

Virginia Tidewater Stations

Daily Maximum and Minimum temperatures for January, 1897.

VA State Records

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		Monthly Mean.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.										
TIDEWATER VA.																																																																
Ashland	60	29	58	29	63	43	70	53	61	40	37	25	44	14	40	18	54	19	59	33	55	28	44	26	28	19	34	27	36	30	38	27	50	31	53	35	42	19	29	22	56	34	53	32	48	29	56	32	25	15	35	17	24	19	24	11	37	6	36	2	40	10	45.0	24.6
Cape Henry	47	32	44	40	55	41	60	42	57	43	46	31	36	30	38	32	41	32	56	34	50	37	41	33	36	28	40	32	38	36	40	33	53	32	59	43	45	33	45	35	60	43	52	34	49	34	57	35	36	26	30	18	32	21	30	15	28	11	29	21	34	27	44.6	31.6
Doswell	59	23	53	23	53	32	68	54	52	42	33	28	32	11	38	18	47	12	52	32	52	22	40	23	30	22	33	28	35	30	42	30	50	29	42	40	30	45	45	24	55	35	52	33	43	29	52	30	22	13	31	6	22	19	19	13	21	3	32	5	30	9	41.1	23.6
Hampton	56	35	47	40	60	42	63	50	53	47	38	32	39	25	40	28	47	26	59	38	53	40	40	31	32	24	38	32	37	35	42	35	52	35	56	48	43	28	44	32	55	44	52	35	48	40	52	38	31	19	36	14	29	26	23	17	37	14	33	20	38	21	44.3	31.9
Norfolk	51	37	46	40	63	44	68	54	58	40	40	30	39	27	41	29	47	30	59	36	52	38	39	30	35	26	39	35	37	35	41	34	52	35	59	41	41	31	52	32	61	48	54	34	46	35	55	34	29	19	33	15	30	25	20	17	31	11	32	21	36	25	44.7	31.9
Petersburg	56	26	46	35	65	34	70	40	64	42	45	30	34	16	41	20	50	20	60	35	59	34	49	25	35	23	34	26	35	30	35	28	65	30	60	41	45	20	40	33	58	36	55	30	50	32	49	30	40	16	35	11	30	20	20	10	31	7	32	4	35	12	45.9	25.7
Richmond	45	28	50	30	61	42	65	44	55	40	33	29	35	15	37	20	47	22	56	34	50	32	36	29	28	20	35	28	36	31	38	28	45	32	53	37	40	21	40	23	50	35	50	35	48	32	50	31	25	15	28	10	25	20	17	12	30	8	31	4	35	12	41.1	25.8

Received March 8, 1897

U. S. DEPARTMENT OF AGRICULTURE.

REPORT FOR JANUARY, 1897.

VIRGINIA SECTION

OF THE

CLIMATE AND CROP SERVICE

OF THE

WEATHER BUREAU,

IN COOPERATION WITH THE

VIRGINIA STATE BOARD OF AGRICULTURE.

PREPARED UNDER THE DIRECTION OF

WILLIS L. MOORE,

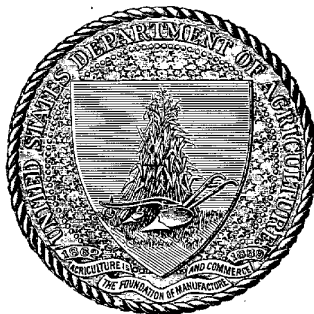
CHIEF OF BUREAU.

BY

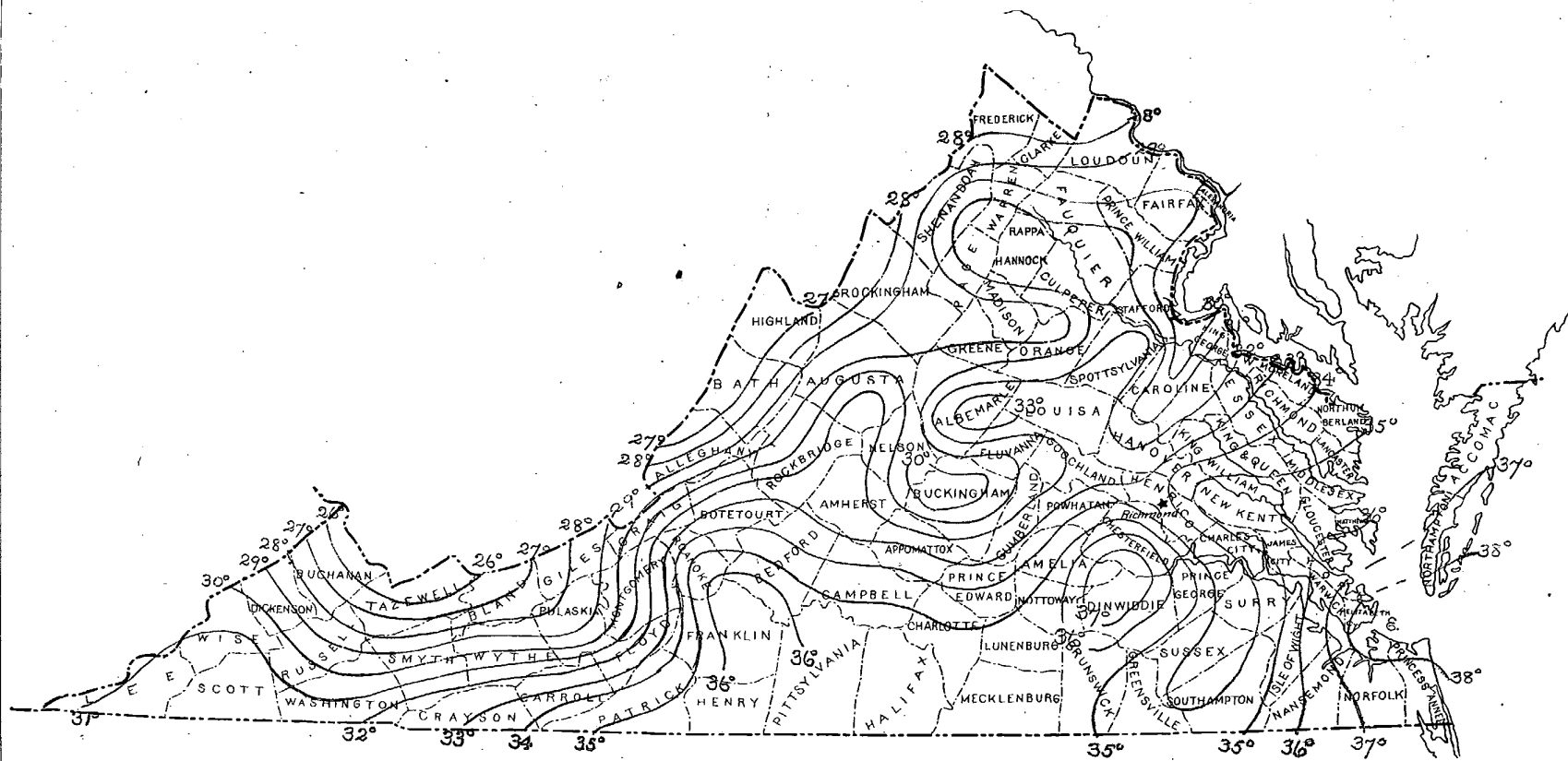
EDWARD A. EVANS

SECTION DIRECTOR,

RICHMOND, VA.



MONTHLY MEAN TEMPERATURE FOR JANUARY, 1897.



U. S. DEPARTMENT OF AGRICULTURE,
CLIMATE AND CROP SERVICE
 OF THE
WEATHER BUREAU.

IN COOPERATION WITH THE VIRGINIA STATE BOARD OF AGRICULTURE.

Central Office,
 WASHINGTON, D. C. }

WILLIS L. MOORE,
 Chief.

VIRGINIA SECTION,
 E. A. EVANS, Section Director,
 RICHMOND, VA.

VOL. VII.

RICHMOND, VA.

NO. 1.

THOMAS JEFFERSON AS A METEOROLOGIST.

— 0 —
 Concluded from last month.

In the following paragraph Jefferson alludes to the contemporary observations made at Monticello and Williamsburg, Va., some account of which has been given by Mr. McAdie:

It seems that Jefferson's cousin, Prof. James Madison, of William and Mary College, Williamsburg, Va., (afterwards Bishop Madison), had begun a systematic record of the barometer, thermometer, wind and rain, and Jefferson, in 1772, began a similar record at Monticello. The comparison of these records seems to have suggested the system of observation explained in the following extract from the letter dated January 1797, addressed to Mr. Volney, and published at page 341 of Vol. III of T. J. Randolph's Memoir, Correspondence, etc.:

I am sorry that you have received so little information on the subject of our winds. I had once (before our revolutionary war) a project on the same subject. As I had then an extensive acquaintance over this state I meant to have engaged some person in every county of it, giving them each a thermometer, to observe that and the winds twice a day for one year, to wit, at sunrise and at 4 p. m., (the coldest and the warmest point of the twenty four hours) and to communicate their observations to me at the end of the year. I should then have selected the days in which it appeared that the winds blew to a center within the state, and have made a map of them, and seen how far they had analogy with the temperature of the air. I meant this to be merely a specimen to be communicated to the Philosophical Society at Philadelphia, in order to engage them, by means of their correspondents to have the same thing done in every state, and through a series of years. By seizing the days when the winds centered in any part of the United States we might, in time, have come at some of the causes which determine the direction of the winds, which I suspect to be very various. But this long-winded project was prevented by the war which came upon us, and since that I have been far otherwise engaged.

During the past few years there have been several references in the WEATHER REVIEW to the subject of "frostless zones." It is a matter of course that observant farmers in dry climates, such as that of the United States, must always have been familiar with the phenomenon that the meteorologist calls the "inversion of temperature," occurring on still clear nights,

but it is interesting to find that Jefferson is the first American author who refers to the subject as in the following extract taken from his notes on the State of Virginia (see the Philadelphia edition of 1825, page 112):

The access of frost in the autumn and its recess in the spring do not seem to depend merely on the degree of cold, much less on the air being at the freezing point. White frosts are frequent when the thermometer is at 47°; have killed young plants of Indian corn at 48°, and has been known at 54°. Black frost, and even ice have been produced at 38 1-2°, which is 6 1-2° above the freezing point. That other circumstances must be combined with the cold to produce frost, is evident from this also; on the higher parts of mountains, where it is absolutely colder than in the plains on which they stand, frosts do not appear so early by a considerable space of time in autumn and go off sooner in the spring than in the plains. I have known frosts so severe as to kill the hickory trees round about Monticello, and yet not injure the tender fruit blossoms then in bloom on the top and higher parts of the mountain, and in the course of forty years, during which it has been settled, there have been but two instances of a general loss of fruit on it, while in the circumjacent country the fruit has escaped but twice in the last seven years. The plants of tobacco, which grow from the roots of those which have been cut off in the summer, are frequently green here at Christmas. This privilege against the frost is undoubtedly combined with the want of dew on the mountains. That the dew is very rare on their higher parts, I may say with certainty from twelve years observations, having scarcely ever, during that time, seen an unequivocal proof of its existence on them at all during summer. Severe frosts in the depth of winter prove that the region of dews extend higher in that season than the tops of mountains; but certainly, in the summer season, the vapors, by the time they attain that height are become so attenuated as not to subside, and form a dew when the sun retires.

One more extract from the notes on the State of Virginia showing Jefferson's close observation of the optical phenomenon known as "looming," which is frequent at sea but rare on land; but as Jefferson says:

At Monticello it is familiar. There is a solitary mountain about 40 miles off in the south, whose natural shape, as presented to view there, is a regular cone, but by the effect of looming it sometimes subsides almost totally in the horizon, sometimes it rises more acute and more elevated, sometimes it is hemispherical, and sometimes its sides are perpendicular, its top flat and as broad as its base. In short, it assumes at times the most whimsical shapes; and all these perhaps successively in the same morning. The Blue Ridge of mountains comes into view in the northeast at about 100 miles distance, and approaching in a direct line passes by within 20 miles and goes off to the southwest. This phenomenon begins to show itself on these mountains at about 50 miles distance and continues beyond that as far as they are seen. I remark no particular state, either in the weight, moisture, or heat of the atmosphere, necessary to produce this. The only constant circumstances are its appearance in the morning only, and on objects at least 40 or 50 miles distant. In this latter circumstance, if not in both, it differs from the looming on the water. Refraction will not account for the metamorphosis. That only changes the proportions of the length and breadth, base and altitude, preserving the general outlines. Thus it may make a circle appear elliptical, raise or depress a cone, but by none of its laws, as yet developed, will it make a circle appear a square, or a cone a sphere.

ATMOSPHERIC PRESSURE.

The mean monthly air pressure as deduced from the U. S. Weather Bureau Stations at Lynchburg, Norfolk and Washington D. C., was 30.21 inches; highest 30.75 inches, at Washington D. C., on the 31st; lowest 29.72 inches, at Washington D. C., on the 22d; range 1.03 inches.

TEMPERATURE (DEG. F)

TIDEWATER VIRGINIA.—Highest monthly mean, 38.3, at Norfolk; lowest monthly mean, 32.4, at Doswell; maximum temperature, 70, at Petersburg and Ashland, on the 4th; minimum temperature, 2, at Ashland, on the 30th; greatest daily range, 36, at Doswell.

MIDDLE VIRGINIA.—Highest monthly mean, 36.8, at Bon Air; lowest monthly mean, 30.0, at Buckingham and Quantico; maximum temperature, 69, at Bon Air and Nottoway C. H., on the 4th; minimum temperature, -5, at Guinea, on the 28th, Buckingham on the 29th, and Maidens and Nottoway C. H., on the 30th; greatest daily range, 43, at Nottoway C. H.

THE GREAT VALLEY.—Highest monthly mean, 36.0, at Salem; lowest monthly mean, 26.0, at Burke's Garden; maximum temperature, 67, at Big Stone Gap, on the 3d; minimum temperature, -15, at Bristol, on the 28th, and Big Stone Gap, on the 30th; greatest daily range, 47, at Wytheville.

FOR THE STATE.—Average of the monthly mean temperatures, 32.7; average of the maximum temperatures, 63; average of the minimum temperatures, 3; average of the greatest daily range, 31.

The month of January was colder than usual in this section. The mean temperatures 32.7 degrees, was 4.2 degrees below the normal for the month. The warmest period occurred during the first and second decades, and, as a rule, the weather was pleasant during this time, but in the last decade it was more or less stormy with much cold and considerable snow. The range of temperature, though large, was within the record. The 4th was the warmest day, maximums ranging from 60 to 70 degrees were recorded, and the 28-30th the coldest days with temperatures from 2 above zero in Tidewater counties to 15 below zero in the Great Valley. During this cold spell considerable ice made, and large quantities were harvested.

The damage to fall grain was not as great as in December, the ground being well covered with snow during the prevalence of the cold.

PRECIPITATION.

TIDEWATER VIRGINIA.—Greatest monthly precipitation, 3.15 inches, at Doswell; least monthly, 0.92 of an inch, at Cape Henry; greatest amount in any twenty-four consecutive hours 2.00 inches, at Doswell, on the 27th-28th.

MIDDLE VIRGINIA.—Greatest monthly precipitation, 5.00 inches, at Manassas; least monthly, 0.90 of an inch, at Buckingham; greatest amount in any twenty-four consecutive hours, 3.52 inches, at Manassas, on the 27th.

THE GREAT VALLEY.—Greatest monthly precipitation, 3.11 inches, at Big Stone Gap; least monthly, 0.90 of an inch, at Stanleyton; greatest amount in any twenty-four consecutive hours, 0.84 of an inch, at Blacksburg, on the 21st.

FOR THE STATE.—Average total precipitation, 1.94 inches.

The average total precipitation for the state, 1.94 inches, was 2.44 inches below the normal. By sections, the deficiency was greatest over Middle Virginia, excepting the counties bordering on the Potomac River. The amount was, however, fairly well distributed.

Snow was general over the state during the latter part of the month and occurred on several dates in the western and northern portions during the first fifteen days.

Crops received much benefit from the protection afforded thereby.

Fogs were general over the river valleys of the Tidewater section between the 1st and the 5th of the month.

The average number of days on which 0.01 of an inch or more of rain or snow fell, was 7 in Tidewater Virginia; 6 in Middle Virginia, and 6 in the Great Valley. Average for the State, 6.

WIND.—The prevailing direction of the wind in the different sections was as follows: Tidewater Virginia NW.; Middle Virginia, NW.; the Great Valley, W. Prevailing direction for the State, W., and NW.

WEATHER.—Tidewater Virginia, average number of clear days 14; partly cloudy, 6; cloudy, 11. Middle Virginia, average number of clear days, 16; partly cloudy, 7; cloudy, 8. The Great Valley, average number of clear days, 14; partly cloudy, 8; cloudy, 9. For the State, average number of clear days, 15; partly cloudy, 7; cloudy, 9.

NOTES AND COMMENTS.

All voluntary observers are requested to examine the published reports each month, particularly the table of "Climatological Data," and see if the data for their station agrees with their retained report, if any discrepancies are discovered, the retained form should be re-checked. This is quite important, and is, therefore, commended to the attention of the observers.

With the approach of spring it is desirable that the dates of frosts, with damage resulting therefrom, if any, be recorded. The date of the last killing and light frost of the spring, in each locality, is especially desired.

The following interesting bit of information is extracted from a letter received at the central office from our esteemed observer at Birdsnest, Mr. C. R. Moore, in reply to one from this office inquiring as to the elevation of his station.

"****There is a gravel ridge starting in Maryland and running south to Cape Charles. It is a moraine and was left by the ice (glacial) when it melted from over this land. All the creeks in the Chesapeake Bay shore have their mouths to the southward showing that they and the Chesapeake Bay were gouged out by the ice in its course to the ocean."

Mr. Moore has evidently given more than a casual thought to this matter.

Reports from Cape Charles, Bedford City, and Rural Retreat, not received.

The body of glacial ice is known to have been in the area.

Climatological Data for January, 1897.

Table with columns: Stations, Counties, Elevation, Length of record, TEMPERATURE (Mean, Departure from normal, Highest, Date, Lowest, Date, Greatest daily range), PRECIPITATION (Total, Departure from normal, Greatest in 24 hours, Total snowfall, Number of rainy days, Number clear days, Number partly cloudy days, Number cloudy days), SKY, Prevailing direction of wind, Observers.

+ Estimated. † Incomplete. tr. trace, or less than 0.1 or of an inch. (i) Means from 7 am, 2 and 9 + 9 pm, observations. Note— Estimated and incomplete data not considered in means.

MISCELLANEOUS PHENOMENA.

Fogs: Birdsnest, 2, 4, 15, 16; Spottsville, 1, 2, 15, 16; Bon Air, 16; Buckingham, 15, 16, 17; Hot Springs, 14, 15; Staunton, 15, 16; Stephen's City, 16; Woodstock, 16. Gales: Alexandria, 23; Buckingham, 11; Graham's Forge, 11, 12. Hail: Birdsnest, 27, 28; Petersburg, 13; Spottsville, 27; Sunbeam, 27, 28; Buckingham, 20; Callaville, 27; Fredericks-

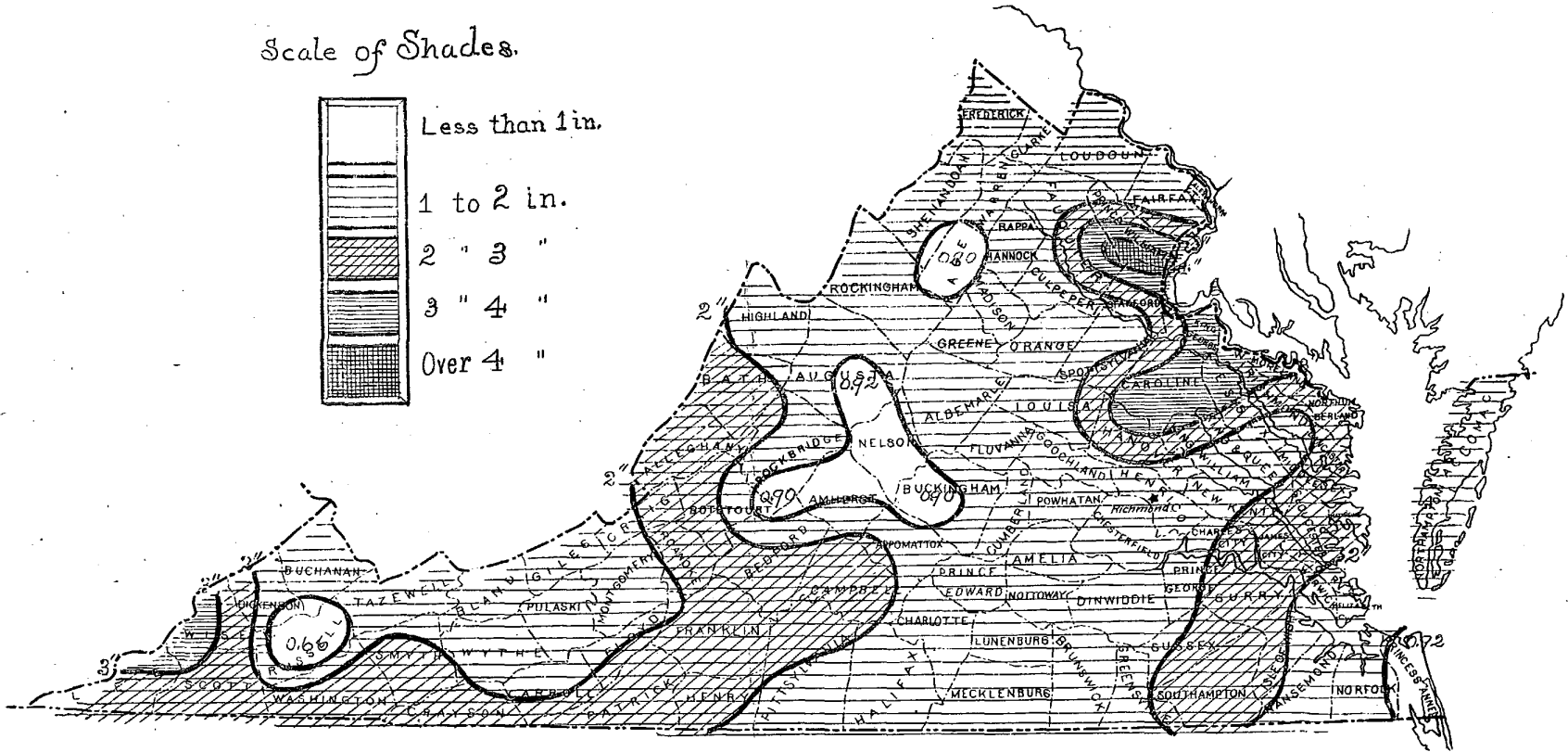
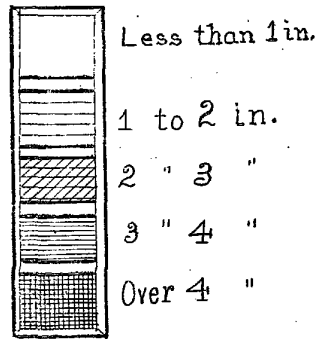
burg, 1, 2, 17; Quantico, 17; Stanardsville, 17; Clifton Forge, 17. Halos, Lunar: Petersburg, 8; Spottsville, 7, 9; Wytheville, 9. Halos, Solar: Spottsville, 7, 25. Lightning: Petersburg, 2. Sleet: Sunbeam, 27; Alexandria, 14; Barboursville, 13, 14, 17, 20; Fredericksburg, 15; Stanardsville, 17; Dale Enterprise, 13, 20; Hot Springs, 17, 20; Lexington, 17, 20; Staunton, 13, 17, 20; Stephens City, 17; Sword's Creek, 13, 14; Woodstock, 14, 17, 20; Wytheville, 20.

Daily Maximum and Minimum temperatures for January, 1897.

Table with columns for Stations, 1-31, and Monthly Mean. Rows are grouped by region: TIDEWATER VA., MIDDLE VA., and GREAT VALLEY. Each station lists Max and Min temperatures for each day of the month.

TOTAL PRECIPITATION FOR JANUARY, 1897.

Scale of Shades.



Daily Precipitation for January, 1897.

Stations.	Day of Month.																															Total.			
	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				
TIDEWATER VIRGINIA.																																			
Ashland					.04								tr	.15	.07		.10			.02	.94											.20		1.52	
Birdsnest											.10			.25	.15		.25			.55											.50		1.80		
Cape Henry													.10	.25			.02	.01		.10	.08										.35	.01	0.92		
Doswell													.15							1.00													2.00		3.15
Hampton			.02								.01		.10	.41	.01		.10	.04			.67										.10	.47		1.87	
Norfolk			.02		tr	tr					tr		.09	.40	.01		.05	.04		.08	.30										.42	.06		1.47	
Petersburg						.06					tr		.02	.20			.29			.03	1.00										.30	.06		1.96	
Spottsville					tr							.20				.59			.84	.15												.30		2.22	
Sunbeam											tr		.10	.41			tr			.10	.86										.20	.55		2.22	
Warsaw														.15					.51		.98											.35		1.99	
MIDDLE VIRGINIA.																																			
Alexandria						.17					tr	tr	.07	.06	tr		.14			1.14				tr						.25			1.83		
Barboursville				.06		.09							.03	.03			.14	tr		.30	.76									.29	.06		1.76		
Bedford City															.17	.01			.12		1.10										.50		1.90		
Bon Air															tr	tr			.45		.45				tr									0.90	
Buckingham				tr	tr									.18					.44		.44	.41									.37	.08		0.95	
Callsville											.03								.21	.25	.90										.35	.10		2.02	
Charlottesville					.13										tr	.07			.08	.02	.18	.84			tr							.40		1.70	
Fredericksburg			.01		tr	.05									tr	.09	.03															.60		0.72	
Gordonsville					tr										.02	tr																			0.72
Guinea														.20																	.30	.10		3.60	
Lynchburg						.17	.02					tr	.07	.08	.05		.25	.05		.51	.54										.43	.02		2.19	
Maidens						.05							.07	.08		.26			.92												.35			1.65	
Mammasus		.02				.27							.05			.15			.10	.91											.35	.52		5.00	
Nottoway C. H.						.05							.05	.12	.03		.28	.05		.04	1.14									.38	.03		1.90		
Quantico													.10				tr															.52			0.62
Rocky Mount					tr	tr							.62	tr		.15	tr		.40	.74											.30	tr		2.21	
Smithville																.20				tr	.92											.55			1.87
Stamardsville						tr											.38				.15	.75									.60			1.88	
THE GREAT VALLEY.																																			
Big Stone Gap					.73						tr			.78	.35			.53	tr		.43	.09	tr		tr	tr				.20				3.11	
Blacksburg					.30		.04							.40	.03					.84											.04			2.65	
Bristol					.23	tr					tr		.20	.45	.13		.28			.36	tr				.02		.20	.50						1.37	
Burke's Garden					.46									.30																		.40			1.16
Christiansburg						.15									.25	.02		.11	.12		.05	.05									.21	.03		1.59	
Clifton Forge					1.00							tr		.05	tr		.30			.70											.30			2.35	
Dale Enterprise					.21							tr	tr	.04			.20	tr		.71											.40			1.56	
Goshen																			.50												.40			0.90	
Graham's Forge					.26	tr							.38				.16	tr		.72	tr			tr							.28			1.80	
Hot Springs					.72	tr						tr	.10	.05			.25	tr		.63	tr										.40			2.15	
Lexington					.35								tr	.02	.01	tr		.31		.25	.57	.17								.33			1.76		
Marton					.20	tr								.40	.80																			2.40	
Monteary					.40												.35	.10		.28	.35										.20			1.92	
Salem					.20												.17															.07	.34		1.69
Saltville					.17	tr	tr							.50	.29			.11	tr		.38	.05									.17			1.67	
Stanleyton																	tr	tr		.07												.30	.14		0.90
Staunton					.27								tr	tr	tr	tr	.02		.18		.28											.17			0.92
Stephens City					tr	.23							tr	tr	tr	tr		.74		.35	.35			tr							.53			1.85	
Sword's Creek													tr	tr	tr	tr																.35			0.66
Woodstock						.34							tr	tr	.02	.08		.14	tr		.68										.20			1.46	
Wytheville			tr		.01	.12	tr														.72										.17			1.43	

† Rainfall estimated. tr. Trace, or less than .01 of an inch.

OBSERVERS' NOTES.

Ashland.—High winds all night of the 22d. On the 27th, snow fell all day and until early morning of the 28th.

Birdsnest.—Average temperature for January, 23 years 40.1; highest 50.0, in 1890; lowest 33.7, in 1881. Average rainfall for January, 23 years 3.78 inches. Greatest, 6.75 inches in 1882; least 1.00 inch in 1876.

Sunbeam.—Considerable snow in places here and there on 31st.

Spottsville.—Period of small daily range 13th to 16th. Cold snap 25th to 29th. Hail on 27th changing to snow in the evening. Month mostly pleasant.

Barboursville.—Saw many dandelions in bloom on 3d and 4th. Heavy fog late in afternoon of 16th. On the 17th and 18th wind very severe from 10 p.m. to 11 p.m.

Fredericksburg.—High wind on night of 17th. Ice 3 inches thick. River frozen and navigation closed on 27th.

Bristol.—Sudden fall of temperature on the 24th. Heavy snow night of 26th.

Clifton Forge.—High west wind with light snowfall on 11th, remained on ground about 2 hours after sunrise; was followed by drizzling rain, and continued at intervals about 12 hours. Heavy frost noticed at 3 a.m. of the 16th.

Staunton.—Wheat has not suffered so much from freezing as might be expected, owing to the dry condition of the ground. Most of the plowing has been finished for spring crops.

Dale Enterprise.—Ice harvesters very busy, and skaters all a-glee from 25th to the close of month. Some sleighing on the 27th and 28th.

Lexington.—Ice 3.5 thick was cut from North river on 30th.