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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.

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

PROF. MILTON WHITNEY,
MARYLAND AGRICULTURAL COLLEGE,
Secretary and Treasurer.

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

VOL. III, No. 10.

MONTHLY REPORT.

FEBRUARY, 1894.

Review of the Month—January.

Temperature (degrees).—Monthly mean (for entire territory covered), 36.9, being 4.1 above the normal; highest monthly mean, 40.8, at Solomon's; lowest monthly mean, 30.2, at Bachman's Valley; highest temperature, 67, at Cumberland (a), on the 22nd; lowest temperature, 3, at Sunnyside, on the 26th; greatest local monthly range, 53, at Sunnyside; least monthly range, 31, at Cambridge; monthly mean range, 42.5; mean maximum temperature, 46.3; mean minimum temperature, 29.4.

Precipitation (in inches).—Average, 2.18, being 1.61 below the normal; greatest amount, 3.70, at Oakland; least amount, 1.15, at Distributing Reservoir, D. C.

Wind.—Prevailing direction, northwest. Total movement in miles, Baltimore, 5413; Norfolk, Va., 5839; Washington, D. C., 4788.

Thunderstorms.—At Bachman's Valley, on the 15th; at Charlotte Hall, on the 29th; at Millsboro, Del., on the 12th.

Hail.—At Millsboro, Del., on the 7th; at New Market, on the 24th, 30th.

Sleet.—At Bachman's Valley, on the 11th; at Baltimore, on the 24th, 25th; at Charlotte Hall, on the 26th; at Millsboro, Del., on the 25th, 27th; at Mt. St. Mary's, on the 11th, 29th; at New Market, on the 29th; at Solomon's, on the 27th; at Sunnyside, on the 30th.

Fog, dense.—At Bachman's Valley, on the 11th; at Baltimore, on the 11th, 16th, 24th; at

Barron Creek Springs, on the 2nd, 6th, 7th, 21st, 23rd, 24th; at Mt. St. Mary's, on the 22nd.

Parhelia.—At Barron Creek Springs, on the 22nd; at Solomon's, on the 5th.

Halos.—Lunar, at Cumberland, on the 13th, 18th; at Fallston, on the 13th; at Sunnyside, on the 12th, 22nd; at Mt. St. Mary's, on the 22nd.

Meteors.—At Fallston, on the 14th, 27th; at Seaford, Del., on the 14th.

Polar Bands.—At Baltimore, on the 22nd; at Cumberland, on the 3rd, 18th, 26th, 31st.

Rainbow.—At Cumberland, on the 28th.

Auroras.—At Benedict, on the 3rd; at Charlotte Hall, on the 3rd; at Fallston, on the 2nd, 3rd; at New Market, on the 3rd; at Solomon's, on the 3rd; at Woodstock College, on the 3rd, 24th.

Miscellaneous Notes.

Upon the request of Mr. W. F. Hanna, of the Baltimore and Lehigh Railroad, North Avenue Station, Baltimore, Maryland, the Chief of the Weather Bureau directed that the morning forecasts made at Washington, D. C., for Maryland and Eastern Pennsylvania, be telegraphed to Mr. Hanna, who telegraphs them to the following railroad stations without expense to the Government:

Bel Air, Md., Delta, Pa., The Rocks, Md., Baldwin, Md., Loch Raven, Md., Towson, Md., and Homeland, Md.

During the month display stations were established as follows: Hartly, Del., Miss Clara A. Foard; Smyrna, Del., Mr. A. Duncan Yocum; Frederica, Del., Miss Emma V. Newnom; Laurel, Del., Mr. E. D. C. Hegeman; Hampstead, Md., Mr. H. H. Meals; Pocomoke City, Md., Mr. R. M. Stevenson.

Crops.

Sunnyside, Garrett Co.—The weather during the past month was unusually warm, and was excellent for all farm work. All crops that suffered from constant freezing and thawing during December were somewhat injured during January, as there was not enough snow to afford protection.

JOHN G. KNAUER.

Solomon's, Calvert Co.—The snowfall during the month was light. The effect of this month's weather to growing crops has been rather detrimental.

W. H. MARSH, M. D.

Notes by Observers.

Bachman's Valley.—11th, high wind. 24th, cold wave from the northwest, high wind; 29th, the rain that had been falling all day turned to heavy snow at 7 p. m. Some of the flakes measured $1\frac{1}{2}$ inches in diameter.

J. M. MYERS.

Barron Creek Springs.—2nd, 12th, 13th, 18th, 19th, 20th, cold wave. 14th, brilliant flash of lightning, supposed to be a meteor. 12th, 25th, 30th, heavy winds. 24th, frogs heard. Average relative humidity for January, 77 per cent. Total snowfall, 5.5 inches.

A. E. ACWORTH.

Benedict.—30th, heavy galé which blew the schooner "Mary Etta" ashore. Her cargo consisted of 500 bushels of oysters.

THOMAS BERRY.

Charlotte Hall.—13th, dandelions in bloom. 31st, strawberries in bloom.

J. FRANCIS COAD.

Fallston.—Mean temperature of January for 23 years, not including this year, 30.2° ; warmest was that of 1890, with an average of 41° ; coldest was that of 1893, with an average of 22° . Average rainfall of January for 23 years, not including this year, 3.97 inches; wettest was that of 1882, with an average of 6.63 inches; driest was that of 1872, with an average of 1.20 inches. Total snowfall during January, 1894, 2.0 inches.

G. G. CURTISS, A. M.

Solomon's.—30th, heaviest northwest gale of the season.

W. H. MARSH, M. D.

Sunnyside.—4th, snow has all disappeared. 11th, snow and rain, high wind. 29th, 30th, the

most severe snowstorm that has visited this section for the last 16 years.

JOHN G. KNAUER.

Valley Lee.—18th, 19th, 20th, excessive low tides. 31st, strawberries still in bloom.

J. EDWIN COAD.

Woodstock College.—3rd, auroral phenomenon answering in its nature to the description given for the 6th class of auroral phenomena which is to be found in the "Instructions for Voluntary Observers." The phenomenon made its appearance at 7.30 p. m., lasting about half an hour. On the 24th there was observed another auroral phenomenon, which may be said to have belonged to the 8th class. It appeared at intervals from 7 to 7.45 p. m.

Monthly Summary of Meteorological Observations taken at Baltimore, Maryland, during the month of January, 1894.

Mean barometer, 30.19. Highest barometer, 30.65; date, 18th. Lowest barometer, 29.38; date, 29th.

Mean temperature, 38. Highest temperature, 57; date, 24th. Lowest temperature, 18; date, 26th. Greatest daily range of temperature, 22; date, 14th. Least daily range of temperature, 4; date, 17th.

MEAN TEMPERATURE FOR THIS MONTH IN

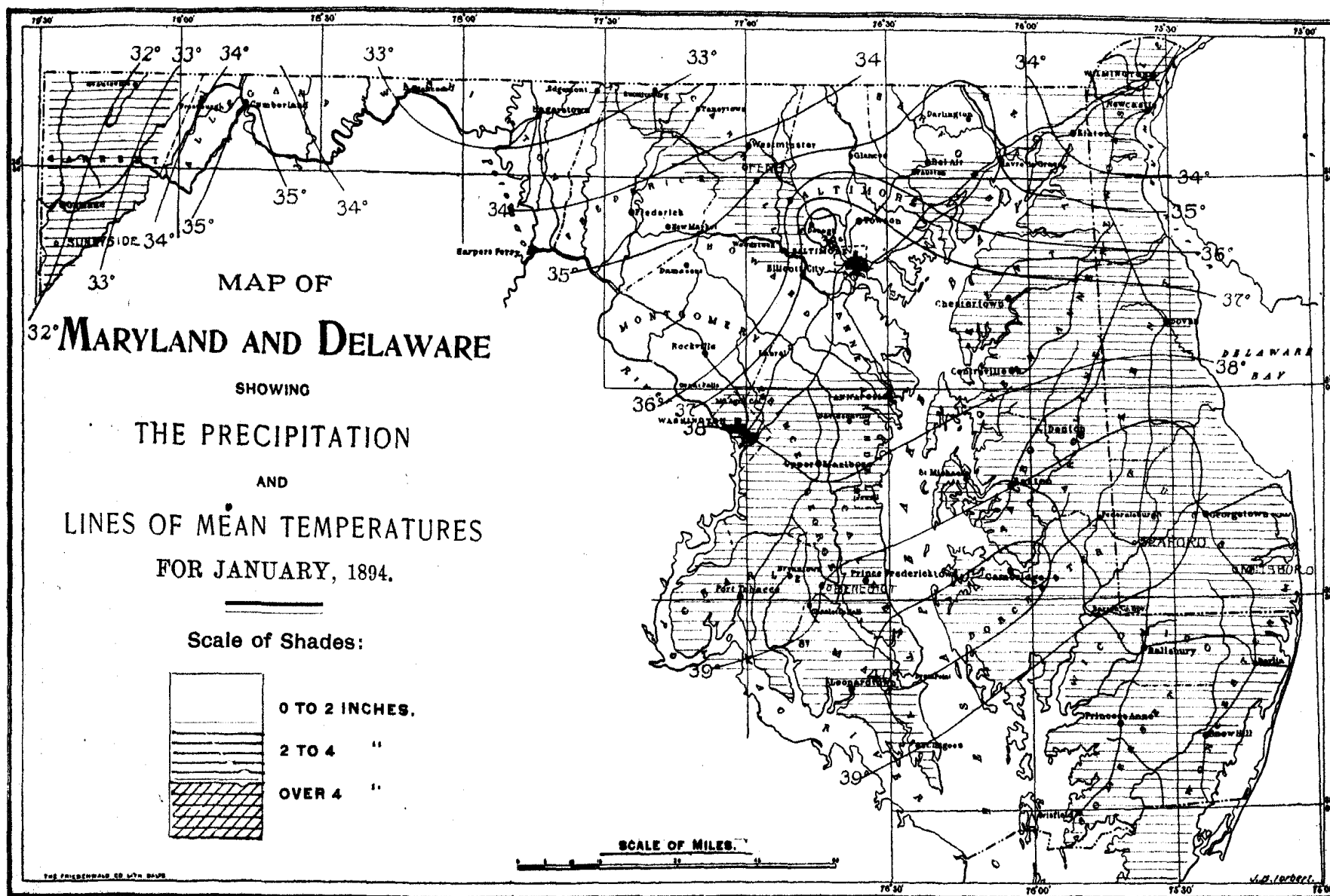
1871...35	1877...31	1883...32	1889...38
1872...34	1878...35	1884...32	1890...44
1873...34	1879...31	1885...34	1891...38
1874...39	1880...43	1886...29	1892...32
1875...30	1881...30	1887...32	1893...25
1876...41	1882...35	1888...29	1894...38

Mean temperature for this month for 24 years, 34. Total excess in temperature during month, 102. Total excess in temperature since January 1st, 102. Prevailing direction of wind, N. W. Total movement of wind, 5413 miles. Maximum velocity of wind, direction and date, 48, W., 30th. Total precipitation, 1.46 inches. Number of days on which .01 inch or more of precipitation fell, 12.

Total precipitation (in inches) for this month in

1871...1.55	1877...3.80	1883...3.16	1889...4.22
1872...0.88	1878...4.51	1884...4.81	1890...1.80
1873...4.27	1879...2.59	1885...3.07	1891...4.89
1874...2.22	1880...2.26	1886...4.48	1892...6.42
1875...2.51	1881...4.84	1887...2.57	1893...1.78
1876...1.67	1882...5.38	1888...3.35	1894...1.46

Average precipitation for this month for 24 years, 3.10. Total deficiency in precipitation during month, 1.74. Total deficiency in precipitation since January 1st, 1.74. Number of clear days, 12; partly cloudy days, 13; cloudy days, 6.



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

Stations.	County.	Meteorological Observer.	Displayman.
Annapolis	Anne Arundel.....	.....	W. M. Abbott.
Appleton	Cecil.....	.....	W. C. Henderson.
Bachman's Valley.....	Carroll.....	J. M. Myers.	.....
Baltimore.....	.....	G. N. Wilson.	.....
.....	.....	J. H. Donaldson.	.....
.....	.....	A. T. Brewer,	.....
.....	.....	Ass't Editor of Monthly Report.	.....
.....	.....	R. C. New,	.....
.....	.....	Ass't Editor of Weekly Bulletin.	.....
Barron Creek Springs... ..	Wicomico.....	A. E. Acworth.....	L. A. Wilson.
Benedict.....	Charles.....	Thomas Berry.	.....
Bel Air.....	Harford.....	.....	N. N. Nock.
Boettcherville.. ..	Allegany.....	F. F. Brown.	.....
Bradshaw	Baltimore.....	.....	B. F. Taylor.
Buckeystown.....	Frederick.....	.....	A. W. Nicodemus.
Cambridge.....	Dorchester.....	Calvert Orem.....	Calvert Orem.
Charlotte Hall.....	St. Mary's.....	J. Francis 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. Elliot.	.....
Dover, Del.....	Kent.....	Jno. S. Jester.....	Philip Burnet.
Easton.....	Talbot.....	G. W. Minnick.....	G. W. Minnick.
Edgemont.....	Washington	Chas. Feldman.	.....
Fallston.....	Harford.....	G. G. Curtiss, A. M.	.....
Fenby.....	Carroll.....	Wm. Fenby.	.....
Frederick	Frederick.....	.....	W. T. Delaplaine.
Frederica, Del	Kent.....	.....	Miss E. V. Newnom
Glyndon.....	Baltimore.....	.....	J. J. Dyer.
Grantsville... ..	Garrett.....	.....	T. H. Bittering.
Great Falls.....	Montgomery.....	Col. Elliot.	.....
Hampstead.....	Carroll.....	.....	H. H. Meals
Hartly, Del	Kent.....	.....	Miss C. A. Forde.
Havre de Grace.....	Harford.....	.....	W. S. McCombs.
Kirkwood, Del	New Castle.....	W. C. L. Carnagy.	.....
Laurel, Del	Sussex.....	.....	E. D. C. Hegemar
Lonaconing.....	Allegany.....	.....	J. J. Robinson.
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.
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.
Pocomoke City.....	Worcester.....	.....	R. M. Stevenson.
Receiving Reservoir, D. C.....	.....	Col. Elliot.	.....
Rising Sun.....	Cecil .....	.....	E. A. Reynolds.
Rockville.....	Montgomery.....	.....	Emmit 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 & Vincen
Solomon's.....	Calvert.....	W. H. Marsh, M. D.	.....
†Sparrow's Point.....	Baltimore.....	.....	Md. Steel Co.
Sunny Side.....	Garrett.....	John G. Knauer.	.....
Upper Marlboro.....	Prince George's.....	J. B. Perrie.	.....
Valley Lee.....	St. Mary's.....	J. Edwin Coad.	.....
Washington, D. C.....	.....	S. W. Beall.	.....
Westover.....	Somerset.....	.....	E. D. Long.
Wilmington, Del.....	New Castle.....	.....	Wm. Lawton.
Woodsboro.....	Frederick.....	.....	G. F. Smith.
Woodstock.....	Howard.....	T. J. A. Freeman, S. J.	.....
*Birdsnest, Va	Northampton	C. R. Moore.	.....
*Cape Charles, Va.....	Northampton.....	O. A. Browne.	.....
*Norfolk, Va.....	Norfolk.....	A. B. Crane.	.....
*Warsaw, Va.....	Richmond.....	C. H. Constable.	.....

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

MONTHLY SUMMARY OF REPORTS FOR JANUARY, 1894.

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.		Degrees	Min.									
									Date.	Date.											
WESTERN MARYLAND.																					
Sunny Side ¹	Garrett.....		39°20'	79°28'	31.4	39.1	23.7	56	24	3	26	53	2.84	12	9	9	11	S. W.			
Oakland ¹	Garrett.....	2380	39 25	79 20	31.9	40.3	24.4	56	5	9	25	47	3.70	11	6	14	10	S. W.			
Boettcherville ¹ * ..	Allegheny.....		39 33	78 48	34.4			64	5	14	26	50	1.30								
Cumberland (a) ¹	Allegheny.....	700	39 39	78 46	39.8	49.0	32.5	67	22	18	24	49	1.28								
Cumberland (b) ¹	Allegheny.....	700	39 39	78 45	35.0	62.2	27.7	64	5	14	25	50	1.50	16	8	7	6				
NORTHERN-CENTRAL MD.																					
Mt. St. Mary's ¹	Frederick.....	720	39 41	77 21	35.2	42.6	23.5	57	5	10	26	47	2.36	8	4	19	7	W.			
New Market ¹ * ..	Frederick.....	500	39 23	77 18	34.8			58	16	20	26	38	1.19	13	5	13	5	N. W.			
Taneytown.....	Carroll.....		39 40	77 9								1.74									
Bachman's Val. ¹ * ..	Carroll.....		39 40	77 1	30.2			50	5	12	26, 28	38	1.24	16	4	11	5	S.			
Fenby ¹ * ..	Carroll.....	950	39 33	77 5	34.4			60	5	16	26	44	2.00	10	11	10	7	N. W.			
McDonogh.....	Baltimore.....	545	39 23	76 46	138.4	46.7	30.0	59	1	16	25	43									
Woodstock Col. ¹	Baltimore.....	400	39 19	76 51	35.7	44.4	27.4	64	1	13	28	51	2.06	9	9	13	7	N. W.			
Baltimore.....		179	39 17	76 37	37.5	43.3	31.7	57	24	18	26	39	1.46	12	13	6	12	N. W.			
Fallston ¹ * ..	Harford.....	300	39 30	76 24	35.5			53	5, 16	18	26	35	2.08	4	19	8	13	N. W.			
Darlington.....	Harford.....	300	39 47	76 14	35.6	43.4	a27.7	54	22	16	26	38	1.52	14	4	13	4				
Great Falls ¹ * ..	Montgomery.....		39 0	77 14	35.9			53	14	13	28	40	1.56								
Dist. Res., D. C. ¹ * ..			39 9	77 0	37.2			55	14	18	28	37	1.15								
Rec. Res., D. C. ¹ * ..			38 52	77 0	36.9			54	14, 16	16	28	38	1.87								
Washington, D. C. ¹		112	38 52	77 0	37.8	44.4	31.1	58	24	17	28	41	2.14	15	1	15	14				
SOUTHERN MARYLAND.																					
Upper Marlboro.....	Pr. George's.....		38 47	76 45	37.8	46.6	29.0	57	4, 24	14	28	43		14	5	12		N. W.			
Benedict.....	Charles.....		38 31	76 39	39.2	46.8	31.5	62	26	20	13	42	2.37	12	4	15	6				
Charlotte Hall.....	St. Mary's.....		38 30	76 44	38.6	47.3	30.0	58	14, 16, 24	17	13	41	2.11	14	3	14	9	N. E.			
Valley Lee ²	St. Mary's.....		38 12	76 35	39.4							2.10		11	7	13	9	N. E.			
Solomon's.....	Calvert.....	20	38 19	76 27	40.8	47.7	33.8	60	14	23	26	37	2.43	7	5	19	11	N. E.			
EASTERN MD. AND DELAWARE.																					
Chestertown.....	Kent.....		39 13	76 7	b36.9	b43.4	b30.6	53	26	20	26	33	2.34								
Easton.....	Talbot.....	35	38 42	76 6	39.0	45.8	32.2	57	24	22	26	35	2.44	14	3	14	6	N. W.			
Cambridge.....	Dorchester.....		38 39	76 7	40.2	45.0	35.4	58	24	27	25, 28	31	3.13	0	15	16	7	N. W.			
Barron Ck. Spr. ¹	Wicomico.....	25	38 30	75 39	39.1	46.0	31.0	62	24	19	2	43	2.30	6	15	10	9	N. W.			
Kirkwood, Del. ²	New Castle.....		39 35	75 41	33.4																
Dover, Del. ¹	Kent.....	40	39 10	75 30	37.4	45.0	31.0	61	24	20	28	41	2.77	11	4	16	9	N. W.			
Milford, Del. ¹	Kent.....	20	38 45	75 25	39.0	47.2	30.8	62	24, 25	19	13	43	2.75	10	8	13	9	N. W.			
Seaford, Del. ¹	Sussex.....		38 40	75 35	39.6	48.5	29.7	62	24	20	13	42	2.85								
Millsboro, Del. ¹	Sussex.....		38 41	75 15	38.4	47.8	30.3	61	24	19	13	42	2.53	12	7	12	13	N. E.			
† VIRGINIA.																					
Norfolk.....					44.1	50.5	37.7	68	24	29	13	39	3.54	9	10	12	12	N. E.			
Warsaw.....	Richmond.....				c39.4	c48.1	c30.8	63	24	18	13	45	1.98					S.			
AVERAGES.																					
Western Maryland.....					34.5	47.6	27.1					49.8	2.12	13.0	7.7	10.0	9.0	S. W.			
Northern-Cent'l Md.....					35.8	44.3	27.9					40.7	1.72	11.1	7.1	12.7	7.8	N. W.			
Southern Maryland.....					39.2	47.1	31.2					40.8	2.25	11.6	4.8	14.6	8.8	N. E.			
East. Md. and Del.....					38.1	46.1	31.2					38.8	2.64	8.8	8.7	13.5	8.8	N. W.			
Entire territory.....					36.9	46.3	29.4					42.5	2.18	11.1	7.1	12.7	8.6	N. W.			

* 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:

¹ Mean of 7 a. m. + 2 p. m. + 9 p. m. + 4. ² Mean of 8 a. m. + 8 p. m. + 2. ³ 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.

DAILY PRECIPITATION FOR JANUARY, 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	Total.	
Sunny Side					.28	T	.06																										
Oakland...					†	.28	.05		T	T	.15			T	.13	.37		T	.14		.22			.11	.11		T		.55	.72		2.84	
Boettcherv.					.10	T					T				.15	.28			.01	.02		.37		.19			T		.85	1.50		3.70	
Cumb. (a).					.04						T						.05				.20						T		1.00			1.30	
Cumb. (b).																.09			.12		.24									.75	.30	1.28	
Mt. St. Mary's					.11						.08				.06	.02					.22				.02				1.60			1.50	
New Mark't					T						.10							T			.17			.13			.10		†			2.36	
Taneytown											T										.20			.20		.10				.62		1.19	
Bach. V'y											.10				T	T		T			.20			.14		.20			†	1.00		1.74	
Fenby						.06					.20					T	.10				.07			.04		.28				.80		1.24	
Woodst. Col					.10	.12	.09							T			T		T		.12			.13	.20	.20		.20		1.30		2.00	
Baltimore...					.06	T	.02		T	T	.05	T			.01	.07		T	T		.08			.05	.04	.05	.05			.55	.44	1.46	
Fallston				.10	.05	T					T				.08			T			.07	.03							1.32			2.08	
Darlington							.08				T							T												.22		1.52	
Great Falls						.08	.05	.07		.02	.04	.02													.06		.13		.22	.84		1.56	
Dist. R., D.C						.10		.05		.02	.22	.09													.12		.07		.16	.25		1.15	
Rec. R., D.C						.12		.09		.04	.17	.14													.25		.08		.16	.73		1.87	
Wash., D. C.					.12	.01	.11			.03	.26	.01			.03			T	T		.10			.22	.08	.01	.10		.77	.29		2.14	
Benedict					.08					.10	.55				.04																1.55	2.37	
CharleHall					.08	T	.20			.18	.13					.06										.22	T	.15	1.00			2.11	
Valley Lee							T	.35		.18	.12		.02			.10			.02				.06			.80	T	.56		.25	.84	2.10	
Solomon's...					.04	.02	.48		.02	.16	.12				.04	T		T								T				.88		2.43	
Chestert'n...					T	T	.07	.10			.36				.06	.07													1.60			2.94	
Easton							.16			.32	.20										.29									.92		2.44	
Cambridge					.13		.50			.20											.80				.10					.92		3.13	
Barron C.S.					.05	T	.39		.05	.02	.08				.08					T				†						1.00		2.30	
Dover, Del.					.04	†	.11		†	†	.22				.06		T		.03					†	.28		.25		.79	†		2.77	
Milford, Del							.22		†	†	.20				†				.01		.05				.14		.05		.99		1.02	2.75	
Seaford, Del					.08	T	.42		†		T				15	†	.04				.06			.03	.34	†	.64			.93		2.85	
Millsb'o, Del					.04		.38		.05	.14	.02				.03						.02			T		.33	.35	.30		.60	.23	2.53	
Norfolk, Va						.15	.90		.25	.11	.55				.07		T		T					T	.18	.23	.44	T		.61	.04	3.64	
Warsaw, Va								.32			.28				.20							.01	.06							.44	.34	1.96	