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. V, NO. 8. MONTHLY REPORT. DECEMBER 9, 1895.

Contains Review for the Month of November.

Natural Rain-Makers.

By ALEXANDER MCADIE.

The efficiency of the clouds in lifting water will be brought home to us if we consider the rainfall over a garden fifty feet wide and one hundred feet in length. If one hundredth of an inch of rain occurs, about twenty-five gallons or two hundred and fifty pounds of water will have fallen. One inch of rain over the garden would mean twenty-five thousand pounds of water.

A rainfall of forty-five inches in a year is not an unusually large rainfall. New York city has a mean annual rainfall of 45.2 inches, the observations covering a period of twenty-two years. If this rain of a year fell in equal amounts each day, we would have for every acre of surface two thousand eight hundred gallons of water, or in avoirdupois nearly nine thousand tons of water to the square mile. Tipping Manhattan Island each evening and draining it would give two hundred thousand tons of water. In a year over seventy million tons of water are dropped on the roofs, sheds, and pavements of Manhattan Island.

It requires a powerful pump to lift water in such quantities and store it in reservoirs thousands of feet above us. And these reservoirs are remarkable; for they have no walls of rigid masonry, and they course across the sky at higher speed than man can travel. A locomotive can travel a mile in thirty-seven seconds, a fast yacht in about twice that time, and a swift torpedo boat in one hundred and ten seconds. The upper clouds move with an average velocity of a mile in thirty-six seconds, and have been observed moving as rapidly as a mile in eighteen seconds. Equally remarkable are the plastic walls of these aerial reservoirs. No courses of heavy stone and mortar are to be found; but in their stead drops of water so minute that a thousand of them side by side would not extend farther than one inch. If the temperature was low during the building of the cloud, the water drops are changed into ice spicules and snowflakes.

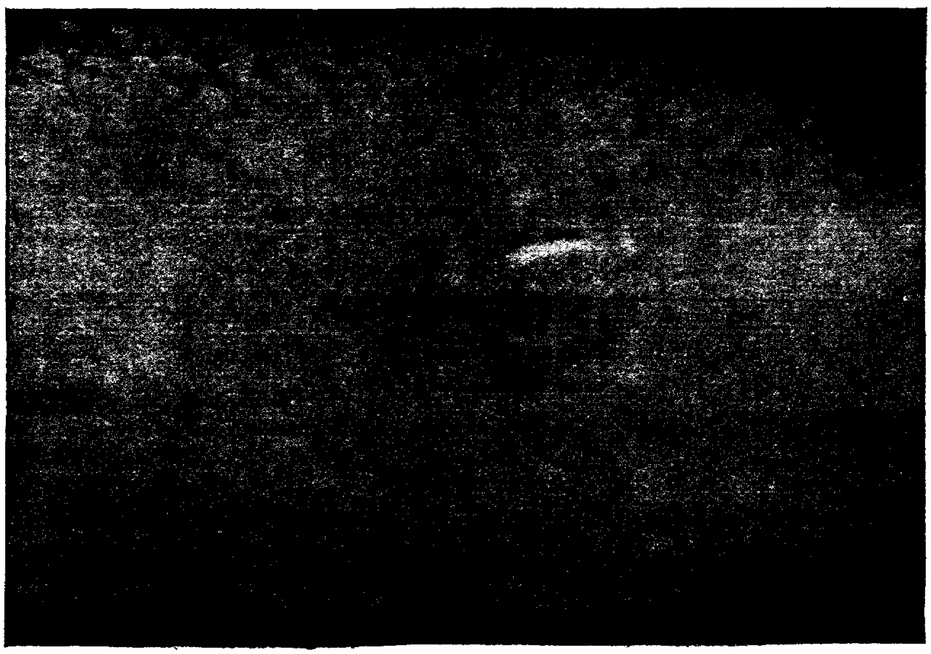
From such reservoirs the rain falls as a rule harmlessly. A collapse, which rarely occurs, is known as a cloud-burst. Then, the deluge destroys life and property, sweeping all before it.

If we were able to control the valves and vents of this tremendous pump-reservoir, we could cause rain at will and shut off the downpour at pleasure. But hardly yet may we hope to master the rain. Rain-makers of our time bang and thrash the air, hoping to cause rain by concussion. They may well be compared to impatient children hammering on reservoir walls in a vain endeavor to make the water flow. Rain-control is a scientific possibility. Successful rain engineers will come in time, we venture to predict, from the ranks of those who study and clearly understand the physical processes of cloud formation.

Cloudland, for a realm so near us and so closely associated with our welfare, has been sadly slighted by man's genius. The ancients were surprisingly stupid in their views and discussions of air, wind, and clouds. The wisdom of Aristotle, filtered through the mind of his favorite pupil Theophrastus of Eresus, does not show to advantage in these subjects. Nor have the moderns achieved much that is worthy of detailed mention until a comparatively recent period.

Our cloud names date from the beginning of the century. At a meeting of the Askesian Society in 1802, a young chemist of Tottenham read an essay in which he proposed the terms stratus or sheet, cumulus or heap, and cirrus or feather for cloud names. One attempt at cloud classification had been made previously, but Howard's scheme was so superior that it at once received recognition. The essay was reprinted, translated, and officially adopted in all the great countries of the world. While Howard's name is known to all meteorologists, little has been handed down concerning the man himself. He is quaintly described on the title-page of his three-volumed Climate of London, as a Citizen of London, Honorary Citizen of Magdeburg, and Honorary Associate of the Art Societies of Hamburg and Leipsic. No less a person than Goethe was among those who were charmed by Luke Howard's work. A friendship sprang up, a long correspondence was carried on, and the poet sings of Howard as one worthy of all honor.

Within the past few years the leading countries of the world through their representatives on the International Meteorological Committee have decided to depose the Howardian nomenclature. The proposal was made four years ago at the Munich Conference, and at Upsala last year a new classification was formally approved. Some of the more prominent sponsors for the new system are Hildebrandsson, Köppen, Neumayer, and Rotch. Modern meteorology demands more than a record of the appearance of the cloud. It seeks the meaning of each formation. The cloud is primarily valuable not on account of its beauty, but because it makes manifest atmospheric motions and conditions not otherwise noticeable. A striking illustration of the use which modern meteorology makes of the clouds is found in the storm of August 26 to 29, 1893. This is the storm more familiarly known as the Sea Islands storm, in which eleven hundred lives were lost. At a critical moment the telegraph lines were blown down and all reports were missing south of Savannah. It is said that the storm center was accurately located by the forecasting officials by means of the clouds at distant stations.



ALTO-CUMULUS.

Great progress has been made in the past five years in our knowledge of clouds. Two masters in physical science, von Helmholtz and Hertz, were brilliant cloud investigators. The former explained the formation of cloud billows; the latter devised a graphic method of following the adiabatic changes in moist air. The number of tiny solid particles in a cloud can even be counted. John Aitkin, of Edinburgh, has constructed a dust-counter delicate enough to do this. The dust nuclei in the smoky air of London, on the quiet shores of the Mediterranean, on Alpine peaks, or in the pure mists of the Scotch Highlands can be counted and their influence in the making of rain properly appreciated. Both in Europe and the United States meteorologists are studying clouds. At Berlin, Storlein, Upsala, and Blue Hill observers are daily determining cloud heights and velocities, and in the coming year forces will be massed and something akin to a systematic survey of cloudland attempted.

Poet, painter, and all of us have felt the keen delight of following the cloud transitions of a summer sky. All men in all lands are nephelolaters or cloud admirers—for the cloudscape gives all that the most varied landscape can offer. A generous sky knows no difference between the sons of earth, and spreads everywhere scenes of wondrous grace and color. Even the most commonplace cloud formation—fog—which on earth is often aggravating and trying to health and temper, becomes beautiful as soon as it leaves the earth.

FRACTO-NIMBUS. Advance Clouds of Thunderstorm.

A fog may be defined as a cloud viewed from within, and is therefore the first distinct cloud type. The next low type is the stratus or "raised fog," less than one thousand metres high. And here it may be noticed that in summer the earth pushes her cloud mantle away from her and draws it closer to her in winter. In other words, clouds are lower in winter than in summer. The highest cloud is the cirrus, with a mean elevation of nine thousand metres. The cirrus is a fine, featherlike cloud, and its neighbor, cirro-stratus, something like it, only more diffuse and lower. When a veil of cirro-stratus is drawn before the sun or moon, large halos forty-four and eighty degrees in diameter, with faint red on the inside or nearest the sun, and blue on the outside, appear. These are caused by the refraction of light by ice crystals. A lower cloud, alto-stratus, without causing halos may cause coronæ or smaller circles of prismatic colors, about one-fourth the diameter of halos. In coronæ the red is on the outside. The Brockenspecter is a particular kind of coronal cloud shadow. Midway between high and low clouds are the cirro-cumuli and alto-cumuli. These give perhaps the most beautiful of all cloud effects. The fairest meadows of earth seldom show such flocks grazing so leisurely and scattered so harmoniously. Cirro-cumuli are small, white, fleecy clouds, often arranged in rows, while the alto-cumuli are denser, larger, and less regular. Both types are like tranquil fleets upon a serene sea. "Their very motion is rest," as John Wilson said of them long ago. Trailing in lustrous glory before the midnight moon, they turn into silver bars and "streak the darkness radiantly." Of the low clouds, the strato-cumuli and nimbi are most common: the former, large rolls of dark cloud, often covering the whole sky and of somewhat dreary aspect; the latter, nondescripts without definite form and with little gradation in color. The sky effects of both are as a rule somber and depressing, though there are times, especially if the sun be close to the horizon, when the nimbus gives the golden rain of Greek mythology, a downpour inexpressibly beautiful. The cumuli and cumulo-nimbi are the largest clouds in cloudland. The familiar "castles in air" are the turreted cumuli, thick clouds with domes and summits. The cumulo-nimbus, or towering thunder cloud, rises mountain high, and has peaks of snowy whiteness with a flat and frowning base. Its monstrous size can be better appreciated if we imagine Mont Blanc (14,134 feet high) lifted into the air and set down on top of Mount Washington (6279 feet). This would make a medium-sized cumulo-nimbus. The thunder cloud is noteworthy in another respect, namely, that the water in it may be cooled below the freezing point and yet not frozen. A snowflake or ice crystal falling into it may suffice to start a sudden congelation, just as we may see ice needles dart in all directions when the chilled surface of a still pond is disturbed. We liken this monstrous cloud to a huge gun loaded and quiet, but with a trigger so delicately set that a falling snowflake would discharge it. The sudden puffs, gusts, and elongations of the thunder cloud may have their origin in this way. Again, there is every reason for believing that electricity plays an important part in the enlargement and subsequent history of this cloud. We have ourselves measured with sensitive quadrant electrometers the pull in volts experienced by the air between one of these clouds and the ground. The approach of the cloud can be foretold *without seeing it* and the sky mapped out roughly by the changes in the electrical potential caused by the passage of the cloud.

CUMULO-NIMBUS.

From what precedes it will be readily understood that cloud motion is not always a true exponent of air motion. Meteorologists know that it is not safe to obtain the motion of the air currents from the motion of the clouds, for the latter may move faster or more slowly, or even apparently stand still in the wind, as in the "tablecloth" cloud on Table Mountain at the Cape of Good Hope. In reality the cloud is changing rapidly, forming and dissolving at one and the same time.

In forecasting weather, clouds have, as we all know, special significance. They are the true robes and garments of earth. The poet sings of hills clad in verdure, the mantle of tender green that the Earth puts on in the spring, and the splendid hues of her autumnal dress; but the garment which protects old Earth the year round from extreme temperatures is the cloud layer. Where there is little cloudiness the range of temperature is large, and where there is much cloudiness the temperature is very even.

So, while the clouds delight us, they are also active for our welfare. In never-ending procession they move—ragged ranks of fracto-nimbi jostled by frowning cumli, tatterdemalion scud leading an army of mighty nimbi, the baleful funnel cloud, hovering and ill-omened, rolling strati-cumuli that lie far out on the flank; thus they pass, while in the calm above appear the cirri dainty and lacelike, or curling wisps of laughing cirro-stratus.—*The Popular Science Monthly.*

MISCELLANEOUS NOTES.

Dr. J. Lee McComas, the voluntary observer at Oakland, Md., visited the Central Office on November 31st. Dr. McComas read a paper before the Congress of Medico-Climatologists at the World's Columbian Exposition, Chicago, in 1893, his subject being "The Climate of the Alleganies." His manuscript, which was left with the secretary of the Congress, has not been returned to him, and the original draught has been mislaid, but if the latter can be found it will be furnished, later, for this publication. On account of the prominence of Dr. McComas, and from the fact that he has made a study of the climate of his section for many years past, the article in question would doubtless prove a valuable acquisition to our weather service literature.

Prof. Willis L. Moore, Chief of the Weather Bureau, lectured before a Farmers' Institute, at Kensington, Md., on November 27th. The Institute was a particularly successful one. Besides the discourse by Prof. Moore, addresses were made by President Sylvester of the Maryland Agricultural College, Dr. Thomas Wilson, Curator of the Smithsonian Institution, Prof. Otis T. Mason of the National Museum, Dr. D. G. Salmon, Chief of the Bureau of Animal Industry, Profs. Miller, Daniels and Robinson of the Maryland Agricultural College, and other men of note.

Occasional complaints have been made by voluntary observers and others of the non-receipt of State Weather Service Reports. This failure to receive the Reports is owing to the fact that some of the gummed slips, bearing the addresses, fail to stick to the mailed papers. After each mailing, papers are returned for direction, and of course it is then impossible to tell where they should be sent. Missing numbers will be supplied upon application.

Review of the Month—November.

WEATHER.

Temperature (degrees).—Monthly mean (entire territory), 45.9, being 1.9 above the normal; highest monthly mean, 52.8, at Pocomoke City; lowest monthly mean, 37.8, at Oakland and Deer Park; highest temperature, 81, at Hancock, on the 9th; lowest temperature, zero, at Deer Park, on the 14th; greatest local monthly range, 70, at Deer Park; least local monthly range, 40, at Annapolis; monthly mean range (entire territory), 53.6; monthly mean maximum, 54.8; monthly mean minimum, 33.2.

Precipitation (in inches).—Average, 1.41, being 2.21 below the normal; greatest amount, 3.51, at Mardela Springs; least amount, 0.34, at Cumberland (E. T. Shriver). The greatest fall of snow during the month, in Maryland, 3.0, is reported by the observer at Oakland. The next greatest fall, 2.0, is reported by the observer at Sunnyside. Deer Park and Grantsville report 1.0.

Wind.—Prevailing direction, northwest. Total movement in miles, Philadelphia, Pa., 7195; Baltimore, Md., 5373; Washington, D. C., 4524; Norfolk, Va., 6205.

Thunderstorms.—At Bachman's Valley, on the 17th; at Chestertown, on the 26th; at Charlotte Hall, on the 26th; at Denton, on the 26th; at Jewell, on the 26th; at Mardela Springs, on the 17th, 26th; at Milford, Del., on the 26th; at Newark, Del., on the 26th; at Pocomoke City, on the 25th; at Princess Anne, on the 26th; at Seaford, Del., on the 26th; at Solomon's, on the 26th (2).

Hail.—At Bachman's Valley, on the 10th; at Lisbon, on the 2nd, 10th; at New Market, on the 2nd, 10th; at Wilmington, Del., on the 2nd, 10th; at Woodstock College, on the 10th.

Sleet.—At Laurel, on the 10th; at Oakland, on the 26th; at Sharpsburg, on the 2nd; at Wilmington, Del., on the 2nd, 10th.

Fogs, dense.—At Bachman's Valley, on the 6th; at Jewell, on the 4th, 5th, 6th, 7th, 8th, 18th, 25th; at Millsboro, Del., on the 5th, 6th, 17th, 18th, 29th; at Pocomoke City, on the 17th, 18th, 30th; at Wilmington, Del., on the 1st, 5th, 6th, 7th, 8th, 9th, 14th, 16th, 18th, 24th, 25th.

Halos, Solar.—At Cumberland (Shriver and Rizer), 18th.

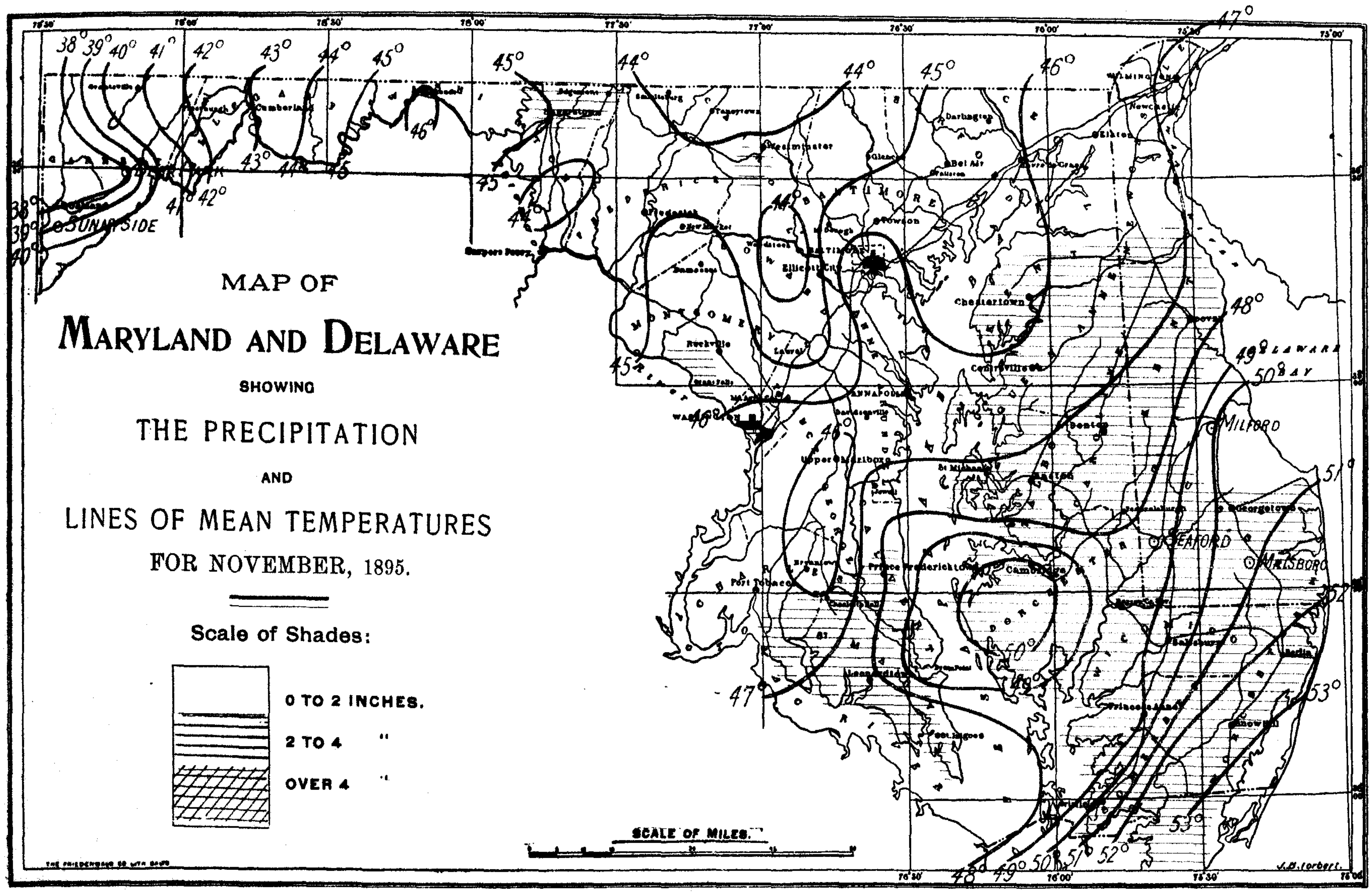
Corona, Solar.—At Lisbon, on the 16th.

Corona, Lunar.—At Lisbon, on the 1st, 23rd; at Millsboro, Del., on the 22nd, 25th, 29th; at Wilmington, Del., on the 1st.

Polar Bands.—At Cumberland (Shriver and Rizer), on the 16th.

Auroras.—At Lisbon, on the 9th, 12th, 18th; at Mardela Springs, on the 19th; at Millsboro, Del., on the 19th; at Solomon's, on the 9th.

Earthquake Shock.—At Wilmington, Del., on the 20th.


MAP OF
MARYLAND AND DELAWARE
SHOWING
THE PRECIPITATION
AND
LINES OF MEAN TEMPERATURES
FOR NOVEMBER, 1895.
Scale of Shades:
0 TO 2 INCHES.
2 TO 4 "
OVER 4 "
SCALE OF MILES.
SUNNYSIDE
MILFORD
SEAFORD
MILLSBORO
Chestertown
Westminster
Rockville
Cumberland
Ellicott City
Towson
Bel Air
Upper Marlboro
Port Tobacco
Annapolis
Salisbury
Princess Anne
Snow Hill
Berlin

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

Stations.	Counties.	Meteorological Observers.	Displaymen.
Annapolis	Anne Arundel	J. E. Abbott.	W. M. Abbott.
Appleton	Cecil		W. C. Henderson.
Bachman's Valley	Carroll	J. M. Myers.	
Baltimore		C. P. Cronk. A. T. Brewer.	Weather Bureau
Baltimore, (The Anchorage)			Thos. Hansen.
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.
Burkittsville	Frederick	J. P. Stifer.	
Cambridge	Dorchester	J. S. Shepherd.	Samuel Lehman.
Charlotte Hall School	St. Mary's	J. Francis Coad.	
Cherryfields.	St. Mary's	J. Edwin Coad.	
Chestertown	Kent	Hon. M. deK. Smith.	
Cumberland	Allegany	Shriver and Rizer. E. T. Shriver.	
Darlington Academy	Harford	Prof. A. F. Galbreath.	
Deer Park	Garrett	S. P. Specht.	
Delaware City, Del.	New Castle		W. E. Reybold.
Denton	Caroline	F. C. Ramsdell.	
Dickerson	Montgomery		W. H. Dickerson.
Distributing Reservoir, D. C		Maj C. E. L. B. Davis.	
Dover, Del	Kent	Jno. S. Jester.	
Easton	Talbot	Henry Shreve	Henry Shreve.
Fallston School	Harford	G. G. Curtiss, A. M.	
Flintstone	Allegany		N. T. Downes.
Frederick	Frederick	McClintock Young,	"The News."
Frostburg	Allegany		J. N. Benson.
Frederica, Del	Kent		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	Maj. C. E. L. B. Davis.	
Green Spring Furnace	Washington	E. G. Kinsell.	
Hagerstown	Washington	Prof. C. E. Carl	Jas. P. Harter.
Hampstead.	Carroll		H H. Meals.
Hancock	Washington	Dr. J. S. Diehl.	
Hartly, Del.	Kent		Miss C. A. Forde.
Havre de Grace	Harford		W. S McCombs.
Jewell	Anne Arundel Co	Jos. Plummer.	
Johns Hopkins Hospital, Baltimore		W. L. Woods.	
Kenton, Del	Kent		W. S. Arthurs.
Kirkwood, Del	New Castle	J. S. Carnagy.	
La Plata	Charles	J. S. Turner	J. S. Turner.
Laurel,	Prince George's	Dr. T. M. Baldwin.	
Laurel, Del.	Sussex		E. D. C. Hegeman.
Lisbon	Howard	W. W. Warfield, Jr.	
Lonaconing	Allegany		J. J. Robinson.
Mardela Springs	Wicomico.	A. E. Acworth	L. A. Wilson.
Maryland Agricultural College	Prince George's	Prof. J. H. Patterson.	
McDonogh School	Baltimore	H. Norwig.	
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 College	Frederick	J. A. Mitchell, Ph. D.	Jos. H. Martin.
Newark College, Del.	New Castle	Prof. Wm. H. Bishop.	
Oakland	Garrett.	J. Lee McComas, M. D.	J. L. McComas, M. D.
Odenton	Anne Arundel		E. B. Watts.
Princess Anne.	Somerset.	Jas. R. Stewart.	
Pocomoke City	Worcester	R. M. Stevenson.	R. M. Stevenson.
Pope's Creek	Charles.	George Dent.	
Receiving Reservoir, D. C.		Maj. C. E. L. B. Davis.	
Rising Sun.	Cecil		Dr. L. R. Kirk.
Salisbury.	Wicomico		W. Benjamin. L. W Gunby.
Seaford, Del.	Sussex	H. L. Wallace	H. L. Wallace.
Sharpsburg	Washington	R. L. Hiberger.	
Snow Hill	Worcester		Purnell & Vincent.
Solomon's	Calvert	W. H. Marsh, M. D.	
St. Charles Coll., nr. Ellicott City	Howard	Rev. H. M. Chapuis, S. S.	
Sunnyside	Garrett	John G Knauer.	
Sykesville	Carroll		J. S. Hyatt.
Upper Marlboro	Prince George's	J. B. Perrie.	
Washington, D. C		S. W. Beall.	
Western Port	Allegany	Prof. O. H. Bruce.	
West Friendship.	Howard		Postmaster.
Westminster	Carroll	Prof. Roland Watts.	
Westover.	Somerset.		E. D. Long.
Wilmington, Del.	New Castle	F. C. D. McKay	Wm. Lawton.
Woodsboro	Frederick		G. F. Smith.
Woodstock College	Baltimore	T. J. A. Freeman, S. J.	
Woman's College, Frederick.	Frederick	Miss W. A. Lantz.	

U. S. WEATHER BUREAU STATIONS FURNISHING REPORTS.

Baltimore, Md	J. R. Marbury. G. N. Wilson.	Weather Bureau.
Norfolk, Va	Jas. J. Gray.	
Philadelphia, Pa	L. M. Dey.	
Washington, D. C.	S. W. Beall.	

DAILY PRECIPITATION FOR NOVEMBER, 1895.

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
Sunnyside		T						.14	.10	.30					.18				†	.52	.05		T	.11	.14	T			.14	T	1.68
Oakland	.05	.02						.21	.05	.27				.05	.13		T		.15	.32			.02	.14	.05	.11			.11	T	1.68
Deer Park										.50					.20					.10				.14							0.94
Grantsville								.10	.15						.15					.15		.15	.10			.20					1.00
West'nport.							.15	.10	.05					.10	.05				.06	T				.10	.09						0.70
Boettcherv.								.20							.10						.10				T						0.40
Cumb. (1)								.08							.15									.04		.07					0.34
Cumb. (2)																															
Hancock								.11	.07						.34					.11					.40	.60					1.63
Gr'nSp.Fur.	T	T						.31	.16					†	.67					.15					†	.25					1.54
Hagersto'n.								1.40	.22						.50										.29	.23					1.64
Sharpsburg		T			T			.34	†	.25				T	.40				.22		T		T	.05	.07	.12					1.45
Burk'sville.																															
Mt.St.M'y's Col.																															
Fred'k.	.26	.03						†	.05	.13				.05	.27					.26					.15	.28					1.48
Woman's Col.		T						.02		.05				.35										.02	.02						0.46
New Mark't		.07						T	†	.46				.30						.20				†	†	.45					1.48
Bach. V'y	.04	T			T				.08	.40	T				.34					.24				.09	.27	.34					1.80
WestMd.Col	.12									T					.80					.23				.18	.27	.54					2.14
Woodst. Col	T	T						.05		.28				.06	T					.12				.10	†	.15					0.76
Baltimore	.02	.13				T	T	.04	T	.32				.10	.05					.05				.04	.05	1.06					1.86
Lisbon	.03	.06			T	1.62		.05	.04	.14				.24	.38					T			T	.16	.18	.05					1.35
St.Chas.Col.		T			T	T		T						.15	.02									.08	.12	.45					0.82
Great Falls	.95	.06								.45	.18				.17					.30						.21					2.32
Falls'n Sch.		.09					.02	.03		.25				.18	.07					.05					.19	.10	.72				1.70
Dar'g'nAca'y		T						.15						†	.23									†	†	.88					1.39
Annapolis	.02	.11				T	.04	.06	T	.37				.08	.03					.06				.04	.03	1.03					1.87
Jewell		.40								.55				.14			T			.05				T	T	.50					1.64
Dist. R., D.C	1.23	.06	.03							.20	.30				.06	.02				.02						.21					2.13
Rec. R., D.C	1.21	.05								21	.22				.14	.02				.15						.05					2.05
Wash., D. C.	.01	.10			.01	T	T	.05		.57	T			.10	.03		.01			.13				.07	.03	.15					1.26
Md. Agr'l Col.		.12						.08		.61				.09	.08					.08					T	.90					1.96
Laurel.										.50				.15	.10											.80					1.55
Up. Marlb.		.27												.24	.04					T				T	T	.45					1.00
La Plata					.70															.20											0.90
Solomon's		.74					T	.04		.68				.09	.02	T	.03			.04				T	.03	.84					2.51
Charl. HallSch		.58			T					.68				.30						T					.03	.61					2.20
Cherryfields		.85								.90				.10						T				.06	.05	.50					2.46
Chestert'n		.40												.40	.22									T	.28	.92					2.22
Denton		.50							1.10																		1.00				2.60
Easton		.49								.54					†	.19										1.34					2.56
Cambridge	.27	.60								.60				†	.18		.05			.07					†	†	.80				2.57
Mardela Sp.	.74								.02	.74					.36		37			.07					T	†	1.21				3.51
Pri'cess An.		.90								.65				.20	.03		.01								.09	.19					2.07
Poc'm'k Cit	.02	1.15						.05		.57	.01			.21	.05		.04			.10					T	.30					2.50
Wilm't. Del.		.19						.01	.01	.17				.03	.13		.02			.02					.14	.15	.70				1.57
Delaware Col. Newark, Del.		.16					T	.06	.19						.13		.02							.12		.38					1.06
Dover, Del.		.39							†	.31					.31		.04			.10					.11	1.00					2.26
Milford, Del															.49											1.00					1.49
Seaford, Del		.63								.47				†	.14		.06			.10					†	1.20				T	2.60
Millsb'o, Del		.99					T			.54				.14	.20		.17			.14					.03	.45					2.66
Phila. Pa.	.12	.18						.01	.04	.19				.03	.24		.05			.08				09	.21	1.08					2.32
Warsaw, Va	1.30	.73							.90						.10												1.05				4.08
Birdsnest, Va.	†	1.00			.10		.10			.50		.35		.25						.10							.05				2.45
Norfolk, Va	T	1.01					.04	.02		.87	.16	.83	.01	.16	.04		T			.13					.05	.09					3.41

NOTE.—"T" indicates a trace of rain or melted snow. † Not measured until next observation.

Reports for October, 1895, received too late for earlier publication.

STATIONS.	COUNTIES.	Altitude above sea in ft.	Latitude.	Longitude.	TEMPERATURE. Monthly Mean.	Mean of Max.	Mean of Min.	Max. Degrees	Max. Date.	Min. Degrees	Min. Date.	Monthly Range.	Total Precipitation.	Total Snow-fall.	Clear Days,	Partly Cloudy Days.	Cloudy Days.	Rainy Days. (.01 in. or more)	Prevailing Winds.
NORTHERN-CENTRAL MARYLAND.																			
Mt. St. Mary's College, d 1*	Frederick	720	39 43	77 20	50.6	....	......	72	19	32	30	40	1.65	....	...	....	...	....	
SOUTHERN MARYLAND.																			
Annapolis	Anne Arundel	20	39 58	76 30	54.4	63.6	45.1	76	3	33	31	43	.. ...	....	....	....	...	....	
Md. Agricultural Col., Col. Park	Pr. George's	....	38 58	76 56	52.4	66.8	38.0	77	3, 19, 27	26	30	51	1.89	...	....	...	....	....	
Charlotte Hall Sch	St. Mary's	....	38 28	76 48	51.0	64.4	37.7	76	7	23	29	53	2.56	....	21	8	2	3	N.W.

* See foot-note on next page.

MONTHLY SUMMARY OF REPORTS FOR NOVEMBER, 1895.

Stations.	Counties.	Altitude above sea in ft.	Latitude.	Longitude.	Temperature. Monthly Mean.	Mean of Max.	Mean of Min.	Max. Degrees.	Max. Date.	Min. Degrees.	Min. Date.	Monthly Range.	Total Precipitation.	Total Snow-fall.	Clear Days.	Partly Cloudy Days.	Cloudy Days.	Rainy Days. (.01 in. or more)	Prevailing Winds.
Western Maryland.																			
Sunnyside	Garrett	2440	39°20′	79°21′	39.6	50.9	28.3	73	7	11	22	62	1.68	2.0	12	5	13	8	S. W.
Oakland	Garrett	2380	39 24	79 18	37.8	48.3	27.2	69	7	10	22	59	1.68	3.0	11	13	6	14	S. W.
Deer Park	Garrett	2457	39 25	79 13	37.8	49.5	26.1	70	7	0	14	70	0.94	1.0	....	....	....	....	.....
Grantsville	Garrett	....	39 45	79 10	41.0	51.4	30.7	72	7	14	22	58	1.00	1	15	4	11	7	W.
Westernport	Allegany	....	39 28	78 2	40.6	52.8	28.5	78	9	17	29	61	0.70	T	....	....	....	....	.....
Boettcherville [1]*	Allegany	....	39 39	78 48	43.0	......	......	78	9	18	28, 29	60	0.40	...	....	....	....	....	.....
Cumberland,‡ Shriver & Rizer.	Allegany	650	39 39	78 46	49.5	62.6	36.4	86	8	24	13	62	0.43	....	....	....	...	....	.....
Cumberland, E. T. Shriver.	Allegany	700	39 39	78 45	42.8	50.4	35.2	74	9	22	13,28,29	52	0.34	....	18	7	5	4	.....
Hancock	Washington	....	39 40	78 10	46.0	58.4	33.6	81	9	18	28	63	1.63	....	14	10	6	6	W.
Green Sp. Furnace	Washington	500	39 39	77 55	43.6	53.6	33.6	79	9	19	29	60	1.54	....	12	8	10	5	W.
Hagerstown	Washington	...	39 39	77 43	45.0	54.2	35.9	77	9	24	21	53	2.64	..	12	2	16	5	.....
Sharpsburg	Washington	....	39 25	77 45	43.9	51.8	36.0	76	9	23	22,28,29	53	1.45	T	15	6	9	7	N.W.
Northern-Central Md.																			
Burkittsville	Frederick	...	39 25	77 35	......	......	......	....	....	....	.....	...	......	...	....	....	....	....	.....
Mt. St. Mary's Col.	Frederick	720	39 43	77 20	......	......	......	....	....	....	.....	...	......	...	....	....	....	....	.....
Frederick	Frederick	280	39 24	77 18	44.8	53.5	36.1	75	9	24	21,22,24	51	1.48	....	11	9	10	9	.....
Woman's Col. Fred.	Frederick	280	39 24	77 18	46.0	54.6	37.5	75	9	21	11	54	.46	T	21	3	6	5	N.W.
New Market	Frederick	500	39 23	76 27	46.0	54.5	37.6	83	10	23	3, 21, 28	60	1.48	T	14	5	11	7	N.W.
Bachman's Val.	Carroll	...	39 37	76 55	43.4	52.7	34.0	75	9	20	22	55	1.80	T	14	6	10	8	N.W.
Western Md. Col. Westminster.	Carroll	....	39 25	77 0	49 0	58.9	39.1	74	9, 10	21	21	53	2.14	....	20	4	6	5	...
McDonogh School, d	Baltimore	535	39 23	76 44	46.6	53.6	39.7	74	9	24	22	50	......	...	...	....	....	....	.....
Woodstock Col.	Baltimore	392	39 20	76 49	44.0	53.2	34.8	75	9	20	22	55	.76	T	9	10	11	6	E.
Baltimore	....	...	39 17	76 36	47.2	54.2	40.0	77	9	26	21	51	1.86	T	12	8	10	10	N.
Johns Hopkins Hos	....	....	39 17	76 36	45.8	54.4	37.1	77	9	25	21, 22	52	......	....	....	....	....	....	.....
Lisbon	Howard	....	39 20	77 40	43.8	53.2	34.3	75	9	22	21	53	1.35	....	14	6	10	10	N.
St. Charles Coll. nr Ellicott City.	Howard	300	39 16	76 44	49.0	56.1	41.8	76	9	30	21, 22	46	.82	T	23	....	7	5	N.W.
Great Falls [5]*	Montgomery	....	39 0	77 14	45.4	......	......	76	9	23	29	53	2.32	....	...	....	....	....	.....
Fallston School, [1]*	Harford	450	39 31	76 24	45.5	.....	......	75	9	24	21	51	1.70	T	9	10	11	11	E.
Darlington Acad'y†	Harford	300	39 39	76 14	45.2	53.4	37.0	74	9	22	22	52	1.39	T	18	5	7	6	N. E.
Southern Maryland.																			
Annapolis	Anne Arund'l	20	39 58	76 30	46.2	51.0	41.4	67	26	27	22	40	1.87	....	12	....	18	11	.....
Jewell	Anne Arund'l	....	38 44	76 36	47.6	55.6	39.5	78	9	26	21	52	1.64	....	16	3	11	5	N. E.
Dist. Res., D. C. [5]*	....	....	38 52	77 0	46.3	......	.....	75	9	25	29	50	2.13	....	....	....	...	...	.....
Rec. Res., D. C. [5]*	....	....	38 52	77 0	45.9	.....	.....	75	9	25	28	50	2.05	....	...	....	....	....	.....
Washington, D. C.	....	112	38 52	77 0	46.4	54.6	38.3	77	9	24	28	49	1.26	....	14	6	10	12	N.
Md. Agric't. Col. College Park.	Pr. George's	....	38 58	76 56	48.5	58.7	38.3	78	9	23	29	55	1.96	....	....	....	..	7	.....
Laurel	Pr. George's	....	39 5	76 45	44.5	54.0	35.5	75	8	23	28	52	1.55	....	...	....	....	...	.....
Upper Marlboro	Pr. George's	....	38 47	76 45	45.9	56.1	35.7	78	9	20	29	58	1.00	....	15	5	10	4	N.W.
La Plata	Charles	....	38 32	77 0	46.3	57.4	35.2	77	9	24	20,21,30	53	0.90	...	...	....	....	....	.....
Solomon's	Calvert	20	38 19	76 27	49.6	56.9	42.2	77	9	28	21	49	2.51	†	9	2	19	9	N.
Charlotte Hall	St. Mary's	....	38 28	76 48	46.0	55.9	36.2	78	9	22	29, 30	56	2.20	T	12	11	6	5	N.W.
Cherryfields [2]	St. Mary's	....	38 11	76 24	46.9	.....	.....	....	....	....	......	....	2.46	....	9	15	6	6	N.W.
Eastern Md. and Delaware.																			
Chestertown	Kent	80	39 13	76 4	45.8	54.7	37.0	75	8	25	22	50	2.22	....	16	4	10	5	S.
Denton	Caroline	42	38 47	75 41	.....	.....	.....	....	....	....	.....	....	......	...	...	....	....	....	.....
Easton	Talbot	35	38 42	76 6	47.2	55.8	38.6	77	9	25	22	52	2.56	....	10	9	11	4	N.W.
Cambridge	Dorchester	....	38 44	76 7	50.5	60.2	41.8	75	9	29	21, 22	56	2.57	....	10	11	9	8	N.W.
Mardela Springs	Wicomico	25	38 30	75 39	48 2	56.1	40.2	77	9	26	22	51	3.51	....	11	7	12	9	N. E.
Princess Anne	Somerset	....	38 10	75 35	48.4	58.6	38.1	78	7	23	22	55	2.07	....	11	7	12	7	N. E.
Pocomoke City	Worcester	37	38 5	75 34	52.8	62.4	43.2	77	9,26	29	22	48	2.50	....	11	9	10	10	N.
Wilmington, Del.	Newcastle	115	39 44	75 33	47.8	56.0	39.5	76	9	26	22	50	1.57	T	15	7	8	11	N.W.
Delaware College, Newark, Del.	Newcastle	....	39 40	75 37	45.1	54.0	36.2	75	9	20	22	55	1.06	....	13	2	15	7	N.W.
Dover, Del.	Kent	40	39 10	75 30	47.2	54.3	40.0	76	9	26	32	50	2.26	..	12	5	13	9	N.W.
Milford, Del	Kent	....	38 45	75 25	50.2	59.3	41.2	78	9	25	22	53	1.49	....	15	1	14	4	N.W.
Seaford, Del.	Sussex	....	38 40	75 35	48.4	57.5	39.3	75	7,9	25	22	50	2.60	....	....	....	...	...	.....
Millsboro, Del.	Sussex	....	38 44	75 15	48.8	57.3	40.4	77	9	23	22	54	2.66	...	14	6	10	8	N.
Pennsylvania.‡																			
Philadelphia		....	......	.. ...	4.70	53.8	40.1	74	9	26	22	48	2.32	0	11	6	13	12	N.W.
Virginia.‡																			
Birdsnest [1]*		...	......	......	59.0	......	......	80	9	32	21, 22	48	2.45	....	7	8	15	8	.....
Norfolk		....	......	......	54.0	60.0	47.9	80	9	28	21	52	3.41	....	11	7	12	12	N. E.
Warsaw		....	......	......	47.4	55.3	39.4	78	9	21	21	57	4.08	...	11	9	10	15	N.
Averages — Western Maryland		....	......	......	42.0	52.1	31.5	....	....	....	......	58.3	1.28	0.8	13.6	6.9	9.5	7.0	S.W. W.
Averages — Northern-Cent'l Md.		....	......	......	45.9	54.4	33.8	....	....	....	......	52.6	1.56	T	14.7	6.1	9.2	7.6	N.W.
Averages — Southern Maryland		....	......	......	46.7	55.6	38.0	..	....	...	......	51.3	1.70	T	12.4	6.0	11.4	7.4	N.W.
Averages — East. Md. and Del.		....	......	......	48.9	57.2	39.6	...	....	....	......	52.0	2.09	T	12.5	6.4	11.3	8.6	N.W.
Averages — Entire territory		....	......	......	45.9	54.8	33.2	....	....	....	......	53.6	1.41	0.2	13.3	6.4	10.5	7.6	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. + 9 p. m. ÷ 4. [2] Mean of 8 a. m. + 8 p. m. ÷ 2. [5] 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. ‡ Omitted in computing averages. †Received after report had gone to press and therefore omitted in computing averages and in preparing map.