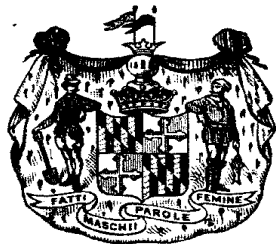


U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU,
CO-OPERATING WITH THE

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.

WM. B. CLARK,
JOHNS HOPKINS UNIVERSITY,
Director.

MILTON WHITNEY,
MARYLAND AGRICULTURAL COLLEGE,
Secretary and Treasurer.

C. P. CRONK,
U. S. WEATHER BUREAU,
Meteorologist in Charge.

VOL. II.

MONTHLY REPORT OF OBSERVATIONS, APRIL, 1892.

No. 1.

Organization of the Maryland State Weather Service.

The Maryland State Weather Service was organized May 1, 1891, under the joint auspices of the Johns Hopkins University, the Maryland Agricultural College, and the United States Weather Bureau.

The few scattered observers in Maryland and Delaware who had hitherto reported to the Chief of the United States Weather Bureau were authorized on that date to send their reports to the central office at the Johns Hopkins University. At the same time it was considered advisable to move the Baltimore office of the United States Weather Bureau to the University, as the future efficiency of the State Service was recognized to depend largely upon the closeness of co-operation with the National Service. Quarters were accordingly assigned in the Physical Laboratory, and the roof of that building has since been used for the exposure of instruments.

Two series of reports were at once established: First, a monthly Meteorological Report, which began with May and was continued until November, and second, a weekly Crop Bulletin, the first issue of which appeared on June 26, and was continued on every succeeding Saturday until September 25. These reports were sent widely throughout the State and elicited much favorable comment from the people and the press.

It was evident from the start that the results of the local service could not be made available to the people of the State unless they provided means for the publication and distribution of the information obtained. The institutions interested in the organization of the State Service were willing to prepare the data for publication, but they had no fund at their disposal for printing. To that end a bill was introduced in the last Legislature, was passed by both houses and was signed by the Governor. It provides for the establishment of the Maryland State Weather Service, the commissioning of its officers by the Governor, and an appropriation to defray the expenses of printing.

Since the passage of the bill, Weather Crop Bulletins have been issued weekly, and beginning with this report, Monthly Meteorological Reports will hereafter be published. The number of stations has been increased from month to month since the organization of the State Service, so that the reports published will increase constantly in value. It is the intention to continue to add to their number until every locality shall have its reporting station. The observers are of three classes: 1st, those who report meteorological facts only; 2d, those who send crop notices; 3d, those who display signals. In some instances the same man officiates in all three capacities.

The work of the service in these respects is similar to that of other like organizations, and the same benefits are anticipated. The natural and other advantages, however, which the State of Maryland offers to render the local bureau of practical benefit to its inhabitants are unexcelled, and correspondingly good results should be obtained. The largest and most important arm of the Atlantic in the United States bisects the territory embraced, and important commercial interests can therefore be benefited by the establishment of signal stations at such points on the Bay and its tributaries as can readily be communicated with, for the purpose of giving to captains of vessels information as to the forecasts for

wind, weather and temperature. Several such stations have already been equipped. The climate varies from marine to continental, as the result of the influence of the Chesapeake Bay and the ocean upon the eastern section, and the presence of the Appalachian mountain system in Western Maryland, and consequently presents interesting features for study, the results of which should be of value. Owing to this difference in climate, together with the variety of soil-formations and the length of coast-line, the agricultural and commercial interests of the State are many, and the range of usefulness of a local weather bureau correspondingly wide. An important departure will be the determination and comparison of the several geological and soil formations as regards their variations in temperature and moisture under varying climatic conditions, the kinds of crops adaptable to the different formations, and the possible changes that can be made by the use of fertilizers and manures. Investigations in this department are in progress under the direction of Professor Milton Whitney, at the laboratory at Clifton.

A BILL

Entitled an Act to establish a State Weather Service, and to make an appropriation therefor.

SECTION 1. Be it enacted by the General Assembly of Maryland, That there is hereby established a State Weather Service, which shall be under the control and management of the Johns Hopkins University, the Maryland Agricultural College and the United States Weather Bureau; the officers of said service shall be a Director, designated by the President of the Johns Hopkins University, a Secretary and Treasurer, designated by the President of the Maryland Agricultural College, and a Meteorologist in Charge, designated by the Chief of the United States Weather Bureau; they shall be commissioned by the Governor, and be duly qualified as officers of the State; the said officers shall constitute a Board of Government, under the direction of the institutions from which they are appointed, and shall receive no compensation for their services as such officers.

SEC. 2. The central station and office of said service shall be at the Johns Hopkins University; the Board of Government shall establish, if practicable, one or more voluntary meteorological stations in each county in the State, and supervise the same, co-operating with the Chief of the United States Weather Bureau for the suitable location of such stations, in order that the greatest usefulness may result to the State and National services; the said officers are authorized to print weekly and monthly reports of the results and operations of said services, and to distribute the same in such a manner as they shall deem most serviceable to the people of the State.

SEC. 3. The sum of two thousand dollars* annually, or so much thereof as shall be necessary, is hereby appropriated out of any funds of the Treasury not otherwise appropriated, for the purpose of carrying out the provisions of this Act, to be paid to said officers, or to their order, by the Treasurer, upon the warrant of the Comptroller, and upon the vouchers of said officers; provided, however, that no part of said sum shall be paid for salaries for any officer or officers, but a reasonable compensation may be paid for printing and other necessary and proper expenses of said officers.

SEC. 4. The said officers shall report to the Legislature at its regular sessions their expenditures under the provisions of this Act, and such other information as said officers may deem desirable, or as the Legislature may require.

SEC. 5. And be it further enacted, That this Act shall take effect from the date of its passage.

Approved April, 1892.

*The Governor signed the bill on the condition that only \$1000 of this appropriation should be used annually.

Some Comparisons, Climatic and Otherwise.

The first Lord Baltimore was a wise as well as a learned man, and he proved his wisdom when he allowed himself to view with favor the land of the Chesapeake, beautiful to look upon, possessed of a temperate climate without the rigor of severe northern winters or the enervating influence of torrid southern summers, the mid-land of the English-Atlantic coast, fertile, and indented by a wonderful bay with many navigable arms,—a bay, which, from that day to this, has been famous for its bountiful yields of shell-fish and the choicest of the finny tribe. It seems not strange that the settlements made near its borders thrived and never received serious check. But it was climate above other considerations which induced Lord George Calvert to exchange the cold, barren Newfoundland shores for the mild and fertile region of the Chesapeake; and he could scarcely have chosen a locality better calculated to promote the comfort as well as the prosperity of his adherents. "The colonists," says a prominent historian, "had every reason to be satisfied with their new abode. They had emigrated to one of the most beautiful countries in the world. The climate of southern Maryland is, perhaps, the most delightful on the American continent. It is a happy medium between the extreme heat of the South and the extreme cold of the North. The winters are mild, but the atmosphere is sufficiently bracing to nerve the system for the exhaustion of the warmer part of the year. The spring is calm, sunny, genial and temperate; the summer is magnificent in the luxuriance of its vegetation. The autumn is peculiarly delightful in temperature, and the changing foliage then presents a splendor and variety of color probably unmatched in the world. Maryland lies at the overlapping of two great botanical regions, and has therefore a remarkably varied and intermingled vegetation; and at this season every copse presents a blending of harmonious hues. The hickory, sassafras and poplar assume a vivid yellow; the maples and black gum, pink and scarlet; the dogwood and sweet gum, rich crimson and purple; the oaks, all shades of red, orange, purple, gray or brown; while the pines, spruces, thuyas and junipers wear their perennial robes of darker or gayer green, over which the Virginia creeper often hangs its festoons of vermilion. These hues change from day to day; first brightening, then deepening in tone, until the rains and winds of November strip them from the boughs. After the leaves have fallen, there succeeds what is called the 'Indian Summer,' a season in which there is a peculiar balmy softness in the air and mellowness in the sunlight. The more northern tribes had a poetic fancy that this season was produced by winds from the southwest which blew from the regions of the Blessed."

The above is a glowing but, nevertheless, a truthful picture of the climate and natural vegetation of Maryland.

The thermometer did not come into general use until about the beginning of the present century, so that the colonist's sense of heat was his thermometer and, as a matter of course, no weather data were recorded. Probably the first series of regular meteorological observations taken in the State were those of Mr. Lewis Brantz, from 1817 to 1822, inclusive. The observations were made at Baltimore, and for that early day in Meteorology are remarkably complete and bear upon them the mark of accuracy.

It is supposed by many that our climate is changing from year to year—that it was quite different sixty, forty, or even twenty years ago; but, comparing the observations of Mr. Brantz with those taken at Baltimore by the Weather Bureau during the past twenty years, the change in sixty years is not apparent. The mean temperature of the six years 1817 to 1822 was, according to Mr. Brantz's observations, 60.5; that of the past twenty-one years, 64.2. The fact that the observations of Mr. Brantz were not taken in the city, but "near Baltimore," may account in some degree for the slight difference. The instruments of Mr. Brantz, though the best obtainable at that time, very likely would probably not compare exactly with the modern standards; besides, the taking of the first observation of the day at sunrise and the last at 10 P. M. would probably give too low a mean; and again, we may select from the past twenty-one years, six years which give a mean of 63.2. The average rainfall for May 1817 was 4.60 inches, while for the past twenty-one years it averages 3.55 inches in that month.

Up to the year 1818 meteorological observations in the United States were limited to those taken by scattered observers working with no connected plan. Of these observers Mr. Brantz must have been one of the best, as he was a man of scientific attainments and used the most perfect instruments obtainable in those days. During the year 1818 the Medical Department of the Army was created and a connected system of meteorological observations was proposed by the Surgeon-General, Dr. Joseph Lovell. The system was adopted, and went into effect at the beginning of the year 1819. But these

first observations of the Medical Department were not so complete as those of Mr. Brantz, the instruments being limited to a thermometer and wind-vane, until 1836 when a rain-gauge was added to the meteorological outfit of each military post. The hours of observation first selected by the Medical Department were 7 A. M., 2 P. M., and 9 P. M., but in 1841, "7 A. M." was replaced by "sunrise," thus bringing the hours of observation close to those of Mr. Brantz, which were taken at "sunrise," 2 P. M., and 10 P. M. A more extensive system of observations, embracing four observations daily, and including two observations, daily, of the wet-bulb thermometer and the depth of the rain and snow, was begun by the Medical Department in 1843. This system, with modifications, has extended to the present time. Systematic work of this kind was also begun by the Smithsonian Institute in 1849.

In 1871 began the greatest system of meteorological observations ever undertaken in any country, that of the United States Weather Bureau. It has gradually extended, absorbing the other systems, and now has in the United States, alone, nearly three thousand reporting stations, including those of the State Weather Services.

The last table published, which includes a monthly summary of the reports of the Maryland State Weather Service, was that for November 1891. The following table includes the succeeding months, from December to March, inclusive, the results of the observations for these months being placed in comparison:

From the table it may be seen that December was the warmest month of the four, with a mean for the State of 42.4° , and January was the coldest, with a mean of 31.5° . February and March give respectively 35.2° and 36.7° . The coldest place of observation was Mt. St. Mary's College, Frederick county, with a mean for the four months of 34.2° , and the warmest, the residence of Mr. Howard Shriver, of Cumberland, Alleghany county, with a mean of 39.2° . It is worthy of remark that the observations of Mr. E. T. Shriver, Cumberland, give a mean of 35.0° . The place giving a mean temperature next below the mean of Mr. Howard Shriver's observations, was Easton, Talbot county, 38.5° . The lowest minimum temperature, -8° , was observed in February, at Boettcherville, Alleghany county. The station with the highest minimum for the four months, 22° , was Kirkwood, Delaware. Leonardtown, St. Mary's county, had a minimum of 21° . The highest maximum temperature, 70° , for the four months, was recorded in January at two stations, Barron Creek Springs, Wicomico county, and Kirkwood, Delaware. The station with the lowest maximum, 49° (in January), was New Market.

The station with the greatest monthly range of temperature, 68° (in February), was Boettcherville, and the one with the least range, 31° (in March), was Denton, Caroline county. The greatest monthly rainfall, 8.35 inches, was in March at Jewell, Anne Arundel county. Baltimore followed with 7.20 inches for the same month. The least monthly rainfall, 1.56 inches, fell in February at Great Falls, Montgomery county. There were 14 rainy days in February at Baltimore, and but 4 at Hagerstown, Washington county, in the same month.

By reference to the Annual Summary for 1891, supplement to the Monthly Weather Review for December, 1891, it is noted that the mean temperature of Baltimore, for that year, 55.5, is 0.2 above the normal, the normal being the mean of twenty-one years. Baltimore's normal temperature is, therefore, 55.3° . The following table exhibits the normal temperatures of several places, and also their maximum and minimum temperatures for the year 1891:

STATIONS.	Baltimore.	New York City.	Boston.	Philadelphia.	Norfolk.	Jacksonville.	New Orleans.	Yuma.	Los Angeles.	San Francisco.	Red Bluff.	Kansas City.	St. Louis.	Chicago.	Des Moines.	St. Paul.	St. Vincent.	Omaha.	Bismarck.	Huron.
Normal.....	55.3	51.4	48.3	53.3	59.1	69	69	72.3	61.4	56	63	54.8	55.6	48.5	48.3	42.6	33.9	49.5	39.6	41.6
Max. 1891.....	94	94	96	97	97	100	94	116	109	100	114	95	96	96	93	95	92	97	94	97
Min. 1891.....	16	9	2	12	22	30	30	25	33	37	26	-4	4	-8	-8	-25	-34	-9	-33	-24

From the above table it may be observed that the yearly extremes of temperature increase as we leave the coast, that the maximum and minimum temperatures are a great way apart in the interior. On and near the Pacific coast the noticeable feature is the maximum temperature, which frequently reaches 110° and even higher. In Minnesota, Kansas, Missouri, the Dakotas, and others of the Western States, the summer heat is equal to or above that in Maryland, yet the winters are much colder and longer.

"Rain is the poor man's manure," and when it comes well distributed in moderate showers it is indeed the best of fertilizers. The recent investigations of Prof. Whitney seem to insure that the time is not far distant when the rain may be made to render in much greater measure its assistance to plant growth. As you leave the sea, the rainfall diminishes and drouth is of frequent occurrence. Owing to the scarcity of trees, the rain is likely to come in floods, as in the present season. These dangerous rains are uncommon near the coasts. The plains of the West, lying as they do in the tracks of the great cyclonic storms, are a fair field for terrible tornadoes which rival in destructiveness the earthquakes of the Torrid Zone.

A comparatively small amount of snow falls in Maryland, the total for the winter being often less (except in the mountains) than falls during one storm at a northern or western station. The winter of 1889-90 gave at Baltimore but 4.9 inches=about 0.5 inch of rain; the winter of 1890-91 gave 35.9 inches=about 4 inches of rain, and the last winter gave 43.3 inches=about 4.3 inches of rain.

Of course the pleasures of sleighing are for the most part wanting, but there are offsets in the way of coal bills, etc., which, in part at least, make up for the enjoyment lost.

On the score of health, Maryland has an excellent standing among the States. Statistics show that there is in the whole country but one healthier city than Baltimore.

It seems beyond the understanding that intelligent people with small or large amounts of money to invest in lands should slight such advantages as Maryland offers to them, for the region beyond the Alleghanies.

Intelligent and progressive farmers coming to Maryland find excellent land at low prices, a delightful climate, unexcelled water transportation, rapidly developing railroad resources, and in Baltimore and Washington two of the best markets in the country. These great cities are well seconded by Cumberland, Hagerstown, Frederick, Annapolis, Cambridge, and a host of other prosperous places. The prospects for truck farming in southern, eastern and central Maryland are unexcelled, and without doubt the land which now can be purchased at from \$5.00 to \$30.00 per acre will rapidly advance to double that value. One has but to glance at the geographical position of the State and the situation of the cities of Baltimore and Washington to appreciate this fact. There could be no better outlook for dairy farming, both owing to the great markets and to the superior grazing lands. The northern and western portions of the State have an excellent, strong soil and are admirably adapted to general farming. There is plenty of timber land, and as for fruits, Marylanders can justly take pride in their peaches, pears, and small fruits.

There is great pleasure in living in the neighborhood of large bodies of water—near enough at least so that they can occasionally be visited, particularly during the summer months. The Maryland farmer can, at small expense, take his family to the beach where one of the most pleasant of vacations may be enjoyed. In many cases, indeed, he can look from his house out upon the broad expanse of ocean, bay, or one of the great navigable rivers for which the State is famed. The Severn River is called the "Hudson of the South," and any one who has visited its beautiful banks will testify that it is well named. Besides the large number of bays which open into the Chesapeake or into the Atlantic Ocean, there are more than thirty navigable rivers in Maryland. No other State is possessed of such excellent facilities for transportation by water.

While we touch upon the subject of pleasure we may mention the facility with which the resident of Maryland may exchange the climate and scenery of the coast for the entirely different phases which pertain to a beautiful mountain district. Such pleasures are not for the inhabitants of the western plains, who may go only from flatness to flatness.

Maryland, too, abounds in places of historical interest, and the intelligent man or woman finds much of interest in viewing the places hallowed by their association with Washington and his compatriots.

It seems unaccountable that good land can be bought in Maryland so low as from \$5.00 to \$30.00 per acre. One reason for this, no doubt, is the opening of the great West to settlers and the consequent flocking of the people in that direction, as always happens in the case of a new country. But the tide is bound to turn and flow again into the desirable Eastern States, and, by the signs which may be read by all, this time is close at hand.

Perchance Maryland has been slighted because people are not aware of her resources. We learn by comparison the degree of excellence of a thing. We ask the people of Maryland, as well as those beyond her borders, to institute this comparison between her and her sister States. We do not claim for her all the natural and other advantages possessed by every other commonwealth, but we believe that few of them offer more to the intelligent, energetic farmer than does the State of Maryland.

C. P. CRONK.

Meteorological Stations reporting to the Maryland State Weather Service.

Stations of Observation.	County.	Observer.
Agricultural College	Prince George's	W. H. Zimmerman, A. M.
Annapolis.....	Anne Arundel.....	Walter Hay, M. D.
Baltimore.....		{ G. N. Wilson,
		{ W. D. White,
		{ A. T. Brewer.
Barron Creek Springs	Wicomico	Albert E. Acworth.
Boettcherville	Alleghany	F. F. Brown.
Charlotte Hall	St. Mary's	R. W. Silvester.
Cumberland <i>a</i>	Alleghany	Howard Shriver.
Cumberland <i>b</i>	Alleghany	E. T. Shriver.
Darlington	Harford	A. F. Galbreath.
Denton	Caroline	F. C. Ramsdell.
Distributing Reservoir, D. C.		Lieut.-Col. Elliot.
Dover, Del.....	Kent.....	Jno. S. Jester.
Easton	Talbot	S. P. Minnick.
Edgemont	Washington.....	Chas. Feldman.
Fallston	Harford	G. G. Curtiss.
Frederick	Frederick.....	G. Ernest Bantz.
Great Falls	Montgomery	Lieut.-Col. Elliot.
Jewell	Anne Arundel.....	Jos. Plummer.
Kirkwood, Del.....	New Castle	W. C. L. Carnagy.
Leonardtown	St. Mary's	G. W. Joy.
McDonogh	Baltimore.....	W. W. Walker.
Mt. St. Mary's (Emmitsburg)	Frederick.....	J. A. Mitchell, A. M.
New Market	Frederick.....	H. H. Hopkins, M. D.
Receiving Reservoir, D. C.		Lieut.-Col. Elliot.
Seaford, Del	Sussex	H. L. Wallace.
Solomon's	Calvert	W. H. Marsh, M. D.
Taneytown	Carroll	C. W. Weaver, M. D.
Upper Marlborough.....	Prince George's	F. Sasscer.
Woodstock College	Howard	T. J. A. Freeman, S. J.
Norfolk, Va		A. J. Davis.
Washington, D. C.....		S. W. Beall.

Stations displaying Weather Signals.	County.	Displaymen.
Annapolis	Anne Arundel.....	W. M. Abbott.
Bel Air	Harford	N. N. Nock.
Bradshaw	Baltimore.....	B. F. Taylor.
Bridgeville, Del.....	Sussex	T. J. Gray.
Buckeystown	Frederick.....	A. W. Nicodemus.
Darlington	Harford	A. F. Galbreath.
Delaware City, Del.....	New Castle	W. E. Reybold.
Dickerson	Montgomery	W. H. Dickerson.
Easton	Talbot	G. W. Minnick & Son.
Emmitsburg	Frederick.....	J. A. Mitchell, A. M.
* Felton, Del.....	Kent	J. H. Hubbard.
Frostburgh	Alleghany	C. J. Conner.
Grantsville	Garrett	A. L. Gnagey.
Greensboro	Caroline	Plummer & Plummer.
Hagerstown	Washington.....	R. J. Hamilton.
Havre de Grace	Harford	W. S. McCombs.
Lonaconing	Alleghany	J. J. Robinson.
Middletown	Frederick.....	G. C. Rhoderick, Jr.
Milford, Del.....	Kent	J. Y. Foulk.
Oakland	Garrett	J. M. Litzinger.
Odenton	Anne Arundel	C. W. Claggett.
Ridgely	Caroline	J. A. Sigler.
Salisbury	Wicomico	L. W. Gunby.
Seaford, Del.....	Sussex	H. L. Wallace.

*Whistle Signals only.

Stations displaying Weather Signals.	County.	Displaymen.
Snow Hill	Worcester	Purnell & Vincent.
*Sparrow's Point	Baltimore	Md. Steel Co.
St. Michael's	Talbot	E. M. Jefferson.
Taneytown	Carroll	C. W. Weaver, M. D.
Westminster	Carroll	W. S. Myer & Bro.
Wilmington, Del.	New Castle	Wm. Lawton.
Crop Reporting Stations.	County.	Correspondent.
Agricultural College	Prince George's	E. W. Doran.
Annapolis	Anne Arundel	W. B. Finkbine.
Annapolis	"	D. S. Sprogle.
Barron Creek Springs	Wicomico	A. E. Acworth.
Berlin	Worcester	Thos. G. Hanley.
Bristol	Anne Arundel	E. O. Welch.
Bradshaw	Baltimore	B. F. Taylor.
Bryantown	Charles	B. M. Edelen, Jr.
Cambridge	Dorchester	Chas. S. Jackson.
Carrollton	Carroll	J. L. Arbaugh.
Catonsville	Baltimore	A. L. Crosby.
Cornersville	Dorchester	J. M. Beckwith.
Coleman	Kent	C. W. Harris.
Cumberland	Alleghany	Howard Shriver.
Darlington	Harford	A. F. Galbreath.
Denton	Caroline	F. C. Ramsdell.
Dickerson	Montgomery	S. B. Scholl.
Drum Point	Calvert	Alex. De Barril.
Easton	Talbot	S. P. Minnick.
Edgewood	Harford	Mrs. S. S. Russell.
Elvaton	Anne Arundel	G. F. Sappington.
Fallston	Harford	G. G. Curtiss.
Frederick	Frederick	Douglass Hargett.
Greensboro	Caroline	A. B. Roe.
Grantsville	Garrett	J. S. Miller.
Hancock	Washington	W. F. Humbert.
Harris Lot	Charles	J. R. Perry.
Hyattsville	Prince George's	Geo. B. Pfeiffer.
Huyett	Washington	M. H. Huyett.
Jewell	Anne Arundel	A. C. Wilson.
Keedysville	Washington	J. A. Miller.
Kirkwood, Del.	New Castle	J. F. Nelson.
Linwood	Carroll	W. C. Rinehart.
Lock 53	Washington	W. V. Seavolt.
Leonardtown	St. Mary's	G. W. Joy.
Mechanicstown	Frederick	J. J. Henshaw.
Milford, Del.	Kent	J. Y. Foulk.
Middletown	Frederick	G. C. Rhoderick.
Mt. St. Mary's	"	J. A. Mitchell, A. M.
Mt. Lake Park	Garrett	C. J. Bunce.
New Market	Frederick	H. H. Hopkins, M. D.
Patuxent	Anne Arundel	R. T. Donaldson.
Pleasant Valley	Carroll	N. H. Kester.
Queenstown	Queen Anne's	C. C. Willson.
Rising Sun	Cecil	Geo. E. Fisher, Ph. B.
Roberts	Queen Anne's	James T. Scott.
Rutland	Anne Arundel	Benjamin Watkins.
Sunnyside	Garrett	John Knauer.
Salisbury	Wicomico	Col. Lemuel Malone.
Taneytown	Carroll	C. W. Weaver, M. D.
Trappe	Talbot	Percival Mulliken.
Thurston	Frederick	W. J. Sumwalt.
Westminster	Carroll	E. C. Bixler.
Woodsborough	Frederick	G. F. Smith.

*Whistle Signals only.

MONTHLY SUMMARY OF REPORTS, APRIL, 1892.

STATIONS.	COUNTIES.	Altitude above Sea in feet.	Latitude.	Longitude.	† BAROMETER.				TEMPERATURE.										Monthly Range.	Total Precipitation.	Clear Days.	Fair Days.	Cloudy Days.	Rainy Days, (.01 inch or more).	Prevailing Wind.
					Monthly Mean.	Maxi- mum.		Mini- mum.		Monthly mean.	Mean of Maximum.	Mean of Minimum.	Maxi- mum.	Mini- mum.	Degrees.	Date.	Degrees.	Date.							
						Height.	Date.	Height.	Date.																
Baltimore.....		179	39°17'	76°36'	30.098	30.506	27	29.670	8	51.6	58.9	44.2	83	4	32	10	51	3.15	11	8	11	12	N.W.		
Barron Ck. Springs.....	Wicomico.....	25	38°30'	75°39'						51.3	59.4	43.3	79	3	29	12	50	6.68	10	10	10	9	S. E.		
Boettcherville.....	Alleghany.....		39°39'	78°48'						48.8	58.1	39.4	86	4	23	12	63	3.50				13			
Charlotte Hall.....	St. Mary's.....		38°28'	76°48'						52.0	62.4	41.7	85	3	28	23	57	4.47				8			
Cumberland a.....	Alleghany.....	650	39°39'	78°46'	30.090	30.431	27	29.735	8	52.8	61.5	44.1	87	4	30	12	57	3.51	10	3	17	9	W.		
Cumberland b.....	Alleghany.....	700	39°39'	78°45'						49.3	56.7	41.9	82	4	26	12	56	3.21	8	12	10	8			
Darlington.....	Harford.....	300	39°39'	76°14'						49.4	58.8	40.1	80	4	28	11	52	2.05	18	3	9	8	N.W.		
Distributing Res.....	Dist. Col.....		38°52'	77° 0'						51.9			79	4	33	12	46	5.28				13			
Dover, Del.....	Kent.....		39° 9'	75°31'						51.9	61.0	42.8	81	3	30	12	51	4.06	16	6	8	9	N.W.		
Easton.....	Talbot.....	35	38°42'	76° 6'						54.0	64.0	44.1	82	3	30	12	52	4.51	16	4	10	11	N.W.		
Edgemont.....	Washington.....		39°45'	77°29'						49.5	58.9	40.1	86	3	24	10	62						N.W.		
Fallston.....	Harford.....	450	39°31'	76°24'						48.8			78	4	28	12	50	2.89							
Frederick.....	Frederick.....	280	39°24'	77°18'						50.4	59.5	41.3	80	4	30	12	50	2.36	14	5	11	7			
Great Falls.....	Montgom'y.....		39° 0'	77°14'						51.8			80	3	34	10	46	4.30				13			
Kirkwood, Del.....	New Castle.....		39°35'	75°40'						48.0			76	4	30	16	46								
Leonardtown.....	St. Mary's.....		38°18'	76°40'						51.8	58.6	44.9	81	3	30	10	51	5.08	18	1	11	8	N.W.		
McDonogh.....	Baltimore.....	535	39°23'	76°44'						49.4	57.0	41.9	74	28	30	11	44	2.03				10			
Mt. St. Mary's.....	Frederick.....	720	39°41'	77°21'	30.090	30.520	27	29.720	8	49.0	57.4	40.7	81	4	29	10	52	2.80	11	16	3	12	N.W.		
New Market.....	Frederick.....	500	39°23'	77°18'						50.0			82	4	31	12	49	3.05	9	7	14	8	S. W.		
Receiving Res.....	Dist. Col.....		38°52'	77° 0'						51.6			79	4	33	12	44	5.24				14			
Seaford, Del.....	Sussex.....		38°40'	75°35'						53.0	63.5	42.6	81	3	29	12	52	5.58				9			
Solomon's.....	Calvert.....	20	38°18'	76°27'						51.0	61.0	41.0	79	28	32	10	47	5.23	5	7	18	9	N.W.		
Taneytown.....	Carroll.....		39°40'	77° 9'														2.96				10			
Washington, D. C.....		112	38°52'	77° 0'	30.110	30.500	27	29.620	14	51.4	59.7	43.2	81	3	31	12	50	4.52	12	7	11	14	N.W.		
Woodstock.....	Howard.....	392	39°20'	76°49'	30.154	30.538	25	29.744	14	50.4	60.4	40.5	80	4	25	10	65	3.02	8	10	12	10	N.W.		
*Norfolk, Va.....		43	36°51'	76°17'	30.116	30.452	27	29.564	14	50.0	64.2	47.9	83	5	33	11	50	6.86	13	7	10	12	N. E.		
Averages.....					30.108					50.0	59.8	42.1					51.8	3.89	11.9	7.1	11.1	10.2			

° 13th-16th inclusive, missing.

* Omitted in computing means.

† Readings reduced to sea-level.

DAILY PRECIPITATION FOR APRIL, 1892.

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		Total.	
Baltimore.....	.02	T			.21		T	.06	.06					.34	.42		T	.50		.09	.62	.52	.06		T	T			.25			3.15	
Barron Crk. Spr...	T	T				T		.79	.01					1.20	.06			.38				.34								.89			6.68
Boettcherville.....					.40									.60	.20			.60		.10	.70	.70	.10							.10			3.50
Charlotte Hall.....	.25						1.10											.75	.10	.15	1.00	.75								.67			4.77
Cumberland a.....					.55					.05				.10	.86			.54			.70	.73								.04			3.51
Cumberland b.....					.49									.84	.02			.53		.43	.26	.60								.04			3.21
Darlington.....					.22			.05						.64				.23			.61		.04		.08					.16			2.05
Dist. Res. D. C.....	.35		.05			.05		.08							1.02	.16		.17	.65		.86	.10	1.10							.18	.51		5.28
Dover, Del.....							.08		.08						.85			.57				1.86								.62			4.06
Easton.....		T					.02	.20	.03					.93	.10			.76		.18		1.44	.25		T					.70			4.51
Fallston.....	.02	.01			.21			.03						.75					.37			1.20								.30			2.89
Frederick.....					.22										.50	T		.53			.47	.53			T					.11			2.36
Great Falls.....	.50					.23		.12	.04						.45	.10		.20	.70		.63	.20	.63							.10	.40		4.30
Leonardtown.....	T						.53								1.33			.61				1.84			T					.77			5.08
McDonogh.....	.01				.15									.40	.20			.54		.12	.03	.38	.02							.18			2.03
Mt. St. Mary's.....	.02	.01			.33				.01						.72		.05	.25		.42	.16	.79			.05								2.80
New Market.....	T	T			.40		T								.65			.56				1.12			T					.32			3.05
Rec. Res. D. C.....	.63		.02			.12		.10	.03						.94	.10		.14	.73		.37	.07	.95							.06	.56		5.34
Seaford, Del.....		T					.07	.45	.04						1.11			.70				2.54			T					.67			5.58
Solomon's.....		T					.31	.23	T					1.18	.05			.57		.30	.68	1.16			T					.75			5.23
Taneytown.....	.03				.40									.40	.37				.20	.02	.56	.41		.11						.36			2.96
Wash'g't'n, D. C...	.02	.04			.03	T	.07	.06	.02	T				.30	.17			.37		.17	.72	.37	.03		T			T		.65			4.52
Woodstock.....					.30		T	.02						.75	.05	T		.50			.65	.50			T					.25			3.02
Norfolk, Va.....							.05	1.81	T					.10	.28			.71	T	.49	.24	.38	1.53		.09	.03				.30			6.86

NOTE.—T indicates a trace of rain or snow.

Monthly Summary.—April, 1892.

Temperature (degrees).—Mean monthly, 50.0. Highest monthly mean, 54.0, at Easton. Lowest monthly mean, 48.0, at Kirkwood, Del. Highest temperature, 87, at Cumberland (Howard Shriver), on the 4th. Lowest temperature, 23, at Boettcherville on the 12th. Greatest local monthly range, 65, at Woodstock. Least local monthly range, 44, at McDonogh and the Receiving Reservoir, D. C. Mean monthly range, 51.8. Mean maximum, 59.8. Mean minimum, 42.1.

Precipitation (in inches).—Average, 3.89. Greatest amount, 6.68, at Barron Creek Springs. Least amount, 2.03, at McDonogh.

Wind.—Prevailing direction, northwest. Total movement in miles, Baltimore, 6433; Norfolk, Va., 7421; Washington, D. C., 5705.

Thunderstorms.—At Baltimore, on the 5th; at Barron Creek Springs, on the 1st, 8th, 14th, 21st, 22nd, 23rd; at Cumberland (Howard Shriver), on the 5th; at Darlington, on the 5th; at Leonardtown, on the 22nd; at Solomon's, on the 14th, 18th, 22nd; at Woodstock, on the 5th; at Norfolk, Va., on the 1st, 14th, 18th, 22nd, 23rd.

Hail.—At Barron Creek Springs, on the 20th; at Easton, on the 20th; at Woodstock, on the 9th.

Frost.—At Barron Creek Springs, on the 11th, 24th, 27th; at Cumberland (Howard Shriver), on the 26th; at Easton, on the 27th; at Woodstock, on the 12th, 19th, 20th, 27th.

Halos.—At Baltimore, on the 3rd, 6th, 28th; at Barron Creek Springs, on the 2nd, 4th, 19th, 28th, 30th; at Cumberland (Howard Shriver), on the 3rd, 4th; at Mt. St. Mary's, on the 4th, 5th, 6th, 7th; at Solomon's, on the 2nd; at Woodstock, on the 6th; at Norfolk, Va., on the 2nd, 5th, 6th, 11th.

Polar Bands.—At Cumberland (Howard Shriver), on the 6th, 24th, 27th.

Aurora.—At Cumberland (Howard Shriver), on the 23rd; at Darlington, on the 22nd, 26th; at Mt. St. Mary's, on the 26th; at Solomon's, on the 25th; at Woodstock, on the 27th, 28th, 29th.

Average number of cloudless days, 12; partly cloudy days, 7; cloudy days, 11; rainy days, (.01 of an inch or more), 10.

Local verification of weather and temperature signals for April, reported by Displaymen (see list of):

Weather	-	-	-	-	86 per cent.
Temperature	-	-	-	-	91 " "
Average	-	-	-	-	88 " "

Notes by Observers.

Baltimore.—3, lunar halo. 5, thunderstorm. 6, lunar halo. 9, sleet and snow; high wind. 15, snow. 16, wind-storm. 28, solar halos.

Barron Creek Springs.—1, distant thunder. 2, lunar halo. 6, peach-trees in blossom. 8, distant thunder. 9, cold wave. 10, ice. 11, heavy white frost. 14, thunderstorm. 19, solar halo. 21, distant thunder. 23, heavy rain. 24, frost; pears and maples in blossom. 27, white frost. 28, solar halo all day.

Cumberland a.—4, halos; lightning. 5, thunderstorm. 9, lilac leafing. 10, snow. 15, snow and rain. 17, apple and pear trees leafing. 21, thunderstorm. 23, aurora; a distant hazy, yellow light, 10°–25° above horizon, higher as one went east. From the yellow bank, a long streamer at 11 p. m. No perceptible motion. 27, polar bands.

Darlington.—5, thunderstorm in north at 8.30 a. m.; low rumbling. 22, aurora borealis, 9 p. m., merely a brilliant sky. 26, aurora brilliant with bands of light streaming to zenith.

Easton.—April presents no unusual features excepting a warm spell during the first decade, which rapidly developed budding. This was followed by a slight fall in temperature and the only ice of the month; no damage known. 15, light snow. 20, hail. 27, frost.

Solomon's.—2, lunar halo. 14, 18, distant thunder. 22, thunderstorm. 25, faint aurora.

Woodstock College.—1, foggy; japonica, Eng. willow, snowballs, and shrubs budding. 3, distant lightning. 5, thunderstorms; forked lightning in S. W. 6, lunar halo. 7, peach trees budding. 9, storm at 8.30 a. m., very dark, high wind, hail and snow. 12, hoar frost. 15, snow; peach trees in bloom. 19, 20, hoar frost. 24, cherry trees blooming. 27, northern light. 28, aurora at 10 p. m. with white streaks of light. 29, northern light.

Norfolk, Va.—Thunderstorms, 1, 14, 18, 22, 23. Lunar halos, 2, 5, 6, 11.

a—Howard Shriver.

MAP OF MARYLAND AND DELAWARE

SHOWING
THE PRECIPITATION
AND
LINES OF MEAN TEMPERATURES
FOR APRIL, 1892.

Scale of Shades:



SCALE OF MILES.

