	1884... .09	1890...4.76
1873...3.70	1879...2.72	1885...1.30	1891...5.46
1874...4.83	1880...7.78	1886...1.90	1892...2.36
1875...3.62	1881...2.98	1887...2.80	1893...1.80
1876...10.52	1882...9.38	1888...4.90	1894...4.75

Average precipitation for this month for 24 years, 3.80. Total excess in precipitation during month, .91. Total deficiency in precipitation since January 1st, 6.58. Number of clear days, 11; partly cloudy days, 4; cloudy days, 12.

WASHINGTON, D. C.

*Summary.*

Mean barometer, 30.11. Highest barometer, 30.53; date, 13th. Lowest barometer, 29.74; date, 19th. Mean temperature, 71.4. Highest temperature, 95; date, 10th. Lowest temperature, 47; date, 26th. Greatest daily range of temperature, 30; date, 23rd. Least daily range of temperature, 6; date, 18th.



*Mean temperature for this month in*

1871...62	1877...67	1883...65	1889...66
1872...69	1878...69	1884...72	1890...68
1873...68	1879...64	1885...66	1891...70
1874...70	1880...68	1886...69	1892...65
1875...65	1881...77	1887...65	1893...64
1876...65	1882...69	1888...65	1894...71

Mean temperature for this month for 23 years, 67. Accumulated excess of daily mean temperature during the month, 120; average daily excess, 4. Accumulated excess of daily mean temperature since January 1st, 644. Average daily excess, 2.4. Prevailing direction of wind, N. E. Total movement of wind, 4044 miles. Maximum velocity of wind, direction and date, 27, N. W., 10th. Total precipitation, 1.53 inches.

Number of days on which .01 inch or more of precipitation fell, 9.

*Total precipitation (in inches) for this month in*

1871...2.70	1877...4.93	1883...4.33	1889...3.88
1872...3.92	1878...2.46	1884...0.14	1890...4.22
1873...3.48	1879...1.56	1885...2.15	1891...3.12
1874...7.84	1880...3.42	1886...1.79	1892...3.55
1875...1.98	1881...2.19	1887...3.12	1893...3.91
1876...10.81	1882...7.84	1888...6.82	1894...1.53

Average precipitation for this month for 23 years, 3.98. Total deficiency in precipitation during month, 2.45. Total deficiency in precipitation since January 1st, 13.25. Number of clear days, 14; partly cloudy days, 7; cloudy days, 9.

## DAILY PRECIPITATION FOR SEPTEMBER, 1894.

STATIONS.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Tot	
Sunnyside						T	T	.55	.01	.42		T	T			.04		.60	.81	.22							T	.02	.13	.20	3.00		
Oakland						T	†	.32	.05	.33		T				.02		.53	1.09	.35			T				T	.10	T		2.80		
Grantsville								.30		.25		.10				.35	.47		1.05	.10												2.87	
Boettcherv.								.20		.20				T	T	.20	T	1.50	.30													2.40	
Cumb. (a)								.31		.12						.21		.60	.20	.53												1.97	
Cumb. (b)					.04	.27								.10	.04	.05		.73	.51													1.74	
Mt. St. M'y.,**														.02	.01	1.50	.12	1.44	1.14	.08							T					4.31	
Frederick					.12	.24			.41	.30						†	.24	.62	.78	.19									†		.12	3.02	
Taneytown				2.45	.40	.46				T						1.72	.40	.90	1.25	.12												7.70	
Bach. V'y					1.18	2.10	.24	.40	.09							.48	.52	1.16	1.70								T		T			7.87	
Fenby					.10	.40	.20	.80	.10							.50			1.90													4.00	
Woodst. Col						T	T	.40	T							T	T	T	.90									.15	T			1.45	
Baltimore						T	.58	1.10	.06	.11	T					T	.88	.07	1.90	.01								.03	.01	T	T	4.75	
Fallston						.53	T	.23	.30		T					.18		.03	2.33									.07	.01			3.68	
Darlington						†	1.68	.35	1.31		T					.41		.03	3.26									.07	T	T	T	7.04	
Great Falls								.76									.93	.02	.83	.02									.05	.07		2.68	
Annapolis							.67		.10	.10							.45	.11	.10													1.53	
Dist. R. D.C								.35									.12		.95	.15							.08	.07				1.72	
Rec. R. D.C								.03											1.00									.06				1.09	
Wash., D.C.						T	.05			T	.02				T	T	.11	.06	1.05	.07								.12	.01	.04		1.53	
Col. Park							.08	T	T							T	.31	.05	1.05									.15	.01	T		1.65	
Up. Marl.								T	T							.10	.02	.04	.88	.05								.02	T	.06		1.16	
Marshall H.																																	
Benedict																	.04	1.01	T										.28	.09		1.42	
La Plata																.01		.75	.10											.30	.10	.96	
Bel Alton						.30		.67	.20									.70															1.47
Pope's Cr'k																.30		.25	.08	1.04								.03	.30	.20	.01	1.20	
Solomon's					T			.03		.07								.55		1.00	.02							.07	.09	.19	.06	1.94	
Charl. Hall								.05										.67	1.26	1.40												2.04	
Cherryfields								.10	.08	T																			.10	.06	T	T	3.69
Chestert'n.						.95										.94		.36	.97	.63												2.65	
Denton																																	3.99
Boston					1.47			.06											†	1.86										†	†	.60	2.66
Mardela Sp.					.03				.08																				.18	†	†		2.66
Fri'cess An.						.12										.03	.63	1.25										.10	.53			2.66	
Poc'm'k Cit								.31									T	T	.72	.04								.36	.30	.10	.08	1.91	
Wilm't. Del.					.25	.39	T	1.72	.20								†	2.15										.02	.05	T	T	4.78	
Newark, Del.					†	.30	3.40	.51								.07		1.02	3.59													8.89	
Dover, Del.						.46	†	.61								†	1.54	†	1.84										†	†	.16		2.58
Milford, Del.																																	4.61
Seaford, Del.																	.06	†	1.39									.28	†		.85	2.68	
Millsb'o, Del						.88	.02		T								.01		2.96									.24	.36	†	.10	4.32	
Ca. Chs., Va.																			.25										†	†		6.22	
Norfolk, Va.	.82		T		.08	.06												T	1.21														6.49
Warsaw, Va					.08												.49			1.45								.75	1.40	1.12	.83	2.97	
Phila. Pa.					.01	T	.01	.82	1.14	.75	T				T		T	.55	1.13	.70								T	†	†		5.11	

NOTE.—"T" indicates a trace of rain or melted snow. † Dates on which rain fell, but not measured until next observation.

\*\* For last 17 days, only.

STATIONS.	COUNTIES.	Altitude above sea in ft.	Latitude.	Longitude.	TEMPERATURE.										Monthly Range.	Total Precipitation.	Clear Days.	Fair Days.	Cloudy Days.	Rainy Days. (0.1 in. or more)	Prevailing Wind.															
					Monthly Mean.	Mean of Max.	Mean of Min.	Degrees	Max.		Min.		Monthly Range.																							
									Date.		Date.																									
<b>WESTERN MARYLAND.</b>																																				
Sunnyside.....	Garrett.....	.....	39°20'	79°21'	62.2	73.4	50.9	88	3	29	23	59	3.00	15	4	6	9	S. W.																		
Oakland.....	Garrett.....	2380	39 21	79 18	61.2	71.3	51.1	82	9	32	26	50	2.80	15	10	5	9	S. W.																		
Grantsville.....	Garrett.....	.....	39 41	79 12	64.6	74.4	54.8	86	9	31	26	55	2.87	5	14	11	8																			
Boettcherville!*	Allegheny.....	.....	39 39	78 48	67.9	.....	.....	94	9	38	26	56	2.40	.....	.....	.....	.....																			
Cumberland (a).....	Allegheny.....	650	39 39	78 46	71.2	79.6	62.7	92	9	42	26	50	1.97	.....	.....	.....	.....																			
Cumberland (b)....	Allegheny.....	700	39 39	78 45	68.8	77.4	60.2	94	9	38	26	56	1.74	17	7	6	7																			
<b>NORTHERN-CENTRAL MD.</b>																																				
†Mt. St. Mary's Col**	Frederick.....	720	39 43	77 20	m63.3	.....	.....	87	15	44	26	43	4.31	.....	.....	.....	.....	N. W.																		
Frederick.....	Frederick.....	280	39 24	77 18	70.4	79.5	61.2	93	10	43	26	50	3.02	.....	.....	.....	.....																			
Taneytown.....	Carroll.....	.....	39 40	77 9	.....	.....	.....	.....	.....	.....	.....	.....	7.70	.....	.....	.....	.....																			
Bachman's Vall!*	Carroll.....	.....	39 37	76 55	66.8	.....	.....	90	9, 16	40	26	50	7.87	16	8	6	9	S. E.																		
Fenby!*	Carroll.....	950	39 33	76 58	68.8	.....	.....	86	9, 10	44	26	42	4.00	15	9	6	7	S. E.																		
McDonogh.....	Baltimore.....	535	39 23	76 44	L 67.2	L 74.1	L 64.4	88	9, 10	44	26	44	.....	.....	.....	.....	.....																			
Woodstock Col.....	Baltimore.....	400	39 19	76 51	68.6	77.2	59.9	91	10	40	26	51	1.45	10	9	11	10	E.																		
Baltimore.....	Baltimore.....	179	39 17	76 36	70.6	78.1	63.2	94	10	45	26	49	4.75	11	7	12	10	N. E.																		
Fallston!*	Harford.....	450	39 31	76 24	68.2	.....	.....	89	9	43	26	46	3.68	.....	.....	.....	.....	S. W.																		
Darlington.....	Harford.....	300	39 39	78 45	b 68.2	b 76.0	b 60.3	89	10	41	26	48	7.04	.....	.....	.....	.....																			
Great Falls.....	Montgomery.....	.....	39 0	77 14	70.8	.....	.....	90	9, 10	46	26	44	2.68	.....	.....	.....	.....																			
<b>SOUTHERN MARYLAND.</b>																																				
Annapolis.....	Anne Arund'l	20	38 58	76 30	70																															

\* Extremes of temperature from observed readings of dry thermometer. A numeral following the name of a station indicates the hours of observation from which the mean temperature was obtained, thus:  
<sup>1</sup> Mean of 7 a. m. + 2 p. m. + 9 p. m. + 9 p. m. + 4.    <sup>2</sup> Mean of 8 a. m. + 8 p. m. + 2.    <sup>3</sup> Mean of 7 a. m. + 2 p. m. + 2.  
The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers. Letters of the alphabet are used to denote the number of days that are missing from record; for instance, "a" denotes 1 day missing. An italic letter following the name of a station indicates that two or more observers, as the case may be, are reporting from the same station. ‡ Omitted in computing averages. \*\* For last 17 days, only.