

portunity permitted, and by the middle of the second decade most of it was in the fields. Good "seasons" obtained for this work and the plants made excellent growth. Pastures were in fine condition throughout the month.

JULY.—Warm, sunny days, with frequent and generally well-distributed showers, combined to make excellent growing weather, and crops and all classes of farm work progressed steadily. Cultivation, especially, which was much behindhand on account of the abundant moisture of June, was vigorously prosecuted. By the end of the month a large acreage of corn had been laid by. Haying was also carried on and nearly completed, a fine crop being secured. The month saw the wheat and oats harvest practically completed in all portions of the State and the crop shocked or stacked and hauling to barns and threshing under way. Yields of wheat were generally disappointing, except as to straw. Oats, though short in straw and not previously promising, made a better crop than was anticipated. Tobacco made uniformly good progress, though that planted in bottom lands was late owing to the heavy rains of the preceding month. Some fields came in top toward the latter part of the month. The peach and apple crops were unfavorably reported upon.

AUGUST.—There was too much moisture and cloudiness during the month for best results either in crop growth and maturity or farm work. The soil was thoroughly saturated all the time, retarding plowing and other preparation for fall seeding, while other classes of work, except threshing of wheat and oats, were nearly at a standstill. During the latter part of the month, however, the conditions were more favorable, and the sowing of fodder and cutting of tobacco were vigorously prosecuted. The tobacco crop, on the whole, passed through the month very well. Late corn in lowlands received some setbacks from heavy rains. Of the fruit crop, plums and damsons were plentiful and good, peaches fair and apples, both summer and fall varieties, in poor condition.

SEPTEMBER.—The weather during September was in nearly all respects quite favorable for the growth and maturing of the various crops as well as for all kinds of farm work. Fodder pulling continued until about the 15th, when a plentiful supply of well-cured blades was saved in most sections. Tobacco cutting progressed rapidly, and the bulk of the crop was secured during this period. The late-planted ripened well, and in most sections made an average crop, but in a few localities the yield was light and the quality poor and chaffy. Little or no damage was done by insects, and the crop was housed in good condition and cured well. Corn had about matured by the middle of the month, but some of the late-planted was still green at its close. Cutting continued, and with the exception of the late fields was completed by the end of the month. In some of the Tidewater counties the yield will hardly reach expectations, but throughout the Middle and Valley counties a yield above the average was indicated. Peanuts made a good growth of vine, but the yield of nuts was variable. Apples continued in poor condition throughout the State. Sweet potatoes made good growth, especially in the Tidewater division, but the second crop of Irish potatoes did not fully recover from the injurious effects of the long-continued rains of August and considerable rotting in the ground occurred. Pasturage was plentiful. Fall plowing was carried on under favorable circumstances from the 15th, and much winter grain was sown by the close of the month.

The issue of the Weekly Crop Bulletin for the season was suspended on the 17th.

KILLING FROSTS.

Table of Dates of Last Killing Frost in the Spring and the First Killing Frost in the Autumn.

Station.	Last killing frost in Spring.	First killing frost in Autumn.	Station.	Last killing frost in Spring.	First killing frost in Autumn.
TIDEWATER VIRGINIA.			MIDDLE VIRGINIA—Continued.		
Ashland	Mar. 29	Oct. 25	Fredricksburg	Mar. 29	Oct. 21
Birdsnest	Mar. 8	Nov. 16	Lincola	Apr. 12	Oct. 7
Cape Henry	Mar. 28	Nov. 16	Lynchburg	Mar. 18	Oct. 25
Doswell	Apr. 12	Oct. 10	Musascus	Apr. 2	Oct. 2
Hampton	Mar. 7	Nov. 16	Quantico	Apr. 5	Nov. 6
Newport News	Mar. 7	Nov. 20	Stannardsville	Apr. 13	Oct. 25
Norfolk	Mar. 8	Nov. 16	Washington	Mar. 17	Oct. 25
Petersburg	Mar. 29	Oct. 25			
Richmond	Mar. 17	Nov. 16	THE GREAT VALLEY.		
Spottsville (near)	Apr. 12	Oct. 2	Big Stone Gap	Apr. 24	Oct. 4
Warsaw	Mar. 18	Oct. 25	Blacksburg	Apr. 12	Oct. 4
West Point	Apr. 16	Nov. 9	Bristol	Apr. 23	Oct. 14
Williamsburg	Mar. 18	Nov. 17	Burkes Garden	Apr. 29	Sept. 21
MIDDLE VIRGINIA.			Clifton Forge	May 6	Oct. 24
Alexandria	Mar. 18	Oct. 8	Date Enterprise	Apr. 15	Sept. 20
Barbourville	Mar. 18	Oct. 25	Grahams Forge	Apr. 28	Oct. 1
Bedford City	Mar. 21	Nov. 18	Hot Springs	Apr. 27	Oct. 3
Bon Air	Mar. 29	Oct. 21	Lexington	Apr. 12	Oct. 25
Buckingham	Apr. 11	Oct. 25	Marion	Apr. 28	Oct. 1
Callaville	Mar. 29	Oct. 21	Rosaoke	Apr. 28	Oct. 5
Charlottesville	Mar. 12	Oct. 12	Staunton	Apr. 12	Oct. 30
Columbia	Apr. 28	Oct. 25	Stevens City	Apr. 3	Oct. 29
Farmville	Mar. 29	Oct. 25	Woodstock	Apr. 12	Oct. 1
Fontella	Mar. 22	Oct. 25	Wytheville	Apr. 12	Oct. 8

GENERAL SUMMARY FOR THE YEAR 1901.

JANUARY was characterized by a large number of bright, pleasant days. There was much mild weather, a smaller percentage of cloudiness than is usual, and a few days when the atmosphere was crisp and bracing. In fact, the conditions were rather those of late fall than midwinter. As a rule the maximum temperatures were observed between the 9th and 16th and ranged between 55 and 70 degrees. Over the State as a whole the minimum temperatures were higher than usual, though some cold weather was experienced at elevated stations in the Valley division during the last decade of the month. Precipitation was generally and decidedly deficient except in the Valley counties, where a moderate excess as compared with the normal occurred. Considered in relation to crop needs, it appears to have been sufficient. Snow occurred on several dates, but was light and disappeared rapidly. Fogs were frequent. Thunderstorms occurred on the 24th locally. Prevailing wind direction, NW.

FEBRUARY, though having no periods of unusually cold weather, was yet decidedly below the normal, owing to the prevalence of temperature conditions ranging 5 or more degrees below the average during the major portion of the month. The general rule that February gives the coldest weather of the year remained unbroken for the current month. Both its minimum and mean temperatures were the lowest of the winter. Compared with the same month of the three preceding years, the deficiency, 5.3 degrees, is the same as that of 1900, less than in 1899 and slightly more than in 1898. The minimum extremes, however, were not as great as those observed in the same preceding period, the lowest temperature reported being but 1 degree below zero, while in the other Februaries noted they ranged from 7 to 29 degrees below. On the other hand, the maximum extremes were from 4 to 9 degrees less. It will thus be seen that, while it was colder than normally, its temperature fluctuations ranged within more narrow limits than in the same month of the years above noted. The average precipitation occurring, 0.75 inch, was 3.08 inches below the normal. This is the least

monthly amount recorded since the organization of the Climate and Crop Service in 1892. With the exception of three days, the 3d, 8th and 9th, all precipitation was of a local nature, while in every instance the amounts deposited were light except on the 3d, when they were moderate. Some snow fell, but it was generally light, melted quickly and was inadequate for thorough crop protection.

Prevailing wind direction, NW.

MARCH, in respect to its mean temperature, was 3 degrees warmer than normally. Notwithstanding a period of unseasonably cold, blustery weather, the days were for the most part bright and pleasant. During the first decade the temperatures were about normal, except on the 6th and 7th, when they fell sharply, resulting in the coldest weather of the month, during which readings of from freezing down to 3 degrees below zero were recorded. The warmest weather of the month occurred at a majority of the stations on the 18-19th. The period 24-26th was also warm, and a number of stations reported their monthly maximums on one or the other of these dates. Frosts were frequent, but caused no damage, as fruit bloom and tender vegetation were not sufficiently forward to be subject to injury. The droughty conditions previously prevailing during the year gave way in this month, and ample moisture was had. In the first fifteen days precipitation was general, and in the latter half of the month there were several periods of general rain, together with numerous local showers (thunderstorms), which occurred over extended areas. The greatest daily rainfalls reported occurred for the most part on the 11th and 26th. Snow fell on the 5th in nearly all portions of the State, and on the 6th, 7th, 11th, 14th and 15th locally. There were no flood rises. Fogs occurred on various dates.

Prevailing wind direction, W.

APRIL was a cold month, and had less than the normal amount of sunshine. Its mean temperature, 50.0 degrees, was 4.6 degrees below average. Compared with the same month of the three preceding years, it was colder by from 1.4 to 4.7 degrees. It opened with seasonable temperatures prevailing, but owing to unusual cloudiness no increase in warmth was had as the month advanced until near the closing days, when the sky cleared and a period of bright, warm weather set in. During a great part of the month the daily range of temperature was small. The maximum readings were generally recorded on the 30th, and the minimum on various dates between the 1st and 23d. Killing frost occurred early in the month and light frosts about the 23d. The damage resulting was slight, the advance of vegetation having been retarded by the cool weather. Precipitation was general over the State in moderate to heavy amounts on eight days and local on eleven other days. Light snow occurred in portions of Middle Virginia on the 3d, and light to heavy snow in the Great Valley between the 21st and 23d, reaching, in some localities, depths unusual for the season. The rains of the 14th caused a moderate flood rise, the maximum height of which was, locally, 10.6 feet. On the 21-22d a more important freshet occurred, during which the river reached stages of 22 feet at Columbia and 14.5 at Richmond. Warnings for each of these floods were issued from 24 to 36 hours in advance, and no damage ensued.

Prevailing wind direction, NW.

MAY cloudiness was in excess, and the month was also cooler than normally, the departure being -1.5 degrees. The lowest temperatures observed occurred generally during the first decade, the 3d to 5th being the predominating dates. It was also cool on the 14th, a number of stations reporting their monthly minimum on that date. The warmest days were the 1st, 2d and 24th. As a rule, the maximum tempera-

tures ranged between 80 and 90 degrees, though some stations recorded as high as 95. This, however, was less than the May record of the three preceding years by from 3 to 5 degrees. The month was rainy, especially in the Middle and Great Valley sections. Both amounts of rain and number of rainy days were excessive. On the 22d heavy rain occurred over the State. The fall was unusually great in the central portions of the Blue Ridge, especially along their eastern face from Buckingham to Greene counties, where 24-hour amounts from 5 to 6 inches were noted. The amount of water carried by the various streams of the State was considerably augmented during the entire month, but flood water did not prevail until the 22-23d, when many of them went over their banks and great damage done to lowland crops, fencing, buildings, etc., besides much stock drowned. Average rainfall for the State, 5.49 inches. Thunderstorms were frequent and severe.

Prevailing wind direction, W.

JUNE, in respect to temperature, presented some marked contrasts, it being cooler than normally during a portion of the first decade, and much warmer from the 27th to its close. The range for the State, deduced from the highest and lowest readings reported, was 63 degrees. The monthly minima occurred between the 1st-10th and the monthly maxima on either the 29th or 30th, when the thermometer readings ranged from 90 to 103 degrees. This, coming so suddenly after the long period of cool, spring weather, was productive of much suffering among all classes of citizens, and heat prostrations, several of which resulted fatally, were numerous. Considerable humidity was attendant upon the hot wave, which much increased its discomforts. As in the preceding month, the average rainfall throughout the State was above normal, and in some instances excessively so, several stations reporting a monthly total of from 10.60 to 14.37 inches. On the other hand, there were localities in the eastern portion where the monthly totals were normal or slightly below. A phenomenal 24-hour rainfall occurred at Columbia on the 6-7th, the amount being 7.60 inches. In the southwest Valley, where the average rainfall was greatest, numerous freshets occurred, resulting in great damage to railroad trackage, roadbeds and rolling stock, also to farm property, fencing, barns, crops, stock, etc. In the James river a freshet of moderate proportions occurred, warning of which was issued. It passed off without material damage.

Prevailing wind direction, S.

JULY mean temperature was 1.3 degrees above normal. The heated term of the latter part of June continued into this month with unabated intensity. Throughout the State, on the 1st, the maximum temperatures recorded ranged from 96 to 106 degrees, and were comparable in all respects with those obtaining for the same month last year—a year having one of the hottest summers on record. This excessive heat, however, was not protracted, there being a tendency towards a reaction on the 4th, which was in full force by the 8th, between which date and the 11th the coolest weather of the month occurred. After the 11th and continuing until the 29th, seasonable temperature conditions prevailed. On the latter date the temperatures again rose, and the month closed as it had opened, with a heated term. Precipitation occurring over the State was decidedly above the normal in the Middle division, the excess being sufficient to raise the monthly State average above normal, although the Tidewater and Valley sections had less than the normal quantity, and in the southwest Valley the conditions were droughty. The dates of heaviest and most general rains were the 6th, 8th, 13th, 14th and 31st. On all other days, of which there were about twenty, the rainfall was light and local. The heaviest monthly amounts recorded

ranged from 7.26 to 9.82 inches. No fresh stages occurred in the James river.

Prevailing wind direction, S.

AUGUST temperatures were remarkably uniform, and with but few exceptions ranged within moderate limits in all sections of the State. The mean temperature for the month was 74.7 degrees. The highest reported temperature was 98 degrees, occurring at only two stations, one in the Middle section on the 5th and the other in the Valley section on the 9th and 11th. Days with maximums of 90 or more degrees were few. The causes tending to produce this were a more than ordinary condition of cloudiness and moisture. The rainfall for the month was phenomenal in the southern half of the State and heavy elsewhere, except in the extreme northern counties and over the Eastern Shore, where it was about normal. In all counties south of a line approximately following the James river the precipitation ranged from 7 to over 17 inches, or from three to thirteen-and-a-half inches more than that ordinarily occurring. Fourteen stations reported ten or more inches in the monthly fall. There were also some notable 24-hour amounts recorded, particularly at Buckingham, where 5.55 fell within this time, constituting the greatest rainfall for a day that has occurred in the State within recent years, so far as the records show. There were four well-defined rainy periods, each embracing two or three days, while days with local rains almost filled up the measure of the month. The number of thunderstorms was less than usual. Flood water prevailed in several of the streams of the State. Warnings were issued for the James river on the 6th and 15th inst., each of which was verified by a subsequent rise to about the height expected.

Prevailing wind direction, S.

SEPTEMBER had a mean temperature of 67.2 degrees, which was 2.7 degrees below normal. The conditions were not noteworthy, except possibly for uniform mildness. Seasonable temperatures prevailed up to about the middle of the month, when a short period of what might be termed warm weather set in, the maximum recorded being 90 or more degrees east of the Blue Ridge. Immediately following this, and continuing until near the close of the month, occurred the coolest period of the month, and light frosts occurred in localities in the Valley division. Generally, normal conditions in respect to precipitation obtained, although locally in Tidewater and Middle divisions marked excesses occurred, while at other points in the Middle division and in some parts of the Valley there was a decided deficiency. The greater portion of the rainfall occurring fell during two periods, viz., the 17th to 19th inclusive, and the 28th and 29th. In the southeast section of the State and over a small area in the central portion, including Buckingham county, the monthly totals exceeded 5 inches.

Prevailing wind direction, NE.

OCTOBER was a rarely bright and beautiful month. Its mean temperature was 56.5 degrees, or about normal. Beginning with the 1st and continuing till the closing days, the weather was, with but few exceptions, mild and sunny. For the most part, the temperatures ranged between normal limits, though there were some cool days early in the first decade, when light frosts were common in all portions of the State except the coast districts, and again about the 25th, when light to killing frosts occurred. Maximum temperatures were generally had on the 23d. In the matter of clear days, the number recorded, 22, largely exceeded those of any October during the past ten years, except for 1892 and 1895, and these it exceeded slightly. Precipitation was decidedly lacking. Over by far a major part of the State the amounts deposited were less than an inch, and in some counties in the northern part were under one-quarter of an inch. There was

only one station reporting a nearly normal amount. Fogs were frequent in the early morning in lowlands and along water-courses, and occasional fogs occurred after sunset. The volume of water in the various rivers was much reduced by the dry weather.

Prevailing wind direction, W.

NOVEMBER mean temperature, 41.2 degrees, was 5.6 degrees below normal. There were, however, no periods of especially cold weather, the deficiency noted resulting from a nearly constant condition of temperatures slightly below the average. As in October, there were many bright, sunny days. The highest temperatures recorded ranged from 64 to 84 degrees, occurring for the most part early in the first decade, while the lowest temperatures were observed on various dates between the 19th and 29th, the readings being from 11 to 28 degrees. The month was from 3.4 to 8.7 degrees colder than any November in the preceding three years, and killing frosts were frequent in all portions of the State. Precipitation was again decidedly deficient, being 1.31 inches below normal. There were but three days with general rains, and on two of these, the 23d and 24th, the major part of the monthly amount received occurred. The first snow of the season occurred in the Valley section on the 14th. There was some increase in the volume of water carried by the James river, consequent upon the rains of the 23-24th, but it was not sufficient to call for the issue of flood warnings. Fogs were prevalent in the early morning in the lowlands.

Prevailing wind direction, NW.

DECEMBER, like the four preceding months, had a mean temperature below normal, the departure being 4.0 degrees on a monthly mean of 35.7 degrees. Nearly average conditions prevailed until the 15th, when the weather became cold and night temperatures of from 4 degrees in Tidewater to -14 degrees in the Great Valley were recorded, the latter constituting the lowest reading for December since the work of the Climate and Crop Section was begun. The latter half of the first decade was also marked by some cold weather. Mild weather was had from the 1st to 3d, 8th to 14th and 24th to 27th, during which the highest December temperature since 1895, 75 degrees, was observed. Precipitation was heavy and, in the main, general over the State, coming for the most part in the form of rain. In Tidewater and Valley sections the number of rainy days was somewhat greater than in the Middle section. The monthly amounts deposited were generally largely in excess of the normal, and, as compared with those of December of previous years of which there is record, are found to be the greatest by from 3 to 5 inches. Thirteen days with general and heavy rains prevailed, and seven on which it was light and rather local in character. Flood water in the James river resulted from the precipitation of the 14-15th, and again from that of the 28-29th. The latter attained disastrous proportions from Lynchburg eastward, and was notably severe at Richmond, where much damage was done. Maximum stages of 21.2 feet, 34.3 feet and 23.2 feet occurred at Lynchburg, Columbia and Richmond, respectively. The usual warnings were issued by the Bureau in each case.

Prevailing wind direction, W.

ERRATA, ANNUAL REPORT, 1900.—Alexandria, annual precipitation, 39.33, should be 39.35; Barboursville, annual precipitation, 38.02, should be 38.05; Big Stone Gap, annual precipitation, 48.91, should be 48.90; Manassas, annual temperature, 56.4, should be 56.5; Petersburg, annual precipitation, 43.71, should be 41.71. Farmville, total precipitation for December, 4.10, should be 4.00; Graham's Forge, total precipitation for August, 0.57, should be 0.51; Manassas, mean temperature for April, 52.0, should be 53.6; Stanardsville, total precipitation for June, 6.07, should be 5.87.